

円周率 800 万桁

及 $\sqrt{2}$

$\frac{1}{\sqrt{2}}$, $\sqrt{2}$ 1600 万桁の検定・統計結果

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1. はじめに

$\sqrt{2}$, π , e などの無理数、超越数の高精度計算法並にこれらを小数形式で表わした時の各数字の規則性について、多くの関心が払われてきている。このため、 $\frac{1}{\sqrt{2}}$, π を 2^{24} 桁まで計算する機会がある。これらの検定済の π の小数点以下 800 万桁の値と、 $\frac{1}{\sqrt{2}}$ 及び $\sqrt{2}$ の 1600 万桁の値のそれぞれについて検定を行なうので、ここに報告する。(それぞれの値は 10 進表現である。円周率 400 万桁についての検定結果は、すでに文献 [1] に示してあるので、参照されたい。 $\sqrt{2}$ に関する今までの統計結果については、文献 [2] からの繰引きが参考になる。)

今回の使用検定方法は、円周率 1 万桁 [3]、200 万桁 [4] の値の検定に使用されたもの (Frequency test, Serial test, Poker hand test, Gap test, Five-digit sum test)

と同じものがある。連続する同じ数の出現頻度、昇べき順、降べき順に並ぶ数値の出現頻度も合わせて調べた。

検定・統計結果を以下に示す。それらをどうとらえるかは、今後の課題である。しかしながら、「高精度数学定数 ($\pi, e, \sqrt{2}, \frac{1}{\sqrt{2}}, \dots$ 等) を乱数として使用できる可能性がゼロでない」とみるのは、考えがまてあろうか？

尚、検定のプログラムとしては、文献[3]で使用されたものを流用させていた。ここに筑波大学の三好和憲博士に感謝いたします。

2. Frequency summary, Frequency test

π 800万桁

*** FREQUENCY SUMMARY ***												
DIGIT	0	1	2	3	4	5	6	7	8	9 CHI-SQ.		
TO 1000	8	8	12	11	10	8	9	8	12	141	4.20	
TO 2000	19	20	24	19	22	20	16	12	25	231	6.80	
TO 5000	45	59	54	50	53	50	48	36	53	521	6.88	
TO 10000	93	116	103	102	93	97	94	95	101	1061	4.74	
TO 20000	182	212	207	188	195	205	200	197	202	2121	4.34	
TO 50000	466	532	496	459	508	525	513	488	492	5211	10.77	
TO 100000	968	1026	1021	974	1012	1046	1021	970	948	10141	9.32	
TO 200000	1954	1997	1986	1986	2043	2082	2017	1953	1962	20201	7.72	
TO 500000	5033	5055	4867	4947	5011	5052	5018	4977	5030	50101	5.86	
TO 1000000	9999	10137	9908	10025	9971	10026	10029	10025	9978	99021	4.09	
TO 2000000	20104	20063	19892	20010	19874	20199	19898	20163	19956	198411	7.31	
TO 5000000	49915	49984	49753	50000	50357	50235	49824	50230	49911	497911	7.73	
TO 10000000	99959	99758	100026	100229	100230	100359	99548	99800	99985	1001061	5.51	
TO 20000000	199792	199535	200077	200141	200083	200521	199403	200310	199447	2006911	9.00	
TO 40000000	399419	399463	399822	399913	400792	400032	399032	400650	400183	4006941	7.92	
TO 50000000	499620	499898	499508	499933	500544	500025	498758	500880	499880	5009541	7.88	
TO 80000000	799111	800110	799788	800234	800202	800154	798885	800560	800638	8003181	3.79	

*** FREQUENCY TEST ***											
DIGIT	0	1	2	3	4	5	6	7	8	9 CHI-SQ.	
BLK 1	79949	79851	79872	79962	80447	80298	79650	79884	80167	799201	6.27
BLK 2	79863	79770	80311	79946	79504	80298	79854	80400	79664	803901	11.91
BLK 3	79915	79788	79974	80093	80491	80030	79921	80198	79410	801801	9.12
BLK 4	79836	80137	79722	80419	79688	79719	80037	80125	80431	798861	8.63
BLK 5	79856	79917	79943	79493	80662	79687	79570	80043	80511	803181	17.16
BLK 6	80344	80525	79699	80043	79752	79959	79562	80041	79860	802151	10.11
BLK 7	79799	80013	80068	80281	79542	80034	79966	80269	80094	799341	5.27
BLK 8	79904	80312	80200	79599	80285	79918	79893	79862	80119	799081	5.61
BLK 9	79758	80165	79985	80815	79875	80085	79945	79586	80205	795811	14.56
BLK10	79887	79632	80014	79583	79956	80126	80487	80152	80177	799861	7.90
TOTAL	799111	800110	799788	800234	800202	800154	798885	800560	800638	8003181	3.79

$\frac{1}{\sqrt{2}}$ 1600 万桁

*** FREQUENCY SUMMARY ***

DIGIT	0	1	2	3	4	5	6	7	8	9	91CHI-SQ.
TO 1000	9	8	7	14	11	8	11	9	14	91	5.40
TO 2000	18	17	18	24	17	20	25	21	20	201	3.40
TO 5000	46	49	46	52	49	52	49	55	49	531	1.56
TO 10000	104	96	108	102	109	102	95	96	92	961	3.06
TO 20000	193	197	202	201	220	175	203	203	206	2001	5.71
TO 50000	474	486	503	511	528	472	506	494	495	5311	7.26
TO 100000	973	998	1015	1025	1018	982	986	1002	971	10281	3.95
TO 200000	2025	1982	2022	2008	2031	1948	1988	2035	1942	20211	5.10
TO 500000	5077	4931	5049	4928	5008	4918	5021	5064	5035	49691	6.36
TO 1000000	10021	9863	10077	9913	10007	10044	10071	10025	10034	99451	4.45
TO 2000000	20033	19741	20246	19980	20086	19771	20130	20089	19957	199671	10.83
TO 5000000	49967	49903	50083	50053	49896	49432	50286	50298	49999	500831	10.62
TO 10000000	99600	100210	100290	100269	100232	99138	100417	99889	99625	1003301	15.93
TO 20000000	199747	200164	200410	201033	200051	198574	199977	200023	199788	2002331	17.31
TO 40000000	399526	400672	399775	401273	399996	399057	399911	399562	400235	3999951	8.73
TO 50000000	499530	500452	499712	501083	500349	499186	500089	499614	500358	4996271	5.78
TO 80000000	799762	799993	799722	800910	800488	799615	799770	800119	800180	7994411	2.20
TO 100000000	1000029	1000204	999643	1000333	1000720	999982	999678	999841	1000272	9992981	1.50
TO 160000000	1601530	1600395	1599648	1600256	1600975	1599287	1599577	1599996	1599475	15988611	3.69

*** FREQUENCY TEST ***

DIGIT	0	1	2	3	4	5	6	7	8	9	91CHI-SQ.
BLK 1	159673	160063	160321	160718	160254	158730	160274	159926	159481	1605601	19.19
BLK 2	160212	160308	159967	160189	159808	160340	159528	159507	160367	1597741	6.13
BLK 3	159694	159993	159249	160347	160015	160290	160082	160175	160460	1596951	7.53
BLK 4	160810	159718	160268	159354	160249	159808	160210	160072	160027	1594841	10.25
BLK 5	159373	159911	159917	160302	160162	160447	159676	160439	159845	1599281	6.58
BLK 6	160148	160068	159924	159803	160392	160206	159606	159877	159906	1600701	2.82
BLK 7	160192	159612	160232	159909	160119	160284	160029	160271	159817	1595351	4.18
BLK 8	160584	160103	159709	159550	160244	159630	160426	160365	159821	1595681	8.55
BLK 9	160750	160207	160057	159845	159704	159664	159902	159477	159980	1604141	8.05
BLK10	160094	160412	160004	160239	160028	159888	159844	159887	159771	1598331	2.29
TOTAL	1601530	1600395	1599648	1600256	1600975	1599287	1599577	1599996	1599475	15988611	3.69

DIGIT	0	1	2	3	4	5	6	7	8	9	91CHI-SQ.
BLK 1	10021	9863	10077	9913	10007	10044	10071	10025	10034	99451	4.45
BLK 2	10012	9878	10169	10067	10079	9727	10059	10064	9923	100221	14.28
BLK 3	9972	10042	10037	10050	9945	9870	10072	10043	9932	100371	3.94
BLK 4	9952	10229	9965	9858	9930	9802	10074	9973	10073	101441	15.25
BLK 5	10010	9891	9835	10165	9935	9989	10010	10193	10037	99351	11.37
BLK 6	10039	9998	9997	9989	10093	9845	10072	10006	9865	100961	6.70
BLK 7	9927	10143	10117	10122	10013	9995	9902	9933	9873	99751	8.54
BLK 8	9963	9977	10130	10050	10198	9909	10038	9788	9888	100591	13.12
BLK 9	9936	10058	10015	10039	9965	9846	10066	9878	10116	100811	7.34
BLK10	9768	10131	9948	10016	10067	10111	10053	9986	9884	100361	10.85
TOTAL	99600	100210	100290	100269	100232	99138	100417	99889	99625	1003301	15.93

DIGIT	0	1	2	3	4	5	6	7	8	9	91CHI-SQ.
BLK 1	20033	19741	20246	19980	20086	19771	20130	20089	19957	199671	10.83
BLK 2	19924	20271	20002	19908	19875	19672	20146	20016	20005	201811	13.26
BLK 3	20049	19889	19832	20154	20028	19834	20082	20199	19902	200311	7.59
BLK 4	19890	20120	20247	20172	20211	19904	19940	19721	19761	200341	15.53
BLK 5	19704	20189	19963	20055	20032	19957	20119	19864	20000	201171	8.85
BLK 6	20166	19962	19838	20187	20102	19813	19828	20179	19970	199551	10.01
BLK 7	19899	19874	20081	20118	19871	19734	20080	20029	20114	202001	9.71
BLK 8	20008	20017	20112	20144	20049	20045	19949	19829	19772	200751	6.38
BLK 9	19952	20119	19969	20148	19858	20046	19967	20122	19995	198241	5.43
BLK10	20122	19982	20120	20167	19939	19798	19736	19975	20312	198491	14.62
TOTAL	199747	200164	200410	201033	200051	198574	199977	200023	199788	2002331	17.31

DIGIT	0	1	2	3	4	5	6	7	8	9	91CHI-SQ.
BLK 1	49967	49903	50083	50053	49896	49432	50286	50298	49999	500831	10.62
BLK 2	49633	50307	50207	50216	50336	49706	50131	49591	49626	502471	18.06
BLK 3	50064	49870	50006	50317	49954	49570	49971	50185	49884	501791	7.78
BLK 4	50083	50084	50114	50447	49865	49866	49589	49949	50279	497241	11.77
BLK 5	49940	49901	49958	49908	50324	49999	49898	49872	50220	499801	4.08
BLK 6	50049	50072	49938	50143	49855	50371	49859	49560	49944	502091	9.02
BLK 7	50170	50463	49751	49830	49988	49996	50111	49923	50067	497011	8.93
BLK 8	49620	50072	49718	50359	49778	50117	50066	50184	50214	498721	10.43
BLK 9	50079	49504	49890	49933	49915	50284	50006	50228	50006	501551	8.66
BLK10	49925	50276	50047	49877	50438	49845	50172	49824	50119	494771	13.27
TOTAL	499530	500452	499712	501083	500349	499186	500089	499614	500358	4996271	5.78

$\frac{1}{\sqrt{2}}$
100 万桁

$\frac{1}{\sqrt{2}}$
200 万桁

$\frac{1}{\sqrt{2}}$
500 万桁

*** FREQUENCY TEST ***

DIGIT	0	1	2	3	4	5	6	7	8	9	CHI-SQ.
BLK 1	99600	100210	100290	100269	100232	99138	100417	99889	99625	1003301	15.93
BLK 2	100147	99954	100120	100764	99819	99436	99560	100134	100163	999031	12.20
BLK 3	99989	99973	99896	100051	100179	100370	99757	99432	100164	1001891	6.27
BLK 4	99790	100535	99469	100189	99766	100113	100177	100107	100281	995731	10.20
BLK 5	100004	99780	99937	99810	100353	100129	100178	100052	100125	996321	4.15
BLK 6	100808	99837	100195	99481	100115	99732	100134	99912	99818	999681	11.32
BLK 7	99458	99850	100232	100270	99799	100570	99437	100276	100152	999561	12.26
BLK 8	99966	99854	99583	100076	100225	100127	100110	100317	99852	998901	4.15
BLK 9	100333	100208	99538	100093	100307	100020	99750	99794	100038	999191	5.84
BLK10	99934	100003	100383	99330	99925	100347	100158	99928	100054	999381	7.63
TOTAL	1000029	1000204	999643	1000333	1000720	999982	999678	999841	1000272	9992981	1.50

1/2
1000
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枳

1/2 1600 万枳

*** FREQUENCY SUMMARY ***

DIGIT	0	1	2	3	4	5	6	7	8	9	CHI-SQ.	
T0	1000	10	7	8	11	9	7	10	18	12	81	9.60
T0	2000	21	17	23	19	17	22	16	28	17	201	6.10
T0	5000	54	44	49	49	44	57	45	56	50	521	4.08
T0	10000	108	98	109	82	100	104	90	104	113	921	8.38
T0	20000	178	190	216	184	190	215	207	200	223	1971	10.04
T0	50000	458	488	492	500	490	507	522	484	541	5181	9.73
T0	100000	952	1005	1004	980	1016	1001	1032	964	1027	10191	6.41
T0	200000	1971	2002	2005	1965	2053	2002	2001	1949	2038	20141	4.57
T0	500000	4931	5064	4975	4977	5143	4970	4973	4990	4971	50061	6.61
T0	1000000	9959	10106	9876	10058	10100	10002	9939	10008	10007	99451	4.85
T0	2000000	19830	19974	20016	19855	20253	20082	19945	19992	20042	200111	6.33
T0	5000000	49899	49500	50051	50138	50055	50326	49923	50129	49975	500041	8.29
T0	10000000	99814	98924	100436	100191	100024	100155	99886	100008	100441	1001211	16.66
T0	20000000	199636	198685	200271	199870	200358	200075	200843	199978	200298	1999861	14.43
T0	40000000	399882	398701	400728	399855	399948	399389	401077	400429	399608	4003831	10.68
T0	50000000	499479	499237	500546	499995	500108	499218	501393	500048	499600	5003761	8.04
T0	80000000	799389	799988	800328	799435	799986	799855	801650	799440	799523	8004061	5.31
T0	100000000	999897	1000114	1000208	999674	1000126	999358	1001246	999359	999452	10005661	3.19
T0	160000000	1600607	1600210	1600168	1599804	1602014	1597630	1601457	1598274	1598559	16012771	11.85

*** FREQUENCY TEST ***

DIGIT	0	1	2	3	4	5	6	7	8	9	CHI-SQ.
BLK 1	159778	158625	160177	160160	160093	160154	160221	159978	160761	1600531	16.63
BLK 2	160254	160298	159975	159861	160065	159409	160532	160024	159657	1599251	5.84
BLK 3	159480	160504	160182	159893	159769	159655	160558	160249	159310	1604001	10.94
BLK 4	160373	160245	159999	159929	160168	160172	159931	159450	159927	1598061	3.83
BLK 5	159504	160316	159995	159592	159891	160465	160408	159739	159868	1602221	6.51
BLK 6	160395	159959	159778	159896	160107	159694	159880	159829	160175	1602871	3.00
BLK 7	160281	160195	159555	160086	160874	159629	159846	159880	159508	1601461	9.53
BLK 8	160054	160160	159987	160542	160575	159499	159815	159556	159758	1600541	7.48
BLK 9	160398	160016	160136	159973	160169	159365	160089	159736	159771	1603471	5.38
BLK10	160090	159892	160384	159872	160303	159588	160177	159833	159824	1600371	3.35
TOTAL	1600607	1600210	1600168	1599804	1602014	1597630	1601457	1598274	1598559	16012771	11.85

DIGIT	0	1	2	3	4	5	6	7	8	9	CHI-SQ.
BLK 1	9959	10106	9876	10058	10100	10002	9939	10008	10007	99451	4.85
BLK 2	9871	9868	10140	9797	10153	10080	10006	9984	10035	100661	13.06
BLK 3	10089	9753	9934	10180	9961	10119	10060	9922	10002	99801	13.15
BLK 4	9995	9759	10121	10182	9938	10000	9906	10025	9974	101001	12.99
BLK 5	9985	10014	9980	9921	9903	10125	10012	10190	9957	99131	7.78
BLK 6	9986	9898	10011	10059	10021	9982	9928	9926	10170	100191	5.49
BLK 7	10012	9910	10157	9888	10016	10034	10128	9867	10008	99801	8.14
BLK 8	10041	9831	10108	9907	10002	9916	10037	9901	10131	101261	10.18
BLK 9	9954	9828	10051	10073	9938	9955	10074	10081	9996	100501	6.01
BLK10	9922	9957	10058	10126	9992	9942	9796	10104	10161	99421	11.23
TOTAL	99814	98924	100436	100191	100024	100155	99886	100008	100441	1001211	16.66

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100
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DIGIT	0	1	2	3	4	5	6	7	8	9	CHI-SQ.
BLK 1	19830	19974	20016	19855	20253	20082	19945	19992	20042	200111	6.33
BLK 2	20084	19512	20055	20362	19899	20119	19966	19947	19976	200801	20.73
BLK 3	19971	19912	19991	19980	19924	20107	19940	20116	20127	199321	3.20
BLK 4	20053	19741	20265	19795	20018	19950	20165	19768	20139	201061	14.83
BLK 5	19876	19785	20109	20199	19930	19897	19870	20185	20157	199921	10.22
BLK 6	20084	19895	19799	19991	20030	19987	20097	20060	20246	198111	8.44
BLK 7	19768	19865	20011	19943	20103	20007	20126	20106	19835	202361	9.81
BLK 8	20112	19941	19931	20035	19936	20005	20112	19804	20239	198851	7.37
BLK 9	19963	20035	20147	19939	20150	19941	20109	20034	19677	200051	8.56
BLK10	19895	20025	19947	19771	20115	19980	20513	19966	19860	199281	18.48
TOTAL	199636	198685	200271	199870	200358	200075	200843	199978	200298	1999861	14.43

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200
万
枳

*** FREQUENCY TEST ***

DIGIT	0	1	2	3	4	5	6	7	8	9	CHI-SQ.
BLK 1	49899	49500	50051	50138	50055	50326	49923	50129	49975	500041	8.29
BLK 2	49915	49424	50385	50053	49969	49829	49963	49879	50466	501171	15.34
BLK 3	49852	49782	49860	49981	50060	50131	50211	49990	50228	499051	4.32
BLK 4	49970	49979	49975	49698	50274	49789	50746	49980	49629	499601	18.18
BLK 5	49968	49971	49761	50038	50071	49759	50167	49961	50064	502401	4.29
BLK 6	50245	50175	49884	50047	49713	49785	50011	50076	50203	498611	6.03
BLK 7	50239	49927	50639	49935	49842	49832	49918	49979	49565	501241	14.80
BLK 8	49794	49943	50173	49965	49964	49938	50138	50435	49478	501721	11.85
BLK 9	49806	50557	49523	49987	50039	50079	50105	49834	49847	502231	13.90
BLK 10	49791	49979	50295	50153	50121	49750	50211	49785	50145	497701	7.93
TOTAL	499479	499237	500546	499995	500108	499218	501393	500048	499600	5003761	8.04

√2
500
万
桁

*** FREQUENCY TEST ***

DIGIT	0	1	2	3	4	5	6	7	8	9	CHI-SQ.
BLK 1	99814	98924	100436	100191	100024	100155	99886	100008	100441	1001211	16.66
BLK 2	99822	99761	99835	99679	100334	99920	100957	99970	99857	998651	12.92
BLK 3	100213	100146	99645	100085	99784	99544	100178	100037	100267	1001011	5.69
BLK 4	100033	99870	100812	99900	99806	99770	100056	100414	99043	1002961	19.56
BLK 5	99597	100536	99818	100140	100160	99829	100316	99619	99992	999931	8.02
BLK 6	100350	100190	99977	99994	100123	99984	99740	99559	100246	998371	5.24
BLK 7	99949	100079	99754	99533	100233	100275	100138	100284	99535	1002201	7.82
BLK 8	99611	100482	100051	99913	99522	100378	100379	99549	100142	999731	11.33
BLK 9	100396	99957	99843	100115	99626	99706	100444	99687	100169	1000571	7.50
BLK 10	100112	100169	100037	100124	100514	99797	99152	100232	99760	1001031	12.04
TOTAL	999897	1000114	1000208	999674	1000126	999358	1001246	999359	999452	10005661	3.19

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3. Serial test

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*** SERIAL TEST : OVERALL : CHI-SQUARE = 73.357 ***

J =	0	1	2	3	4	5	6	7	8	9	TOTAL
I = 0	79528	80112	80071	79663	80145	79868	79502	79861	80548	798131	799111
I = 1	80112	79971	79922	80246	79997	79923	79693	79945	80046	802551	800110
I = 2	79971	80277	79933	79970	79926	79783	79742	80189	79570	804271	799788
I = 3	80010	79854	79587	80230	79962	79928	80082	79855	80220	805071	800235
I = 4	80123	80281	79829	79798	79716	80044	80076	80262	80098	799741	800201
I = 5	79920	79934	79761	79909	80154	80432	79934	80270	79799	800411	800154
I = 6	79967	79570	80402	79977	80118	79842	79721	79802	79810	796761	798885
I = 7	79597	80668	80082	80414	79926	79842	79999	80084	80071	798771	800560
I = 8	80020	79751	80126	79991	80083	80494	80447	80099	79971	796561	800638
I = 9	79863	79692	80075	80036	80175	79998	79689	80193	80505	800921	800318
TOTAL	799111	800110	799788	800234	800202	800154	798885	800560	800638	8003181	8000000

ブロック No.	1	2	3	4	5
χ²	90.227	105.775	85.121	99.619	107.787
ブロック No.	6	7	8	9	10
χ²	91.085	72.337	102.231	95.918	88.021

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*** SERIAL TEST : OVERALL : CHI-SQUARE = 83.204 ***

J =	0	1	2	3	4	5	6	7	8	9	TOTAL
I = 0	160531	159861	160316	160113	160132	159519	160683	160706	159441	1602281	1601530
I = 1	160035	160452	159121	160268	160026	160062	160286	159922	160049	1601741	1600395
I = 2	160054	160494	159583	160570	160102	159835	159909	159283	159697	1601211	1599648
I = 3	160328	159900	160624	159818	159587	160199	159825	160356	160232	1593871	1600256
I = 4	160487	159645	159928	159429	160411	160058	160165	160258	160542	1600521	1600975
I = 5	159938	159772	160493	159950	159500	160140	159615	159590	160130	1601591	1599287
I = 6	159914	160127	159664	160250	160311	160284	159674	159729	160208	1594161	1599577
I = 7	160108	160119	160006	160007	160971	159761	160066	159728	159337	1598931	1599996
I = 8	160195	160289	160478	160362	159876	159960	159440	159745	159670	1594601	1599475
I = 9	159940	159736	159435	159489	160059	159469	159914	160679	160169	1599711	1598861
TOTAL	1601530	1600395	1599648	1600256	1600975	1599287	1599577	1599996	1599475	15988611	16000000

ブロット NO.	1	2	3	4	5
χ^2	109.800	79.167	114.053	86.683	85.668
ブロット NO.	6	7	8	9	10
χ^2	107.471	91.482	80.854	101.092	85.977

*** SERIAL TEST : OVERALL : CHI-SQUARE = 106.206 ***

J =	0	1	2	3	4	5	6	7	8	9	TOTAL
I = 0	10041	9904	10206	10041	9943	9946	9999	9833	9743	99451	99601
I = 1	10120	10070	10005	9914	10120	9983	10021	9860	10028	100881	100209
I = 2	9967	10048	9958	10090	9989	9897	10199	10007	9971	101641	100290
I = 3	9899	10072	10010	9923	10064	9930	10195	10127	10051	99981	100269
I = 4	10000	9980	10080	9981	10068	9958	10036	10008	10015	101061	100232
I = 5	9878	9961	10049	9979	9812	9838	9769	9984	9799	100691	99138
I = 6	9908	10214	9958	10087	10040	10031	10001	10087	10158	99331	100417
I = 7	9941	9953	9949	10042	10087	9705	10241	9878	10053	100401	99889
I = 8	9798	9996	10022	10041	10061	9953	9914	10062	9915	98631	99625
I = 9	10048	10012	10053	10171	10048	9897	10042	10043	9892	101241	100330
TOTAL	99600	100210	100290	100269	100232	99138	100417	99889	99625	1003301	10000000

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*** SERIAL TEST : OVERALL : CHI-SQUARE = 100.995 ***

J =	0	1	2	3	4	5	6	7	8	9	TOTAL
I = 0	20125	19789	20328	20139	19936	19910	19940	19839	19808	199341	199748
I = 1	20290	19988	19840	19944	20059	19818	20122	19952	20042	201091	200164
I = 2	19868	20295	20184	20083	19965	19800	20285	20055	19863	200121	200410
I = 3	20022	20233	20207	20258	20038	19981	20083	20136	20061	200141	201033
I = 4	20016	19990	19984	19973	20073	19911	19972	19891	20104	201371	200051
I = 5	19678	19994	20030	19918	19699	19893	19650	19885	19842	199851	198574
I = 6	19928	20020	19919	20196	20086	19896	19920	20103	20012	198961	199976
I = 7	19879	19990	19975	19967	20152	19772	20177	19999	20109	200031	200023
I = 8	19907	20036	19942	20197	20003	19897	19810	20133	19924	199391	199788
I = 9	20034	19829	20001	20358	20040	19696	20018	20030	20023	202041	200233
TOTAL	199747	200164	200410	201033	200051	198574	199977	200023	199788	2002331	20000000

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*** SERIAL TEST : OVERALL : CHI-SQUARE = 95.120 ***

J =	0	1	2	3	4	5	6	7	8	9	TOTAL
I = 0	50439	49577	50246	49850	49908	49650	50173	50011	49702	499751	499531
I = 1	50473	50263	49738	49932	50000	49762	49880	50130	50208	500661	500452
I = 2	49750	50233	50134	50197	49956	49889	50095	49736	49910	498121	499712
I = 3	50134	50338	50272	50152	49733	50222	50236	50123	50063	498091	501082
I = 4	49728	50009	49857	49998	50236	50208	49912	49921	50336	501441	500349
I = 5	49546	49847	50205	50057	49804	49961	49837	49826	49962	501411	499186
I = 6	49724	50173	49827	50208	50208	50123	49878	49829	50331	497881	500089
I = 7	49876	50014	49678	50023	50247	49762	50340	49883	49830	499611	499614
I = 8	50030	50290	49818	50570	50056	50112	49945	49773	50005	497591	500358
I = 9	49830	49708	49937	50096	50201	49497	49793	50382	50011	501721	499627
TOTAL	499530	500452	499712	501083	500349	499186	500089	499614	500358	4996271	50000000

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*** SERIAL TEST : OVERALL : CHI-SQUARE = 84.322 ***

J =	0	1	2	3	4	5	6	7	8	9	TOTAL
I = 0	100572	99555	100010	99851	100061	99590	100400	100399	99646	999461	1000030
I = 1	100276	100150	99374	99983	100121	100057	100093	100091	100065	999941	1000204
I = 2	99537	100098	99835	100157	100183	100052	99853	99549	100174	1002051	999643
I = 3	100230	99969	100437	99975	99498	100175	100098	100238	100216	994971	1000333
I = 4	99907	99726	100125	99708	100180	100126	100145	100362	100430	1000111	1000720
I = 5	99789	100102	100378	100021	99558	100289	99830	99622	100072	1003201	999981
I = 6	99749	100392	99580	100424	100159	100563	99475	99738	100056	995421	999678
I = 7	100087	99974	99656	99950	100649	99675	100561	99628	99680	999811	999841
I = 8	100214	100221	100210	100291	100201	100040	99482	99921	99831	998611	1000272
I = 9	99668	100017	100038	99973	100110	99415	99741	100293	100102	999411	999298
TOTAL	1000029	1000204	999643	1000333	1000720	999982	999678	999841	1000272	9992981	100000000

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*** SERIAL TEST : OVERALL : CHI-SQUARE = 105.645 ***

J =	0	1	2	3	4	5	6	7	8	91	TOTAL
I = 0	159928	160541	159281	160352	159894	160915	160305	159758	160072	1595601	1600606
I = 1	159756	159903	160288	160010	160496	159800	160165	159406	159949	1604381	1600211
I = 2	160270	159679	160370	160209	159741	159044	160061	160457	159897	1604401	1600168
I = 3	159842	160504	160366	159594	160081	159570	160816	159441	159828	1597621	1599804
I = 4	160316	159846	160322	160291	159903	159686	160514	160063	160549	1605241	1602014
I = 5	160016	159580	160002	159973	159573	159438	159863	159171	159892	1601221	1597630
I = 6	159874	160649	160342	159847	160883	160219	159926	160254	159465	1599981	1601457
I = 7	159796	160363	159627	159638	160373	159728	159803	160099	159343	1595041	1598274
I = 8	160566	159861	159587	159794	160382	159891	159451	159467	159917	1605531	1598559
I = 9	160243	159284	159983	160096	160688	160249	160553	160158	159647	1603761	1601277
TOTAL	1600607	1600210	1600168	1599804	1602014	1597630	1601457	1598274	1598559	16012771	16000000

ブロッツノ.	1	2	3	4	5
χ^2	111.880	86.430	115.120	94.591	123.784
ブロッツノ.	6	7	8	9	10
χ^2	104.218	107.350	80.186	122.282	82.807

*** SERIAL TEST : OVERALL : CHI-SQUARE = 112.440 ***

J =	0	1	2	3	4	5	6	7	8	91	TOTAL
I = 0	9977	9942	9926	9939	10124	10131	9883	10137	9866	98891	99814
I = 1	9859	9925	9916	9852	9981	9836	9775	9767	10023	99911	98925
I = 2	10029	9999	10242	10042	10092	9871	9939	10062	10071	100891	100436
I = 3	10030	9984	9926	10096	9923	10024	10159	10027	10124	98971	100190
I = 4	10108	9800	9937	10064	9875	10032	10131	10001	10057	100191	100024
I = 5	9832	9770	10250	10190	10003	9882	9983	10041	10125	100791	100155
I = 6	9986	9711	10122	9946	9939	10093	10076	9888	10047	100781	99886
I = 7	9925	9958	10050	10059	10090	10099	10027	9939	9919	99421	100008
I = 8	10035	10013	10002	9990	10022	10111	9939	10213	10068	100481	100441
I = 9	10033	9822	10065	10013	9975	10076	9974	9933	10141	100891	100121
TOTAL	99814	98924	100436	100191	100024	100155	99886	100008	100441	1001211	1000000

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*** SERIAL TEST : OVERALL : CHI-SQUARE = 108.432 ***

J =	0	1	2	3	4	5	6	7	8	91	TOTAL
I = 0	19944	19859	19795	19988	20294	20064	20074	19983	19797	198381	199636
I = 1	19896	19907	19776	19814	20028	19696	19847	19803	20040	198791	198686
I = 2	20146	20072	20109	19899	20117	19642	20032	20108	20003	201421	200270
I = 3	19833	19881	20027	20015	19949	20106	20172	19882	20109	198961	199870
I = 4	20104	19643	20058	20227	20007	20152	20104	19946	20156	199611	200358
I = 5	19766	19806	20390	20072	20040	20014	19903	20069	19982	200331	200075
I = 6	20153	19776	20283	19986	19943	20206	20285	20170	20000	200411	200843
I = 7	19855	20023	19883	20010	20029	20240	20154	19831	19950	200031	199978
I = 8	19970	20080	19876	19943	20034	19951	20263	20068	20080	200331	200298
I = 9	19969	19638	20074	19916	19917	20004	20009	20118	20181	201601	199986
TOTAL	199636	198685	200271	199870	200358	200075	200843	199978	200298	1999861	2000000

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*** SERIAL TEST : OVERALL : CHI-SQUARE = 89.297 ***

J =	0	1	2	3	4	5	6	7	8	91	TOTAL
I = 0	49834	50151	49595	49829	50289	50162	49894	50013	49889	498231	499479
I = 1	49769	49842	49896	50114	50136	49701	50050	49614	50175	499411	499238
I = 2	50157	50040	50393	50043	49985	49580	50092	50048	49918	502901	500546
I = 3	49812	50073	49984	49774	49880	50079	50638	49901	49933	499211	499995
I = 4	50080	49546	49970	50277	49854	49958	50299	49921	50269	499341	500108
I = 5	49726	49925	50220	50215	49831	49788	49943	49797	49852	499211	499218
I = 6	50167	49997	50583	50045	49987	50103	50278	50444	49640	501491	501393
I = 7	50133	50201	50018	50163	49800	50096	50009	50059	49651	499171	500047
I = 8	49782	49776	49865	49852	50155	49639	50066	50028	50112	503251	499600
I = 9	50019	49686	50022	49683	50191	50112	50124	50223	50161	501551	500376
TOTAL	499479	499237	500546	499995	500108	499218	501393	500048	499600	5003761	5000000

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*** SERIAL TEST : OVERALL : CHI-SQUARE = 92.570 ***

J =	0	1	2	3	4	5	6	7	8	91	TOTAL
I = 0	99805	100556	99480	100177	99701	100687	100040	99832	99890	997291	999897
I = 1	100001	99878	100188	100042	100330	99691	100091	99627	100148	1001181	1000114
I = 2	100294	99731	100197	100345	99538	99416	100033	100374	99895	1003851	1000208
I = 3	100063	100557	100106	99462	99940	99889	100582	99539	99823	997131	999674
I = 4	99976	99648	99815	100257	99615	99876	100234	99873	100735	1000971	1000126
I = 5	99757	99970	100206	100208	99453	99724	100083	99771	100200	999861	999358
I = 6	100089	100355	100428	99762	100468	100179	99878	100388	99346	1003531	1001246
I = 7	99993	100222	99865	99715	100060	100099	99953	100094	99773	995851	999359
I = 8	99885	99690	99984	99759	100488	99675	99924	99757	99780	1005101	999452
I = 9	100034	99507	99939	99947	100533	100122	100428	100104	99862	1000901	1000566
TOTAL	999897	1000114	1000208	999674	1000126	999358	1001246	999359	999452	10005661	10000000

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4. Poker hand test

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*** POKER HAND TEST ***

BLOCK	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
CL. 1	48268	48343	48444	48583	48327	48350	48384	48465	48654	484571	484275	483840.00
CL. 2	80718	80434	80635	80602	80665	80469	80394	80562	80268	805431	805290	806400.00
CL. 3	17384	17620	17188	17202	17391	17371	17439	17412	17391	172301	173628	172800.00
CL. 4	11515	11405	11564	11415	11471	11627	11640	11468	11565	116321	115302	115200.00
CL. 5	1410	1455	1449	1492	1445	1433	1406	1387	1417	13911	14285	14400.00
CL. 6	694	729	701	691	677	732	721	687	690	7321	7054	7200.00
CL. 7	11	14	19	15	24	18	16	19	15	151	166	160.00
CHI2	4.11	8.92	1.85	5.25	7.58	2.34	4.27	5.48	5.79	3.391	10.08	

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*** POKER HAND TEST ***

BLOCK	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
CL. 1	96886	96704	96172	96802	96934	96516	97073	96769	96699	966341	967189	967680.00
CL. 2	161097	161065	161705	161214	161244	161503	161086	161372	161498	1611741	1612958	1612800.00
CL. 3	34497	34780	34622	34724	34627	34570	34454	34619	34713	347881	346394	345600.00
CL. 4	23079	23048	23129	22869	22835	22980	23005	22869	22749	230691	229632	230400.00
CL. 5	2963	2902	2892	2937	2936	2925	2881	2920	2820	28731	29049	28800.00
CL. 6	1450	1471	1459	1415	1391	1480	1468	1424	1497	14301	14485	14400.00
CL. 7	28	30	21	39	33	26	33	27	24	321	293	320.00
CHI2	3.49	2.69	9.33	5.18	5.03	4.06	2.15	2.94	10.20	1.881	9.58	

$\frac{1}{\sqrt{2}}$ 100 万枰

*** POKER HAND TEST ***

BLOCK	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
CL. 1	6033	6041	6129	6143	6172	6023	6039	6081	5963	60941	60718	60480.00
CL. 2	10104	10027	10101	10087	9979	10078	10048	10015	10125	100411	100605	100800.00
CL. 3	2159	2168	2019	2032	2161	2151	2226	2235	2207	21571	21515	21600.00
CL. 4	1421	1497	1480	1451	1428	1479	1420	1410	1427	14461	14459	14400.00
CL. 5	187	177	174	185	166	169	188	177	192	1621	1777	1800.00
CL. 6	93	89	94	102	92	97	77	80	86	961	906	900.00
CL. 7	3	1	3	0	2	3	2	2	0	41	20	20.00
CHI2	1.22	3.13	12.32	12.91	4.79	2.91	4.64	4.99	5.51	4.731	2.22	

$\frac{1}{\sqrt{2}}$ 200 万枰

*** POKER HAND TEST ***

BLOCK	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
CL. 1	12074	12272	12195	12120	12057	11983	12063	12122	12102	119921	120980	120960.00
CL. 2	20131	20188	20057	20063	20166	20246	20130	20116	20142	201191	201358	201600.00
CL. 3	4327	4051	4312	4461	4364	4329	4280	4373	4327	44161	43240	43200.00
CL. 4	2918	2931	2907	2830	2873	2851	2934	2835	2863	29581	28900	28800.00
CL. 5	364	359	335	365	354	400	419	367	377	3251	3665	3600.00
CL. 6	182	196	189	157	182	188	172	184	186	1851	1821	1800.00
CL. 7	4	3	5	4	4	3	2	3	3	51	36	40.00
CHI2	0.66	21.93	4.04	8.99	0.71	6.78	12.54	1.98	1.38	9.021	2.50	

$\frac{1}{\sqrt{2}}$ 500万桁

*** POKER HAND TEST ***												
BLOCK	1	2	3	4	5	6	7	8	9	10I	TOTAL	EXPECTED
CL. 1	30518	30200	30085	30177	30251	30288	30035	30138	30160	298921	301744	302400.00
CL. 2	50298	50307	50480	50273	50397	50285	50460	50339	50543	506251	504007	504000.00
CL. 3	10539	10976	10808	10917	10870	10739	11050	10790	10773	108261	108288	108000.00
CL. 4	7277	7182	7168	7273	7130	7254	7166	7374	7121	72291	72174	72000.00
CL. 5	889	888	1002	886	906	945	830	914	954	9121	9126	9000.00
CL. 6	470	436	450	465	440	479	450	442	438	5071	4577	4500.00
CL. 7	9	11	7	9	6	10	9	3	11	91	84	100.00
CHI2	11.02	3.83	13.53	3.28	3.00	5.21	12.95	9.89	5.21	12.671	8.25	

$\frac{1}{\sqrt{2}}$ 1000万桁

*** POKER HAND TEST ***												
BLOCK	1	2	3	4	5	6	7	8	9	10I	TOTAL	EXPECTED
CL. 1	60718	60262	60539	60173	60052	60494	60585	60675	60267	604061	604171	604800.00
CL. 2	100605	100753	100682	100799	101168	100797	100702	100819	101008	1008441	1008177	1008000.00
CL. 3	21515	21725	21609	21840	21599	21666	21808	21488	21568	216651	216483	216000.00
CL. 4	14459	14441	14384	14540	14350	14293	14171	14322	14402	143251	143687	144000.00
CL. 5	1777	1888	1851	1744	1866	1866	1825	1813	1822	18271	18279	18000.00
CL. 6	906	915	919	892	945	861	884	864	919	9161	9021	9000.00
CL. 7	20	16	16	12	20	23	25	19	14	171	182	200.00
CHI2	2.22	7.00	2.86	10.60	9.22	5.56	7.80	3.22	3.70	1.841	8.44	

$\frac{1}{\sqrt{2}}$ 1600万桁

*** POKER HAND TEST ***												
BLOCK	1	2	3	4	5	6	7	8	9	10I	TOTAL	EXPECTED
CL. 1	96601	96951	97041	96910	96728	96473	96919	96787	96677	968861	967973	967680.00
CL. 2	161371	161309	160764	161160	161707	161620	161068	161336	160912	1610731	1612320	1612800.00
CL. 3	34624	34366	34585	34477	34433	34319	34776	34648	34759	345641	345551	345600.00
CL. 4	22958	23109	23230	22958	22781	23158	22843	22967	23267	231151	230386	230400.00
CL. 5	2927	2808	2936	3010	2915	2941	2889	2860	2921	29091	29116	28800.00
CL. 6	1491	1426	1425	1441	1406	1471	1475	1377	1434	14231	14369	14400.00
CL. 7	28	31	19	44	30	18	30	25	30	301	285	320.00
CHI2	3.82	3.61	10.53	11.16	5.88	11.99	4.55	4.90	5.04	1.271	7.60	

$\frac{1}{\sqrt{2}}$ 100万桁

*** POKER HAND TEST ***												
BLOCK	1	2	3	4	5	6	7	8	9	10I	TOTAL	EXPECTED
CL. 1	6111	6018	6138	6095	6111	6007	5898	6173	6054	59871	60592	60480.00
CL. 2	10036	10080	10022	10134	10063	10077	10213	10032	10060	100981	100815	100800.00
CL. 3	2198	2224	2099	2062	2130	2182	2205	2164	2162	21221	21548	21600.00
CL. 4	1390	1394	1460	1451	1418	1451	1402	1380	1432	14911	14269	14400.00
CL. 5	176	200	190	177	167	192	183	169	196	1881	1838	1800.00
CL. 6	88	83	87	81	110	89	95	81	94	1121	920	900.00
CL. 7	1	1	4	0	1	2	4	1	2	21	18	20.00
CHI2	3.89	6.78	6.33	8.13	7.32	1.40	9.74	7.39	1.69	8.861	2.97	

$\frac{1}{\sqrt{2}}$ 200万桁

*** POKER HAND TEST ***												
BLOCK	1	2	3	4	5	6	7	8	9	10I	TOTAL	EXPECTED
CL. 1	12129	12233	12118	12071	12041	11920	11992	12097	12237	121711	121009	120960.00
CL. 2	20116	20156	20140	20245	20158	20258	20235	20063	20043	201321	201546	201600.00
CL. 3	4422	4161	4312	4369	4284	4332	4344	4400	4373	42961	43293	43200.00
CL. 4	2784	2911	2869	2782	2923	2938	2868	2883	2821	28631	28642	28800.00
CL. 5	376	367	359	352	384	365	365	359	331	3711	3629	3600.00
CL. 6	171	168	199	176	206	184	194	193	191	1651	1847	1800.00
CL. 7	2	4	3	5	4	3	2	5	4	21	34	40.00
CHI2	7.96	8.67	2.38	4.82	6.55	4.65	3.51	3.14	7.19	3.321	3.46	

$\frac{1}{\sqrt{2}}$ 500万桁

*** POKER HAND TEST ***												
BLOCK	1	2	3	4	5	6	7	8	9	10I	TOTAL	EXPECTED
CL. 1	30473	30119	29886	30531	30367	30092	30191	30259	30401	302231	302542	302400.00
CL. 2	50335	50480	50539	50192	50177	50687	50621	50093	50311	502121	503647	504000.00
CL. 3	10713	10835	10950	10795	10732	10755	10647	10807	10786	108721	107892	108000.00
CL. 4	7113	7156	7246	7127	7412	7137	7163	7441	7142	72941	72231	72000.00
CL. 5	910	928	900	891	876	869	912	954	913	8951	9048	9000.00
CL. 6	449	471	471	456	428	450	455	442	439	5001	4561	4500.00
CL. 7	7	11	8	8	8	10	11	4	8	41	79	100.00
CHI2	4.64	2.94	8.28	4.97	10.31	4.17	3.72	16.94	2.36	11.601	6.66	

√ 1000 万柄

*** POKER HAND TEST ***

BLOCK	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
CL. 1	60592	60417	60459	60450	60624	60487	60682	60520	60091	605311	604853	604800.00
CL. 2	100815	100731	100864	100714	100523	100855	100879	100930	101225	1007551	1008291	1008000.00
CL. 3	21548	21745	21487	21454	21658	21487	21444	21662	21518	214891	215492	216000.00
CL. 4	14269	14373	14549	14604	14436	14361	14268	14176	14393	145151	143944	144000.00
CL. 5	1838	1791	1745	1866	1808	1915	1827	1806	1837	18041	18237	18000.00
CL. 6	920	927	878	897	939	866	877	885	924	8941	9007	9000.00
CL. 7	18	16	18	15	12	29	23	21	12	121	176	200.00
CH12	2.97	2.79	4.60	7.65	6.28	13.41	4.52	4.18	9.21	4.801	7.31	

5. Gap test

π 800 万柄

*** GAP TEST : FREQUENCY ***

BLOCK=	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
GAP= 0	8010	7862	7925	8012	8056	8091	7875	7974	7775	79481	79528	80000.000
GAP= 1	7253	7144	7262	7290	7210	7191	7135	7273	7219	71591	72137	72000.000
GAP= 2	6442	6399	6453	6449	6498	6483	6438	6460	6513	65921	64727	64800.000
GAP= 3	5898	5929	5844	5761	5858	5914	5855	5757	5857	57621	58436	58320.000
GAP= 4	5344	5328	5222	5336	5235	5392	5266	5196	5360	51991	52878	52488.000
GAP= 5	4685	4586	4722	4572	4713	4739	4774	4792	4712	46891	46984	47239.200
GAP= 6	4194	4314	4208	4279	4240	4370	4207	4243	4229	42811	42565	42515.280
GAP= 7	3834	3909	3826	3791	3862	3822	3896	3796	3815	38271	38378	38263.752
GAP= 8	3506	3445	3457	3351	3375	3455	3401	3439	3439	34981	34367	34437.377
GAP= 9	2955	3150	3111	3040	3072	3090	3075	3098	3066	30841	30741	30993.639
GAP= 10	2732	2819	2688	2746	2783	2825	2797	2736	2800	27521	27679	27894.275
GAP= 11	2527	2492	2453	2422	2382	2539	2541	2525	2425	25011	24807	25104.848
GAP= 12	2205	2232	2302	2247	2186	2259	2233	2168	2321	22751	22429	22594.363
GAP= 13	2017	2104	2004	2116	2070	1981	2030	2048	2017	20101	20397	20334.927
GAP= 14	1874	1773	1854	1885	1798	1821	1827	1879	1756	17791	18247	18301.434
GAP= 15	1657	1586	1653	1714	1591	1593	1613	1685	1609	16361	16338	16471.291
GAP= 16	1494	1401	1478	1469	1454	1439	1424	1460	1456	15261	14602	14824.162
GAP= 17	1335	1320	1348	1366	1316	1395	1374	1355	1349	13451	13503	13341.745
GAP= 18	1138	1207	1206	1222	1167	1181	1249	1192	1160	11591	11881	12007.571
GAP= 19	1089	1061	1114	1077	1088	1097	1068	1111	1036	11111	10852	10806.814
GAP= 20	954	1027	1014	970	1022	955	910	927	986	10151	9780	9726.132
GAP= 21	841	813	896	870	848	817	908	897	893	8961	8679	8753.519
GAP= 22	794	771	767	775	742	754	765	756	799	7711	7694	7878.167
GAP= 23	716	714	743	670	740	723	719	703	716	7461	7190	7090.350
GAP= 24	648	612	641	616	626	645	668	624	692	6451	6417	6381.315
GAP= 25	563	607	553	614	624	562	563	577	567	5231	5753	5743.184
GAP= 26	519	522	549	483	509	498	521	539	556	5391	5235	5168.866
GAP= 27	484	424	493	435	525	471	458	484	459	4801	4713	4651.979
GAP= 28	410	430	399	437	429	465	422	415	410	3931	4210	4186.781
GAP= 29	359	426	373	362	394	391	394	386	379	3721	3836	3768.103
GAP= 30	383	402	335	359	341	340	327	340	350	3401	3517	3391.293
GAP= 31	285	311	273	294	312	287	305	314	271	3021	2954	3052.163
GAP= 32	301	289	255	312	282	263	291	273	234	2861	2786	2746.947
GAP= 33	240	250	248	231	268	233	247	245	236	2471	2445	2472.252
GAP= 34	234	212	260	220	222	231	225	238	225	2241	2291	2225.027
GAP= 35	189	194	210	208	194	208	192	194	204	2101	2003	2002.524
GAP= 36	187	196	165	193	174	196	198	170	176	1851	1840	1802.272
GAP= 37	180	149	158	159	155	157	163	169	167	1271	1584	1622.045
GAP= 38	149	144	157	150	159	157	136	143	149	1651	1509	1459.840
GAP= 39	102	139	138	138	134	150	123	134	145	1111	1314	1313.856
GAP= 40	119	134	118	125	119	118	116	133	123	1091	1215	1182.471
GAP= 41	124	100	105	112	119	111	102	96	102	1161	1087	1064.224
GAP= 42	97	93	95	95	96	100	111	99	95	911	972	957.801
GAP= 43	83	83	88	83	76	81	79	104	95	831	855	862.021
GAP= 44	87	69	73	85	76	81	68	89	74	631	765	775.819
GAP= 45	53	63	76	67	64	64	76	67	69	591	658	698.237
GAP= 46	68	62	54	65	72	57	60	44	64	571	603	628.413
GAP= 47	60	55	60	56	61	67	52	46	53	571	567	565.572
GAP= 48	52	55	49	43	58	43	59	56	48	571	520	509.015
GAP= 49	47	49	49	38	43	41	41	40	47	311	426	458.113
GAP= 50	43	45	37	47	39	43	46	45	48	451	438	412.302
GAP= 51	46	38	42	35	44	44	46	27	46	311	399	371.072
GAP= 52	30	34	33	31	37	31	36	38	49	321	351	333.965
GAP= 53	21	28	29	25	29	33	31	34	24	211	275	300.568
GAP= 54	28	33	25	27	22	19	26	28	30	331	271	270.511
GAP= 55	29	31	20	25	17	19	25	25	20	281	239	243.460
GAP= 56	17	21	18	25	32	18	12	24	21	221	210	219.114

GAP= 57	27	24	15	14	20	20	18	22	19	361	215	197.203
GAP= 58	21	19	14	20	16	19	19	19	12	171	176	177.482
GAP= 59	13	14	20	21	15	16	13	16	20	211	169	159.734
GAP= 60	12	11	11	15	16	13	9	14	21	151	137	143.761
GAP= 61	14	9	14	10	15	7	8	10	10	151	112	129.385
GAP= 62	19	9	13	9	12	16	12	12	17	111	130	116.446
GAP= 63	17	6	8	15	14	10	16	9	16	161	127	104.802
GAP= 64	9	11	9	13	9	10	6	8	9	101	94	94.321
GAP= 65	14	9	8	10	9	8	8	9	9	121	96	84.889
GAP= 66	3	6	9	7	5	8	7	7	11	61	69	76.400
GAP= 67	4	8	8	8	4	6	5	3	5	101	61	68.760
GAP= 68	11	5	3	7	7	8	10	10	10	81	79	61.884
GAP= 69	7	2	5	6	6	8	8	5	15	81	70	55.696
GAP= 70	7	3	6	5	4	4	7	7	7	71	57	50.126
GAP= 71	7	5	3	8	3	4	4	2	4	61	46	45.114
GAP= 72	2	5	7	3	6	3	4	4	3	51	42	40.602
GAP= 73	5	5	7	2	3	4	5	4	3	51	43	36.542
GAP= 74	2	0	3	0	5	2	6	2	2	21	24	32.888
GAP= 75	1	1	1	3	1	1	3	2	3	21	18	29.599
GAP= 76	1	0	3	3	2	0	2	2	3	11	17	26.639
GAP= 77	1	1	2	1	2	7	3	5	0	31	25	23.975
GAP= 78	1	2	1	1	5	1	1	0	1	01	13	21.578
GAP= 79	4	3	1	4	3	2	2	2	5	11	27	19.420
GAP= 80	0	0	3	2	2	3	2	2	4	11	19	17.478
GAP= 81	1	3	1	2	0	1	3	0	0	21	13	15.730
GAP= 82	2	2	0	3	1	2	2	1	2	21	17	14.157
GAP= 83	0	1	2	1	0	1	2	3	1	21	13	12.741
GAP= 84	0	2	1	0	3	1	2	1	2	01	12	11.467
GAP= 85	0	0	1	4	0	0	1	3	0	21	11	10.321
GAP= 86	3	1	2	1	0	0	1	0	1	21	11	9.289
GAP= 87	0	1	1	0	1	2	0	4	2	01	11	8.360
GAP= 88	1	1	0	0	0	0	0	0	0	11	3	7.524
GAP= 89	2	0	0	0	0	0	0	2	0	11	5	6.771
GAP= 90	1	1	0	1	1	1	1	0	0	11	7	6.094
GAP= 91	0	0	0	4	1	1	0	1	1	31	11	5.485
GAP= 92	0	1	0	0	1	0	2	0	1	01	5	4.936
GAP= 93	1	1	1	0	1	0	2	0	0	21	8	4.443
GAP= 94	0	0	0	1	0	2	0	0	0	11	4	3.998
GAP= 95	0	1	0	1	2	0	0	0	0	01	4	3.599
GAP= 96	0	0	2	1	0	1	0	0	0	01	4	3.239
GAP= 97	2	0	0	0	0	0	1	0	0	01	3	2.915
GAP= 98	0	1	1	0	0	0	0	0	0	11	3	2.623
GAP= 99	0	0	0	1	1	0	0	1	0	01	3	2.361
GAP=100	0	0	0	1	0	0	0	0	0	11	2	2.125
GAP=101	0	0	0	0	0	0	0	0	0	01	0	1.912
GAP=102	0	0	0	0	1	0	0	0	0	01	1	1.721
GAP=103	0	0	0	0	0	0	0	0	1	01	1	1.549
GAP=104	0	0	0	1	0	0	0	1	0	01	2	1.394
GAP=105	0	0	0	0	0	0	0	0	0	11	1	1.255
GAP=106	0	1	0	0	0	0	1	0	0	01	2	1.129
GAP=107	0	0	0	0	0	0	0	0	0	01	0	1.016
GAP=108	1	0	0	0	0	0	0	0	0	01	1	0.915
GAP=109	0	0	0	0	0	0	0	0	0	01	0	0.823
GAP=110	0	0	0	0	0	0	0	0	0	01	0	0.741
GAP=111	0	0	0	0	0	1	0	0	0	01	1	0.667
GAP=112	0	0	0	1	0	0	0	0	0	01	1	0.600
GAP=113	1	1	0	0	0	0	1	0	0	01	3	0.540
GAP=114	0	0	0	0	0	0	0	0	1	01	1	0.486
GAP=115	0	0	0	0	0	0	0	0	0	01	0	0.438
GAP=116	0	0	0	0	0	0	0	0	0	01	0	0.394
GAP=117	0	0	0	0	0	0	0	0	0	01	0	0.354
GAP=118	0	0	0	0	0	0	0	0	0	01	0	0.319
GAP=119	0	0	0	0	0	0	0	0	0	01	0	0.287
GAP=120	0	0	0	0	0	0	1	0	0	01	1	0.258
GAP=121	0	0	0	0	0	0	0	0	0	01	0	0.233
GAP=122	0	0	0	0	0	0	0	0	0	01	0	0.209
GAP=123	0	0	0	0	0	0	0	0	0	01	0	0.188
GAP=124	0	0	0	0	0	0	0	0	0	01	0	0.169
GAP=125	0	0	0	0	0	0	0	0	0	01	0	0.153
GAP=126	0	0	0	0	0	0	0	0	0	11	1	0.137
GAP=127	0	0	0	0	0	0	0	0	0	01	0	0.124
GAP=128	0	0	0	0	0	0	0	0	0	01	0	0.111
GAP=129	0	0	0	0	0	0	1	0	0	01	1	0.100
GAP>130	0	0	0	0	0	0	0	0	0	01	0	0.001

 TOTAL 79948 79862 79914 79835 79855 80343 79798 79903 79757 798861 79911080000.000

$\frac{1}{\sqrt{2}}$ 1600万桁

*** GAP TEST : FREQUENCY ***												
BLOCK=	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
GAP= 0	16011	16283	16128	16084	15863	16095	16057	15947	16042	160201	160531	160000.000
GAP= 1	14308	14399	14392	14681	14099	14524	14411	14576	14614	143371	144341	144000.000
GAP= 2	12749	13039	13028	13106	12779	12741	12990	12905	13067	130551	129459	129600.000
GAP= 3	11743	11558	11518	11831	11655	11718	11842	11722	11758	116961	117042	116640.000
GAP= 4	10659	10552	10538	10441	10349	10496	10422	10466	10627	106841	105234	104976.000
GAP= 5	9379	9430	9349	9404	9297	9444	9423	9532	9403	96381	94300	94478.400
GAP= 6	8442	8629	8429	8707	8531	8533	8519	8554	8518	84541	85316	85030.560
GAP= 7	7484	7536	7499	7739	7716	7554	7606	7869	7785	76601	76449	76527.504
GAP= 8	6949	6951	6810	6916	6889	6863	6810	6914	6924	68101	68837	68874.754
GAP= 9	6260	6250	6091	6222	6114	6271	6262	6243	6277	61001	62090	61987.278
GAP= 10	5495	5470	5410	5506	5574	5574	5724	5762	5557	56401	55712	55788.550
GAP= 11	4942	5034	5028	4973	5040	5072	4962	5027	4946	49251	49950	50209.693
GAP= 12	4532	4630	4521	4485	4662	4470	4593	4455	4555	44371	45340	45188.726
GAP= 13	4009	3974	4153	4054	4103	4162	4022	4089	4157	41071	40830	40669.853
GAP= 14	3607	3623	3616	3663	3749	3613	3680	3670	3660	37141	36596	36602.868
GAP= 15	3271	3277	3311	3323	3313	3303	3373	3398	3335	31741	33078	32942.581
GAP= 16	3029	2888	2953	3121	3043	3063	2880	2943	2981	30471	29948	29648.323
GAP= 17	2666	2619	2665	2612	2686	2602	2582	2640	2656	25651	26293	26683.491
GAP= 18	2453	2363	2450	2406	2403	2411	2392	2407	2415	24091	24109	24015.142
GAP= 19	2197	2251	2212	2144	2183	2243	2174	2244	2105	21161	21869	21615.627
GAP= 20	1913	1939	1980	1921	1964	1907	1980	1959	1957	19491	19469	19452.265
GAP= 21	1813	1769	1803	1761	1765	1822	1749	1696	1754	17361	17668	17507.038
GAP= 22	1533	1559	1581	1630	1599	1517	1539	1547	1569	15671	15641	15756.334
GAP= 23	1430	1363	1370	1396	1456	1449	1508	1416	1416	13941	14198	14180.701
GAP= 24	1277	1267	1258	1302	1231	1260	1250	1282	1314	12871	12728	12762.631
GAP= 25	1137	1110	1170	1153	1105	1122	1143	1140	1177	11811	11438	11486.368
GAP= 26	1007	1093	1024	1031	1046	1056	1037	995	1024	10601	10373	10337.731
GAP= 27	1001	910	940	904	872	916	944	947	915	9391	9288	9303.958
GAP= 28	832	863	922	811	809	864	878	827	823	8461	8475	8373.562
GAP= 29	720	749	736	773	751	773	710	708	771	7941	7485	7536.206
GAP= 30	686	693	689	680	674	676	648	692	650	6341	6723	6782.585
GAP= 31	618	606	614	594	600	644	585	606	628	6331	6128	6104.327
GAP= 32	542	525	546	576	524	552	476	568	517	5791	5405	5493.894
GAP= 33	483	539	504	494	491	501	470	508	502	5021	4994	4944.505
GAP= 34	480	460	445	471	448	468	466	437	395	4231	4493	4450.054
GAP= 35	422	385	387	387	403	411	402	353	411	3691	3930	4005.049
GAP= 36	363	347	380	355	326	348	339	344	339	3391	3460	3604.544
GAP= 37	307	317	349	332	286	305	332	312	327	3211	3188	3244.090
GAP= 38	296	277	290	284	294	257	331	308	284	2761	2897	2919.681
GAP= 39	237	286	268	239	270	249	265	240	257	2531	2564	2627.713
GAP= 40	229	243	228	260	207	228	237	261	223	2351	2351	2364.941
GAP= 41	186	193	213	205	208	205	226	217	217	2201	2090	2128.447
GAP= 42	219	207	173	209	202	178	199	194	203	2051	1989	1915.602
GAP= 43	184	184	173	160	175	174	182	151	197	1691	1749	1724.042
GAP= 44	158	156	155	142	164	135	155	156	143	1281	1492	1551.638
GAP= 45	143	140	134	125	161	128	136	132	137	1401	1376	1396.474
GAP= 46	123	133	139	111	133	115	128	120	128	1301	1260	1256.827
GAP= 47	115	110	102	105	112	106	124	120	111	1321	1138	1131.144
GAP= 48	108	98	98	117	94	94	97	104	100	901	1000	1018.030
GAP= 49	86	77	90	82	85	97	102	97	95	871	898	916.227
GAP= 50	88	78	81	67	89	87	84	88	67	911	820	824.604
GAP= 51	68	86	73	93	90	79	81	46	70	761	769	742.144
GAP= 52	60	65	62	72	51	75	62	74	69	661	656	667.929
GAP= 53	62	74	59	60	63	46	67	52	51	681	602	601.136
GAP= 54	60	42	48	48	41	67	50	48	54	581	516	541.023
GAP= 55	50	53	56	56	56	54	46	43	48	451	507	486.920
GAP= 56	58	43	50	44	41	42	54	36	39	521	459	438.228
GAP= 57	38	59	51	38	45	33	46	34	36	411	421	394.406
GAP= 58	37	24	44	32	44	36	38	36	35	361	361	354.965
GAP= 59	32	28	29	23	31	27	29	30	27	291	285	319.468
GAP= 60	30	24	25	28	38	29	31	29	25	261	285	287.522
GAP= 61	23	31	29	28	23	25	19	28	23	291	258	258.769
GAP= 62	17	24	26	17	26	26	31	22	27	301	246	232.893
GAP= 63	23	19	19	22	25	36	15	16	22	271	224	209.603
GAP= 64	20	30	8	15	19	9	23	22	21	191	186	188.643
GAP= 65	16	13	22	12	22	19	23	17	13	181	175	169.779
GAP= 66	14	13	20	15	16	17	15	14	19	241	167	152.801
GAP= 67	14	17	9	13	20	9	13	16	7	141	132	137.521
GAP= 68	14	6	11	10	18	11	9	13	11	101	113	123.769
GAP= 69	11	16	18	12	12	8	8	13	11	121	121	111.392
GAP= 70	12	9	11	4	15	8	10	16	11	151	111	100.253
GAP= 71	13	12	14	6	17	7	9	13	9	91	109	90.227
GAP= 72	7	11	4	10	9	11	4	7	9	81	80	81.205
GAP= 73	7	11	8	6	5	6	11	11	9	91	83	73.084
GAP= 74	4	5	4	5	3	2	5	6	7	61	47	65.776
GAP= 75	8	6	2	6	2	4	12	9	9	61	64	59.198
GAP= 76	1	9	6	12	3	8	3	2	4	31	51	53.278
GAP= 77	4	2	8	3	10	8	2	2	9	31	51	47.951
GAP= 78	5	5	1	3	2	0	1	4	7	31	31	43.155
GAP= 79	4	2	1	5	4	4	4	5	6	31	38	38.840
GAP= 80	2	2	2	4	5	4	4	6	4	31	36	34.956
GAP= 81	1	2	1	2	2	4	4	1	2	31	25	31.460
GAP= 82	3	3	5	3	2	3	2	2	2	41	29	28.314
GAP= 83	5	3	3	4	3	6	5	2	5	31	39	25.483

GAP= 84	2	3	2	2	1	3	2	2	2	21	21	22.935
GAP= 85	2	6	5	0	3	4	1	2	2	51	30	20.641
GAP= 86	4	2	3	3	0	0	2	1	1	31	19	18.577
GAP= 87	2	2	2	2	1	3	0	3	2	01	17	16.719
GAP= 88	0	2	1	1	4	2	1	0	2	11	14	15.047
GAP= 89	2	0	0	1	2	3	1	3	0	01	12	13.543
GAP= 90	1	3	1	3	0	0	0	1	0	31	12	12.188
GAP= 91	3	0	1	0	1	1	0	1	0	01	7	10.970
GAP= 92	1	2	1	2	0	1	0	1	1	11	10	9.873
GAP= 93	1	1	0	0	0	0	0	2	0	31	7	8.885
GAP= 94	2	1	2	0	0	1	1	0	0	21	9	7.997
GAP= 95	1	1	0	2	0	0	0	0	0	01	4	7.197
GAP= 96	1	0	1	2	1	2	0	1	0	11	9	6.477
GAP= 97	0	0	0	1	0	0	1	1	1	21	6	5.830
GAP= 98	2	0	0	0	0	0	0	0	2	11	5	5.247
GAP= 99	1	0	0	1	0	0	0	0	0	01	2	4.722
GAP=100	0	1	0	0	0	3	0	0	1	11	6	4.250
GAP=101	0	2	1	0	1	1	0	0	0	01	5	3.825
GAP=102	1	0	0	0	1	0	0	0	0	01	2	3.442
GAP=103	0	0	0	0	0	1	0	0	0	01	1	3.098
GAP=104	0	2	0	0	0	0	0	0	1	01	3	2.788
GAP=105	0	0	0	0	0	1	0	0	0	01	1	2.509
GAP=106	2	0	0	0	1	0	0	0	0	01	3	2.259
GAP=107	0	0	0	0	1	0	0	0	0	11	2	2.033
GAP=108	0	0	0	1	0	0	0	0	0	11	2	1.829
GAP=109	0	0	0	2	0	1	0	0	0	11	4	1.646
GAP=110	0	1	0	0	0	0	0	0	0	01	1	1.482
GAP=111	0	0	0	0	0	0	0	0	0	01	0	1.334
GAP=112	0	0	0	0	0	0	0	0	0	01	0	1.200
GAP=113	0	1	0	0	0	0	0	0	0	01	1	1.080
GAP=114	0	0	0	0	0	0	0	0	0	01	0	0.972
GAP=115	0	0	0	0	0	1	0	0	0	01	1	0.875
GAP=116	0	0	0	0	0	0	0	1	0	01	1	0.788
GAP=117	0	0	0	0	0	0	0	0	0	01	0	0.709
GAP=118	0	0	1	0	0	0	0	0	0	01	1	0.638
GAP=119	0	0	0	0	0	0	0	0	0	01	0	0.574
GAP=120	0	0	0	0	0	0	0	0	0	01	0	0.517
GAP=121	0	0	0	0	0	0	0	0	0	01	0	0.465
GAP=122	0	0	0	0	0	0	0	0	0	01	0	0.419
GAP=123	0	0	0	0	0	0	0	0	0	01	0	0.377
GAP=124	0	0	0	0	0	0	0	0	0	01	0	0.339
GAP=125	0	0	0	0	0	0	0	1	0	01	1	0.305
GAP=126	0	0	0	0	0	0	0	0	0	01	0	0.275
GAP=127	0	0	0	0	0	0	0	0	0	11	1	0.247
GAP=128	0	0	0	0	0	0	0	0	0	01	0	0.222
GAP=129	0	0	0	0	0	0	0	0	0	01	0	0.200
GAP>130	0	0	0	0	0	0	0	0	0	01	0	1.806
TOTAL	159672	160211	159693	160809	159372	160147	160191	160583	160749	1600931	1601529	1600000.000

*** GAP TEST : FREQUENCY ***

$\sqrt{2}$ 1600万桁

BLOCK=	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
GAP= 0	15958	16031	15855	16030	15859	16041	16084	15922	16226	159211	159928	160000.000
GAP= 1	14356	14328	14403	14560	14218	14573	14422	14488	14315	144471	144110	144000.000
GAP= 2	12908	12849	12969	13048	12749	12592	12849	12853	13058	129981	128874	129600.000
GAP= 3	11750	11763	11396	11688	11540	11768	11796	11743	11814	116971	116955	116640.000
GAP= 4	10632	10662	10560	10601	10530	10497	10419	10610	10363	106031	105477	104976.000
GAP= 5	9377	9404	9305	9341	9387	9463	9514	9360	9399	93661	93917	94478.400
GAP= 6	8381	8550	8536	8436	8522	8604	8629	8568	8523	85501	85299	85030.560
GAP= 7	7675	7647	7635	7801	7794	7802	7655	7663	7641	75981	76711	76527.504
GAP= 8	6762	6976	6837	6968	6773	7087	7029	6842	7009	68911	69174	68874.754
GAP= 9	6314	6164	6163	6130	6245	6359	6209	6229	6288	61601	62261	61987.250
GAP= 10	5576	5737	5610	5674	5521	5699	5555	5535	5549	57041	56161	55788.578
GAP= 11	4964	5203	4947	4971	5008	5047	5080	5096	5108	49981	50422	50209.695
GAP= 12	4488	4494	4502	4547	4526	4520	4586	4501	4550	44651	45179	45188.726
GAP= 13	3984	4040	4027	3993	4047	4065	4080	4234	4016	41421	40629	40669.853
GAP= 14	3579	3675	3655	3682	3758	3626	3612	3624	3679	36331	36524	36602.868
GAP= 15	3293	3212	3296	3251	3346	3315	3169	3142	3318	32351	32577	32942.581
GAP= 16	2955	2980	2992	2983	2966	3026	2960	3028	3000	28961	29786	29648.323
GAP= 17	2687	2565	2667	2647	2644	2682	2635	2623	2665	26871	26502	26683.491
GAP= 18	2391	2370	2451	2434	2416	2380	2471	2414	2323	24301	24080	24015.142
GAP= 19	2143	2198	2223	2212	2129	2214	2193	2131	2199	22121	21854	21613.627
GAP= 20	2012	1949	1948	1913	1949	2025	1945	1917	1876	20241	19558	19452.265
GAP= 21	1768	1745	1736	1798	1721	1738	1760	1816	1718	17451	17545	17507.038
GAP= 22	1586	1609	1535	1486	1591	1449	1537	1554	1571	15551	15474	15756.334
GAP= 23	1409	1451	1406	1421	1446	1354	1355	1412	1407	14771	14138	14180.701
GAP= 24	1279	1188	1266	1326	1323	1267	1199	1291	1306	12751	12720	12762.631
GAP= 25	1114	1161	1150	1151	1172	1103	1098	1125	1180	11111	11365	11486.368
GAP= 26	1026	1123	976	1039	1036	1001	1039	1029	1036	9951	10300	10337.731
GAP= 27	904	918	960	899	938	989	977	933	905	9411	9364	9303.958
GAP= 28	895	826	883	850	845	875	854	866	831	7951	8520	8373.562
GAP= 29	791	702	786	764	756	731	759	787	696	7331	7505	7536.206
GAP= 30	679	693	689	666	664	653	613	665	729	6821	6733	6782.585
GAP= 31	627	632	602	595	616	580	619	638	610	6171	6136	6104.327
GAP= 32	549	519	537	500	548	576	587	530	551	5751	5472	5493.894
GAP= 33	518	495	490	469	527	480	512	455	506	5101	4962	4944.505
GAP= 34	437	427	448	455	450	430	429	451	444	4291	4400	4450.054
GAP= 35	384	416	398	389	378	423	414	394	382	3951	3973	4005.049
GAP= 36	362	344	377	355	347	371	379	349	345	3551	3584	3604.544
GAP= 37	359	302	302	362	312	308	321	316	320	3151	3217	3244.090
GAP= 38	284	254	267	301	306	311	291	281	315	2851	2895	2919.681
GAP= 39	280	279	275	244	247	247	286	265	262	2871	2672	2627.713

GAP= 40	240	242	240	243	246	226	246	226	256	2581	2423	2364.941
GAP= 41	215	216	231	203	227	222	228	224	222	2361	2224	2128.447
GAP= 42	172	176	199	205	215	178	202	192	171	1901	1900	1915.602
GAP= 43	177	184	165	191	166	172	173	150	176	1661	1720	1724.042
GAP= 44	142	153	161	158	142	164	144	144	171	1301	1509	1551.638
GAP= 45	132	136	133	146	132	131	143	139	134	1511	1377	1396.474
GAP= 46	119	133	140	125	125	106	91	126	137	1261	1228	1256.827
GAP= 47	93	114	115	102	116	131	111	106	114	1111	1113	1131.144
GAP= 48	120	92	88	117	87	101	109	115	106	991	1034	1018.030
GAP= 49	89	87	80	86	80	92	87	98	91	821	872	916.227
GAP= 50	92	92	93	86	88	85	85	93	62	841	860	824.604
GAP= 51	79	79	69	83	82	65	81	85	70	691	762	742.144
GAP= 52	72	80	74	65	81	56	54	63	60	761	682	667.929
GAP= 53	57	72	55	46	59	61	64	66	49	641	593	601.136
GAP= 54	54	42	69	69	52	59	55	61	66	481	575	541.023
GAP= 55	49	40	52	45	48	47	45	46	55	521	479	486.920
GAP= 56	48	49	48	40	40	51	55	41	51	351	458	438.228
GAP= 57	39	26	43	46	32	42	43	49	42	311	393	394.406
GAP= 58	35	27	44	28	33	34	36	30	33	291	329	354.965
GAP= 59	32	34	22	30	31	20	39	36	31	291	304	319.468
GAP= 60	22	32	25	31	29	27	24	32	24	251	271	287.522
GAP= 61	25	24	27	26	30	26	25	22	26	231	254	258.769
GAP= 62	25	23	29	20	22	23	28	18	22	271	237	232.893
GAP= 63	16	22	22	22	18	20	18	18	19	91	184	209.603
GAP= 64	21	18	23	18	22	16	22	17	21	171	195	188.643
GAP= 65	18	13	20	27	18	15	13	10	16	241	174	169.779
GAP= 66	14	17	18	12	13	18	10	12	10	171	141	152.801
GAP= 67	20	9	14	11	10	18	10	14	13	151	134	137.521
GAP= 68	10	15	17	9	5	13	14	14	12	151	124	123.769
GAP= 69	10	15	7	9	10	16	11	15	8	71	108	111.392
GAP= 70	5	11	12	12	11	7	10	7	15	91	99	100.253
GAP= 71	7	5	10	9	8	11	8	9	11	61	84	90.227
GAP= 72	12	9	12	5	6	3	4	16	7	61	81	81.205
GAP= 73	7	11	8	9	8	6	13	8	8	81	86	73.084
GAP= 74	11	10	5	7	7	5	9	3	7	91	73	65.776
GAP= 75	5	6	9	7	1	5	4	4	7	41	52	59.198
GAP= 76	0	4	4	4	5	3	4	6	6	41	40	53.278
GAP= 77	3	3	3	4	7	8	3	4	5	61	46	47.951
GAP= 78	4	9	6	8	3	4	4	4	0	21	44	43.155
GAP= 79	8	2	4	4	5	9	5	4	6	51	52	38.840
GAP= 80	3	5	3	4	3	4	3	1	4	61	36	34.956
GAP= 81	2	4	2	1	3	2	3	8	1	51	31	31.460
GAP= 82	5	5	3	2	4	2	1	5	1	41	32	28.314
GAP= 83	4	1	0	1	3	3	1	2	0	71	22	25.483
GAP= 84	1	3	1	1	1	2	3	1	2	31	18	22.935
GAP= 85	3	2	1	3	2	2	1	3	2	21	21	20.641
GAP= 86	3	1	1	2	3	0	1	4	2	11	18	18.577
GAP= 87	2	2	1	0	0	1	0	1	0	11	8	16.719
GAP= 88	0	2	0	1	2	4	1	1	1	41	16	15.047
GAP= 89	5	0	2	0	2	1	4	1	0	01	15	13.543
GAP= 90	2	3	2	0	1	2	2	3	1	11	17	12.188
GAP= 91	2	3	1	3	0	0	0	2	1	31	15	10.970
GAP= 92	1	1	2	0	1	0	1	3	1	31	13	9.873
GAP= 93	0	1	0	1	1	2	1	1	0	41	11	8.885
GAP= 94	0	1	2	2	1	0	2	3	1	01	12	7.997
GAP= 95	0	3	1	0	1	0	0	0	2	11	8	7.197
GAP= 96	0	0	0	0	0	1	2	2	1	01	6	6.477
GAP= 97	0	0	0	1	0	0	2	0	1	21	6	5.830
GAP= 98	0	0	0	0	1	0	0	0	0	01	1	5.247
GAP= 99	1	0	0	0	1	0	0	1	2	21	7	4.722
GAP=100	1	0	0	0	1	0	0	1	0	01	3	4.250
GAP=101	3	0	0	1	1	0	0	1	0	01	6	3.825
GAP=102	1	1	1	0	0	0	0	0	0	01	3	3.442
GAP=103	0	1	0	0	0	0	0	1	0	01	2	3.098
GAP=104	0	0	0	0	0	0	0	0	0	01	0	2.788
GAP=105	1	0	0	0	0	0	0	0	0	01	1	2.509
GAP=106	0	0	0	0	0	0	0	0	0	01	0	2.259
GAP=107	1	0	0	0	0	0	0	0	0	01	1	2.033
GAP=108	0	0	0	0	0	0	0	1	1	01	2	1.829
GAP=109	0	0	0	0	0	0	0	0	0	11	1	1.646
GAP=110	0	0	0	0	0	0	0	0	0	01	0	1.482
GAP=111	0	0	0	0	0	0	0	0	0	01	0	1.334
GAP=112	0	1	0	1	0	0	0	0	0	01	2	1.200
GAP=113	0	0	0	0	0	0	0	0	0	01	0	1.080
GAP=114	0	0	0	0	0	0	0	0	0	01	0	0.972
GAP=115	0	0	0	0	1	0	0	0	0	01	1	0.875
GAP=116	0	0	0	0	0	0	1	0	0	01	1	0.788
GAP=117	0	0	0	0	0	0	0	0	0	01	0	0.709
GAP=118	1	0	0	0	0	0	0	0	0	01	1	0.638
GAP=119	0	0	0	0	0	1	0	0	0	01	1	0.574
GAP=120	0	0	0	0	0	0	0	0	0	01	0	0.517
GAP=121	0	0	0	0	0	0	0	0	0	01	0	0.465
GAP=122	0	0	0	0	0	0	0	0	0	01	0	0.419
GAP=123	0	0	0	0	0	0	0	0	0	01	0	0.377
GAP=124	0	0	0	0	0	0	0	0	0	01	0	0.339
GAP=125	0	0	0	0	0	0	0	0	0	01	0	0.305
GAP=126	0	0	0	0	0	0	0	0	0	01	0	0.275
GAP=127	0	0	0	0	0	0	0	0	0	01	0	0.247
GAP=128	0	0	0	0	0	0	0	0	0	01	0	0.222
GAP=129	0	0	0	0	0	0	0	0	0	01	0	0.200
GAP>130	0	0	0	0	0	0	0	0	0	01	0	1.806
TOTAL	159777	160253	159479	160372	159503	160394	160280	160053	160397	1600891	1600606	1600000.000

6.5-digit sum test

 π 800万桁

*** 5-DIGIT SUM TEST ***

BLOCK=	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
SUM= 0	0	0	6	0	2	2	1	2	0	21	15	16.000
SUM= 1	14	11	6	3	9	6	8	5	7	71	76	80.000
SUM= 2	21	17	20	29	29	29	29	20	20	251	239	240.000
SUM= 3	50	57	59	58	49	57	51	59	55	511	546	560.000
SUM= 4	115	97	115	116	116	143	109	118	104	1171	1150	1120.000
SUM= 5	206	215	201	208	199	199	197	199	191	1891	2004	2016.000
SUM= 6	329	335	318	333	332	350	337	340	330	3831	3387	3360.000
SUM= 7	539	527	502	512	531	532	509	508	543	5311	5234	5280.000
SUM= 8	776	830	747	807	798	805	797	869	774	7571	7960	7920.000
SUM= 9	1130	1113	1086	1146	1113	1167	1168	1118	1067	11821	11290	11440.000
SUM= 10	1524	1626	1641	1629	1627	1623	1571	1596	1593	16171	16047	15936.000
SUM= 11	2161	2113	2166	2106	2082	2195	2136	2150	2135	21191	21363	21440.000
SUM= 12	2820	2753	2807	2832	2776	2788	2801	2786	2676	28151	27854	27920.000
SUM= 13	3456	3458	3554	3501	3464	3579	3557	3656	3659	34071	35291	35280.000
SUM= 14	4394	4293	4327	4313	4355	4294	4340	4230	4444	43001	43290	43360.000
SUM= 15	5201	5214	5197	5173	5148	5247	5199	5235	5218	51931	52025	51936.000
SUM= 16	6070	5986	6016	5971	6017	5937	6105	5881	6170	59751	60128	60720.000
SUM= 17	6975	6874	7047	7016	6902	6982	6985	6966	7162	68521	69761	69360.000
SUM= 18	7788	7892	7821	7741	7819	7710	7723	7861	7798	76651	77818	77440.000
SUM= 19	8430	8483	8487	8324	8528	8292	8352	8502	8426	84471	84271	84480.000
SUM= 20	8978	8997	8934	9132	9055	9148	8961	9048	8919	89081	90080	90096.000
SUM= 21	9440	9348	9555	9328	9406	9451	9261	9391	9332	94471	93959	94000.000
SUM= 22	9612	9568	9491	9484	9522	9505	9569	9417	9725	94551	95348	96000.000
SUM= 23	9486	9538	9604	9599	9454	9491	9452	9649	9430	96541	95357	96000.000
SUM= 24	9480	9493	9278	9364	9425	9345	9489	9498	9325	94291	94126	94000.000
SUM= 25	8933	8930	9011	9070	9052	9126	9115	9004	9071	91501	90462	90096.000
SUM= 26	8504	8571	8462	8488	8479	8681	8508	8386	8434	85881	85101	84480.000
SUM= 27	7676	7639	7803	7795	7615	7706	7779	7806	7726	77381	77283	77440.000
SUM= 28	7025	7036	6909	6981	6911	7000	7028	6842	6853	70811	69666	69360.000
SUM= 29	6051	6171	6042	6036	6114	6005	6078	6132	6136	61251	60890	60720.000
SUM= 30	5289	5189	5116	5139	5177	5116	5217	5162	5106	52321	51743	51936.000
SUM= 31	4308	4399	4364	4414	4515	4226	4339	4389	4431	43961	43781	43360.000
SUM= 32	3566	3545	3510	3607	3519	3627	3538	3489	3464	34781	35343	35280.000
SUM= 33	2745	2841	2807	2864	2787	2668	2795	2710	2793	27951	27805	27920.000
SUM= 34	2140	2087	2234	2175	2202	2123	2082	2121	2154	20951	21413	21440.000
SUM= 35	1596	1613	1605	1549	1658	1640	1647	1681	1626	16071	16222	15936.000
SUM= 36	1114	1100	1153	1192	1145	1134	1125	1094	1111	11161	11284	11440.000
SUM= 37	821	786	747	761	792	788	823	781	783	8201	7902	7920.000
SUM= 38	513	510	549	519	533	544	505	560	488	5021	5223	5280.000
SUM= 39	329	337	318	338	348	338	324	331	359	3311	3353	3360.000
SUM= 40	190	212	189	168	193	195	191	204	174	2051	1921	2016.000
SUM= 41	129	97	104	95	114	117	106	116	108	1161	1102	1120.000
SUM= 42	46	64	55	48	56	54	64	61	56	641	568	560.000
SUM= 43	22	27	22	20	19	27	21	21	18	211	218	240.000
SUM= 44	7	7	11	12	8	6	7	6	6	121	82	80.000
SUM= 45	1	1	4	4	5	2	1	0	0	11	19	16.000

 $\frac{1}{\sqrt{2}}$ 1600万桁

*** 5-DIGIT SUM TEST ***

BLOCK=	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
SUM= 0	7	6	2	4	2	1	4	0	4	41	34	32.000
SUM= 1	13	17	19	12	13	12	18	11	23	241	162	160.000
SUM= 2	49	48	35	49	46	60	52	43	52	511	485	480.000
SUM= 3	121	102	103	123	122	114	105	96	106	1051	1097	1120.000
SUM= 4	229	230	243	215	234	230	215	209	248	2231	2276	2240.000
SUM= 5	414	399	372	390	389	428	395	409	404	3991	3999	4032.000
SUM= 6	717	701	709	701	669	696	682	689	640	7151	6919	6720.000
SUM= 7	1032	1165	1060	1000	1055	1019	1009	1038	1102	10291	10509	10560.000
SUM= 8	1662	1600	1583	1654	1565	1577	1590	1615	1600	15861	16032	15840.000
SUM= 9	2279	2244	2300	2296	2262	2269	2225	2345	2357	23321	22909	22880.000
SUM= 10	3262	3190	3104	3067	3130	3131	3115	3130	3186	31031	31418	31872.000
SUM= 11	4246	4291	4217	4438	4286	4266	4330	4379	4243	43231	43019	42880.000
SUM= 12	5572	5663	5665	5664	5624	5503	5626	5504	5652	56921	56165	55840.000
SUM= 13	6969	6970	7052	6992	6911	6930	7079	7094	7257	70701	70324	70560.000
SUM= 14	8771	8629	8752	8629	8592	8825	8607	8438	8631	87681	86642	86720.000
SUM= 15	10407	10497	10295	10516	10473	10384	10562	10390	10290	103261	104140	103872.000
SUM= 16	12046	12126	12101	12119	11918	12179	12169	12212	12281	122211	121372	121440.000
SUM= 17	13911	13942	13908	13938	13897	14072	13911	13858	13847	138831	139167	138720.000
SUM= 18	15593	15446	15511	15535	15506	15604	15479	15743	15539	156171	155573	154880.000
SUM= 19	16783	16971	16765	17029	16893	17008	16970	17048	16839	169001	169206	168960.000
SUM= 20	18062	18106	18180	17950	18062	18005	17858	17979	17975	180371	180214	180192.000
SUM= 21	18753	18802	18591	18543	18952	18592	18706	18995	18750	187731	187457	188000.000
SUM= 22	19127	19259	19204	19380	19304	19189	19167	19157	19276	191511	192214	192000.000

SUM= 23	19320	19065	19053	19540	19274	19188	19406	19090	19282	192291	192447	192000.000
SUM= 24	18643	18721	18908	18807	18776	18864	18948	18845	18554	185871	187653	188000.000
SUM= 25	17914	18001	18027	18002	18050	18012	17958	17887	17948	180331	179832	180192.000
SUM= 26	16773	16946	16814	16699	17066	17082	16898	16953	16750	167231	168704	168960.000
SUM= 27	15415	15271	15626	15314	15448	15311	15564	15632	15507	156161	154704	154880.000
SUM= 28	13957	13890	13897	13718	13776	13869	13950	13736	13806	138021	138401	138720.000
SUM= 29	12142	12141	12313	12238	12195	12130	12363	12041	12061	121601	121784	121440.000
SUM= 30	10447	10273	10360	10327	10362	10342	10241	10342	10405	104631	103562	103872.000
SUM= 31	8627	8720	8593	8654	8644	8729	8541	8663	8724	86731	86568	86720.000
SUM= 32	7214	7040	6960	6953	7009	6833	6896	6975	7036	70311	69947	70560.000
SUM= 33	5553	5576	5585	5587	5686	5646	5458	5560	5706	54061	55763	55840.000
SUM= 34	4325	4358	4325	4249	4209	4234	4293	4353	4362	43571	43065	42880.000
SUM= 35	3229	3185	3240	3169	3241	3210	3181	3177	3158	32221	32012	31872.000
SUM= 36	2299	2237	2414	2275	2311	2279	2342	2282	2327	22031	22969	22880.000
SUM= 37	1604	1601	1605	1632	1560	1638	1567	1598	1620	15531	15978	15840.000
SUM= 38	1045	1091	1076	1073	1024	1039	1051	999	1036	11081	10542	10560.000
SUM= 39	650	697	657	685	661	677	688	676	658	7181	6767	6720.000
SUM= 40	397	392	389	437	393	431	382	411	379	3891	4000	4032.000
SUM= 41	243	223	205	220	232	223	222	244	214	2141	2255	2240.000
SUM= 42	116	99	113	122	110	112	96	112	79	1231	1082	1120.000
SUM= 43	44	50	46	44	60	41	50	43	38	441	460	480.000
SUM= 44	18	13	21	7	7	13	20	15	15	111	140	160.000
SUM= 45	0	6	2	4	1	3	4	6	3	31	32	32.000

√ 1600万桁

*** 5-DIGIT SUM TEST ***

BLOCK=	1	2	3	4	5	6	7	8	9	101	TOTAL	EXPECTED
SUM= 0	7	4	1	3	0	4	5	4	4	11	33	32.000
SUM= 1	14	26	14	17	20	15	21	9	16	141	166	160.000
SUM= 2	47	44	64	61	37	55	43	49	42	421	484	480.000
SUM= 3	119	112	113	129	121	101	99	102	133	1151	1144	1120.000
SUM= 4	228	242	222	218	215	218	233	203	226	2111	2216	2240.000
SUM= 5	408	410	372	407	409	416	410	395	423	4091	4059	4032.000
SUM= 6	670	689	642	681	669	712	645	666	668	6901	6732	6720.000
SUM= 7	1033	1048	1074	1101	1096	1056	1016	1091	1034	10341	10583	10560.000
SUM= 8	1681	1559	1610	1597	1598	1523	1571	1563	1659	15721	15933	15840.000
SUM= 9	2291	2251	2292	2321	2257	2276	2215	2296	2261	23361	22796	22880.000
SUM= 10	3157	3237	3180	3266	3122	3188	3171	3106	3226	32491	31902	31872.000
SUM= 11	4297	4260	4216	4295	4371	4301	4219	4307	4357	43201	42943	42880.000
SUM= 12	5445	5698	5629	5556	5572	5570	5734	5578	5496	55571	55835	55840.000
SUM= 13	7122	7081	6947	7155	6931	7114	7115	7054	7058	70031	70580	70560.000
SUM= 14	8648	8692	8520	8535	8588	8526	8687	8735	8663	86991	86293	86720.000
SUM= 15	10400	10285	10418	10402	10410	10300	10352	10482	10428	103721	103849	103872.000
SUM= 16	12138	12337	12365	12288	12081	12071	12423	12248	12115	122441	122310	121440.000
SUM= 17	13826	13803	13931	13942	13823	13839	13790	13980	14002	139891	138925	138720.000
SUM= 18	15188	15346	15579	15479	15527	15594	15384	15563	15634	153881	154682	154880.000
SUM= 19	16850	16988	16873	16910	16727	17115	17144	16904	16779	169761	169266	168960.000
SUM= 20	18023	17989	18038	18060	18067	18157	18117	18028	17957	179601	180396	180192.000
SUM= 21	18766	18809	18707	18781	18879	18847	18995	18804	18716	184801	187784	188000.000
SUM= 22	19206	19023	19354	19116	19174	19354	19206	19109	19106	192171	191865	192000.000
SUM= 23	18976	19309	19238	19249	19267	19201	19187	19170	19244	192931	192134	192000.000
SUM= 24	18582	18757	18762	18689	19059	18696	18798	18925	18971	188571	188096	188000.000
SUM= 25	18054	18236	17777	17979	17934	18115	17862	17913	17893	180001	179763	180192.000
SUM= 26	16951	16721	16781	16796	17010	16975	16699	16823	16742	168411	168339	168960.000
SUM= 27	15589	15343	15540	15332	15422	15190	15438	15340	15383	155831	154360	154880.000
SUM= 28	14109	14081	13846	13815	13853	13877	13904	13696	13895	140261	139102	138720.000
SUM= 29	12171	12166	12112	12092	12100	11953	12058	12285	12264	120391	121240	121440.000
SUM= 30	10474	10456	10473	10481	10384	10377	10314	10357	10321	103331	103970	103872.000
SUM= 31	8752	8671	8858	8715	8741	8557	8594	8620	8730	86521	86890	86720.000
SUM= 32	7092	7084	7007	7067	7063	6933	7105	7034	7028	70961	70509	70560.000
SUM= 33	5609	5572	5583	5659	5600	5657	5511	5593	5678	56481	56110	55840.000
SUM= 34	4209	4156	4322	4245	4391	4432	4223	4299	4243	43251	42845	42880.000
SUM= 35	3222	3246	3055	3126	3222	3195	3155	3199	3218	31061	31744	31872.000
SUM= 36	2412	2234	2367	2344	2192	2234	2329	2287	2374	21691	22942	22880.000
SUM= 37	1635	1566	1569	1611	1541	1617	1630	1549	1604	16091	15931	15840.000
SUM= 38	1108	976	1069	1013	1070	1105	1062	996	1030	10451	10474	10560.000
SUM= 39	675	655	635	665	672	724	681	619	618	6861	6630	6720.000
SUM= 40	433	406	444	412	405	390	439	389	392	3831	4093	4032.000
SUM= 41	196	245	202	215	222	228	236	230	209	2501	2233	2240.000
SUM= 42	116	110	111	102	102	118	116	118	103	1121	1108	1120.000
SUM= 43	57	53	59	48	41	55	44	66	41	481	512	480.000
SUM= 44	14	18	25	22	11	18	16	11	14	171	166	160.000
SUM= 45	0	6	4	3	4	1	4	5	2	41	33	32.000

7. 昇順の数の出現

 π の 800 万桁までについて

From 89277 follows 678901	From 3258580 follows 456789	From 6117055 follows 345678
From 138691 follows 234567	From 3275091 follows 012345	From 6134351 follows 4567890
From 216177 follows 456789	From 3322684 follows 890123	From 6271570 follows 678901
From 447855 follows 012345	From 3735793 follows 123456	From 6321949 follows 123456
From 588584 follows 890123	From 3763822 follows 789012	From 6346817 follows 789012
From 814212 follows 012345	From 4039408 follows 678901	From 6362480 follows 345678
From 896310 follows 567890	From 4110469 follows 890123	From 6385988 follows 789012
From 995998 follows 23456789	From 4126220 follows 789012	From 6461090 follows 567890
From 1125519 follows 890123	From 4277855 follows 678901	From 6477033 follows 123456
From 1237867 follows 456789	From 4628914 follows 789012	From 6484826 follows 890123
From 1408930 follows 234567	From 4641405 follows 789012	From 6615916 follows 789012
From 1484644 follows 012345	From 4641680 follows 789012	From 6675284 follows 456789
From 1544305 follows 789012	From 4649881 follows 345678	From 6726670 follows 123456
From 1826710 follows 012345	From 4783371 follows 345678	From 6762246 follows 789012
From 1889018 follows 234567	From 4808815 follows 890123	From 6801561 follows 123456
From 2070918 follows 456789	From 4917012 follows 456789	From 6834992 follows 012345
From 2093127 follows 4567890	From 5223644 follows 567890	From 6900968 follows 678901
From 2157510 follows 678901	From 5236961 follows 345678	From 7148378 follows 789012
From 2443318 follows 678901	From 5418218 follows 234567	From 7166094 follows 678901
From 2458885 follows 123456	From 5457153 follows 567890	From 7393791 follows 234567
From 2609262 follows 678901	From 5472551 follows 123456	From 7420502 follows 890123
From 2676988 follows 234567	From 5668812 follows 901234	From 7574539 follows 456789
From 2686758 follows 456789	From 5707596 follows 345678	From 7633754 follows 345678
From 2899645 follows 456789	From 5708040 follows 123456	From 7818259 follows 456789
From 2955589 follows 567890	From 5837566 follows 678901	From 7860816 follows 567890
From 3043832 follows 789012	From 5846932 follows 123456	From 7966262 follows 012345
From 3079272 follows 901234	From 5940359 follows 5678901	From 7988979 follows 678901
		From 7995403 follows 901234

 $\frac{1}{\sqrt{2}}$ の 1600 万桁までについて

From 13097 follows 8901234	From 3708118 follows 901234	From 6828665 follows 789012
From 102835 follows 901234	From 3858882 follows 901234	From 6832941 follows 456789
From 199977 follows 567890	From 3985813 follows 345678	From 6985792 follows 678901
From 326776 follows 8901234	From 4527189 follows 7890123	From 7081698 follows 567890
From 350936 follows 9012345	From 4534440 follows 567890	From 7150789 follows 678901
From 439367 follows 890123	From 4548090 follows 012345	From 7175184 follows 901234
From 559630 follows 7890123	From 4623759 follows 012345	From 7416707 follows 789012
From 559737 follows 789012	From 4679876 follows 890123	From 7430686 follows 901234
From 707468 follows 123456	From 4682703 follows 89012345	From 7472522 follows 456789
From 767519 follows 901234	From 4712460 follows 890123	From 7510505 follows 012345
From 802104 follows 678901	From 4736728 follows 901234	From 7790813 follows 789012
From 1004490 follows 123456	From 4819505 follows 2345678	From 7911730 follows 567890
From 1125039 follows 234567	From 4943966 follows 345678	From 8004430 follows 345678
From 1145805 follows 567890	From 4944862 follows 123456	From 8016178 follows 890123
From 1275424 follows 456789	From 4952126 follows 123456	From 8091897 follows 345678
From 1642477 follows 345678	From 4991387 follows 234567	From 8167342 follows 345678
From 1675952 follows 345678	From 5009606 follows 456789	From 8345660 follows 012345
From 1712996 follows 234567	From 5145409 follows 567890	From 8365672 follows 123456
From 1809026 follows 012345	From 5209175 follows 7890123	From 8514358 follows 567890
From 1911700 follows 3456789	From 5231091 follows 901234	From 8553339 follows 012345
From 2028796 follows 567890	From 5360097 follows 012345	From 8695671 follows 345678
From 2227501 follows 901234	From 5533987 follows 890123	From 8698667 follows 567890
From 2241156 follows 123456	From 556789 follows 5678901	From 8700561 follows 789012
From 2427944 follows 234567	From 5663863 follows 0123456	From 8835790 follows 789012
From 2461622 follows 567890	From 5825394 follows 678901	From 8860996 follows 5678901
From 2724528 follows 7890123	From 5984161 follows 456789	From 8923503 follows 567890
From 2742054 follows 567890	From 6093573 follows 234567	From 8982536 follows 123456
From 2971389 follows 890123	From 6160422 follows 890123	From 9017717 follows 345678
From 3030369 follows 012345	From 6262427 follows 2345678	From 9302260 follows 567890
From 3246478 follows 789012	From 6293873 follows 234567	From 9470962 follows 012345
From 3415405 follows 789012	From 6331655 follows 890123	From 9809355 follows 567890
From 3492207 follows 123456	From 6341243 follows 789012	From 9873968 follows 678901
From 3515505 follows 3456789	From 6499784 follows 567890	From 9886008 follows 901234
From 3525060 follows 789012	From 6718440 follows 234567	From 9905621 follows 0123456
From 3611541 follows 567890	From 6767180 follows 234567	

From 10023446 follows 789012	From 12355773 follows 901234	From 14435377 follows 234567
From 10038773 follows 345678	From 12462542 follows 789012	From 14826669 follows 345678
From 10048149 follows 789012	From 12511701 follows 456789	From 14848502 follows 901234
From 10069101 follows 678901	From 12518292 follows 123456	From 14853887 follows 234567
From 10189570 follows 345678	From 12947119 follows 012345	From 14889988 follows 8901234
From 10225477 follows 345678	From 13035595 follows 901234	From 14935966 follows 901234
From 10469694 follows 789012	From 13068920 follows 789012	From 14948599 follows 234567
From 10656960 follows 1234567	From 13151410 follows 901234	From 14976667 follows 456789
From 10662447 follows 345678	From 13386405 follows 345678	From 15061524 follows 123456
From 10725398 follows 789012	From 13419168 follows 567890	From 15117186 follows 678901
From 10847979 follows 789012	From 13484286 follows 234567	From 15135613 follows 901234
From 11082252 follows 012345	From 13689570 follows 7890123	From 15180033 follows 3456789
From 11539114 follows 567890	From 14069212 follows 8901234	From 15218059 follows 890123
From 11580428 follows 678901	From 14106950 follows 789012	From 15508725 follows 789012
From 11863239 follows 789012	From 14148548 follows 789012	From 15511802 follows 678901
From 11899020 follows 901234	From 14189825 follows 234567	From 15590345 follows 890123
From 12248841 follows 901234	From 14230155 follows 123456	From 15943018 follows 901234

√2の1600万桁までについて

From 86118 follows 789012	From 5020371 follows 123456	From 9567921 follows 234567
From 315472 follows 890123	From 5078406 follows 567890	From 9703979 follows 890123
From 468292 follows 012345	From 5119166 follows 012345	From 9712445 follows 012345
From 534407 follows 789012	From 5229950 follows 012345	From 9783964 follows 901234
From 589376 follows 567890	From 5576013 follows 890123	From 9903668 follows 012345
From 627657 follows 234567	From 5623565 follows 345678	From 10134126 follows 5678901
From 669775 follows 456789	From 5685982 follows 901234	From 10214195 follows 567890
From 808556 follows 901234	From 5705270 follows 0123456	From 10476751 follows 8901234
From 911284 follows 567890	From 5873624 follows 456789	From 10519377 follows 123456
From 1002203 follows 123456	From 5914798 follows 678901	From 10540072 follows 567890
From 1161606 follows 1234567	From 5954284 follows 789012	From 10670934 follows 012345
From 1162444 follows 012345	From 6145766 follows 789012	From 10764497 follows 5678901
From 1317762 follows 678901	From 6234320 follows 567890	From 10954606 follows 012345
From 1333114 follows 789012	From 6394683 follows 789012	From 10960213 follows 0123456
From 1345043 follows 123456	From 6433743 follows 456789	From 11015583 follows 345678
From 1408324 follows 4567890	From 6510851 follows 012345	From 11037342 follows 456789
From 1490590 follows 678901	From 6553220 follows 012345	From 11224647 follows 567890
From 1532090 follows 789012	From 6573324 follows 567890	From 11307931 follows 678901
From 1610864 follows 345678	From 6583752 follows 123456	From 11368822 follows 123456
From 1675177 follows 901234	From 6583793 follows 012345	From 11410846 follows 901234
From 1797785 follows 901234	From 6700535 follows 345678	From 11511734 follows 345678
From 1821033 follows 6789012	From 6795662 follows 890123	From 11525040 follows 789012
From 1871265 follows 345678	From 6800202 follows 678901	From 11673533 follows 890123
From 1914173 follows 567890	From 6985495 follows 456789	From 11952661 follows 890123
From 1975972 follows 789012	From 7000909 follows 345678	From 11960286 follows 7890123
From 2053802 follows 567890	From 7115609 follows 234567	From 12034473 follows 456789
From 2259217 follows 567890	From 7190846 follows 901234	From 12039302 follows 901234
From 2420552 follows 567890	From 7212966 follows 234567	From 12077545 follows 456789
From 2462319 follows 123456	From 7259816 follows 456789	From 12245576 follows 8901234
From 2468682 follows 678901	From 7318390 follows 012345	From 12356726 follows 1234567
From 2481678 follows 678901	From 7320304 follows 678901	From 12375193 follows 345678
From 2531382 follows 567890	From 7481578 follows 789012	From 12380558 follows 789012
From 2628211 follows 123456	From 7483946 follows 901234	From 12453829 follows 456789
From 2650045 follows 345678	From 7546501 follows 678901	From 12496785 follows 7890123
From 2743520 follows 234567	From 8023867 follows 789012	From 12546346 follows 123456
From 2825541 follows 234567	From 8049522 follows 456789	From 12871041 follows 3456789
From 3229652 follows 567890	From 8133884 follows 456789	From 12896851 follows 234567
From 3345216 follows 901234	From 8397780 follows 456789	From 12952652 follows 901234
From 3383011 follows 234567	From 8500601 follows 456789	From 13160745 follows 7890123
From 3404545 follows 789012	From 8525171 follows 234567	From 13210637 follows 012345
From 3498506 follows 901234	From 8546360 follows 7890123	From 13222236 follows 456789
From 3772567 follows 567890	From 8677520 follows 789012	From 13252302 follows 567890
From 3863752 follows 012345	From 8736770 follows 1234567	From 13257733 follows 012345
From 3907795 follows 890123	From 8809129 follows 901234	From 13415727 follows 678901
From 3941429 follows 678901	From 8923028 follows 4567890	From 13423296 follows 789012
From 4186572 follows 890123	From 8996493 follows 789012	From 13434751 follows 890123
From 4459355 follows 678901	From 9086267 follows 678901	From 13435423 follows 012345
From 4466970 follows 789012	From 9177935 follows 789012	From 13507721 follows 012345
From 4573215 follows 678901	From 9340488 follows 234567	From 13528476 follows 789012
From 4663290 follows 012345	From 9379315 follows 345678	From 13654705 follows 234567
From 4755182 follows 012345	From 9399894 follows 678901	From 13708927 follows 123456
From 4915865 follows 123456	From 9479184 follows 123456	From 13743652 follows 890123
From 4924198 follows 456789	From 9538027 follows 123456	From 13876266 follows 901234

From 13996713 follows 1234567
 From 14002437 follows 012345
 From 14107302 follows 234567
 From 14179051 follows 890123
 From 14695322 follows 678901
 From 14778905 follows 789012
 From 14795960 follows 567890
 From 14809446 follows 234567
 From 14862305 follows 789012
 From 15037949 follows 567890
 From 15069158 follows 456789
 From 15329972 follows 5678901
 From 15459731 follows 123456
 From 15494175 follows 345678
 From 15543620 follows 890123
 From 15672815 follows 567890
 From 15686246 follows 123456
 From 15810114 follows 012345
 From 15973548 follows 012345

8. 降べき順の数の出現

π の 800 万桁までに ついて

From 58710 follows 109876	From 898085 follows 876543
From 172609 follows 3210987	From 926549 follows 432109
From 194051 follows 109876	From 948942 follows 0987654
From 414238 follows 543210	From 956549 follows 109876
From 423827 follows 765432	From 1024825 follows 098765
From 508622 follows 098765	From 1037363 follows 109876
From 670697 follows 210987	From 1191737 follows 098765
From 721091 follows 654321	From 1216190 follows 098765
From 784142 follows 210987	From 1284870 follows 876543
From 818698 follows 321098	From 1456616 follows 210987
From 834359 follows 098765	From 1477362 follows 109876
From 881254 follows 098765	From 1543671 follows 321098

From 1594971 follows 210987
 From 1606309 follows 765432
 From 1608718 follows 210987
 From 1742050 follows 3210987
 From 1891154 follows 109876
 From 1959083 follows 765432
 From 1976880 follows 432109
 From 2092252 follows 987654
 From 2182281 follows 210987
 From 2402554 follows 109876
 From 2452977 follows 098765
 From 2523026 follows 321098
 From 2546268 follows 876543
 From 2576756 follows 765432
 From 2599938 follows 109876
 From 2630849 follows 321098
 From 2642242 follows 765432
 From 2747956 follows 876543210
 From 2785547 follows 109876
 From 2955662 follows 876543
 From 3203926 follows 432109
 From 3581756 follows 876543

From 3630044 follows 765432
 From 3853597 follows 098765
 From 4115519 follows 987654
 From 4209449 follows 321098
 From 4223988 follows 109876
 From 4338541 follows 654321
 From 4517089 follows 321098
 From 4557611 follows 765432
 From 4577752 follows 543210
 From 4623510 follows 432109
 From 4837432 follows 654321
 From 4871222 follows 321098
 From 4995395 follows 876543
 From 5229555 follows 654321
 From 5265718 follows 321098
 From 5427951 follows 109876
 From 5433274 follows 321098
 From 5661840 follows 876543
 From 5757513 follows 3210987
 From 5837090 follows 432109
 From 5913865 follows 210987
 From 5930043 follows 210987

From 5979525 follows 210987
 From 6069102 follows 321098
 From 6101603 follows 109876
 From 6104849 follows 109876
 From 6403489 follows 987654
 From 6461325 follows 321098
 From 6549913 follows 321098
 From 6654048 follows 210987
 From 6667075 follows 654321
 From 7073612 follows 543210
 From 7124971 follows 321098
 From 7281555 follows 321098
 From 7299826 follows 987654
 From 7313487 follows 765432
 From 7331233 follows 210987
 From 7392599 follows 109876
 From 7424394 follows 543210
 From 7465760 follows 210987
 From 7878284 follows 876543
 From 7879206 follows 432109

$\sqrt{2}$ の 1600 万桁までに ついて

From 85049 follows 765432
 From 144858 follows 210987
 From 255130 follows 987654
 From 287047 follows 098765
 From 389234 follows 654321
 From 541319 follows 432109
 From 668856 follows 321098
 From 686840 follows 765432
 From 736621 follows 3210987
 From 898773 follows 876543
 From 915886 follows 876543
 From 960604 follows 432109
 From 1007502 follows 210987
 From 1008703 follows 432109
 From 1028348 follows 098765
 From 1087305 follows 109876
 From 1114141 follows 987654
 From 1157503 follows 987654
 From 1161367 follows 321098
 From 1262994 follows 210987
 From 1354555 follows 765432
 From 1414886 follows 210987
 From 1595316 follows 987654
 From 1675738 follows 109876
 From 1756790 follows 876543
 From 1769580 follows 8765432
 From 1866605 follows 876543
 From 1994632 follows 321098
 From 2112770 follows 109876

From 2181560 follows 109876
 From 2190698 follows 098765
 From 2309728 follows 987654
 From 2356843 follows 987654
 From 2419521 follows 987654
 From 2638949 follows 210987
 From 2736405 follows 210987
 From 2767602 follows 2109876
 From 2823749 follows 543210
 From 2973469 follows 210987
 From 2979347 follows 876543
 From 2988033 follows 765432
 From 3045508 follows 876543
 From 3267708 follows 109876
 From 3290680 follows 654321
 From 3535076 follows 543210
 From 3740254 follows 765432
 From 3804512 follows 321098
 From 3857173 follows 876543
 From 3882176 follows 098765
 From 4114784 follows 321098
 From 4143836 follows 876543
 From 4165487 follows 2109876
 From 4187573 follows 543210
 From 4376313 follows 8765432
 From 4650455 follows 765432
 From 4839868 follows 432109
 From 4850898 follows 210987
 From 4948961 follows 987654

From 4968969 follows 765432
 From 4969527 follows 543210
 From 4988326 follows 109876
 From 5037070 follows 765432
 From 5045563 follows 210987
 From 5074122 follows 321098
 From 5357569 follows 987654
 From 5401578 follows 876543
 From 5442404 follows 9876543
 From 5480729 follows 987654
 From 5527633 follows 987654
 From 5573630 follows 765432
 From 5573929 follows 765432
 From 5650977 follows 987654
 From 5773787 follows 109876
 From 5849349 follows 765432
 From 6079305 follows 765432
 From 6114602 follows 987654
 From 6278989 follows 876543
 From 6540889 follows 210987654
 From 6568488 follows 432109
 From 6661472 follows 109876
 From 6780718 follows 543210
 From 6842879 follows 765432
 From 7209342 follows 7654321
 From 7319376 follows 321098
 From 7329740 follows 321098
 From 7360861 follows 654321
 From 7618906 follows 654321

From 7702293 follows 654321
 From 7805183 follows 109876
 From 7814163 follows 109876
 From 7859237 follows 432109
 From 7901119 follows 543210
 From 7928296 follows 654321
 From 7974974 follows 098765
 From 8025177 follows 654321
 From 8148975 follows 321098
 From 8333835 follows 9876543
 From 8381466 follows 5432109
 From 8394837 follows 654321
 From 8441309 follows 432109
 From 8468193 follows 210987
 From 8610949 follows 098765
 From 8690846 follows 543210
 From 8702730 follows 765432
 From 8742649 follows 210987
 From 8745652 follows 10987654
 From 8952003 follows 987654
 From 9012519 follows 654321
 From 9069673 follows 876543
 From 9154252 follows 098765
 From 9205229 follows 876543
 From 9309936 follows 987654
 From 9663897 follows 210987
 From 9698848 follows 321098
 From 10035235 follows 876543

From 10159480 follows 098765
 From 10463582 follows 210987
 From 10487816 follows 321098
 From 10814628 follows 987654
 From 10935099 follows 109876
 From 11061062 follows 654321
 From 11124901 follows 987654
 From 11151066 follows 109876
 From 11162545 follows 210987
 From 11376890 follows 543210
 From 11421911 follows 109876
 From 11699198 follows 543210
 From 11722733 follows 1098765
 From 11807324 follows 543210
 From 11886199 follows 210987
 From 12005664 follows 765432
 From 12012796 follows 7654321
 From 12067912 follows 098765
 From 12476208 follows 543210
 From 12567700 follows 210987
 From 12625802 follows 109876
 From 12791258 follows 543210
 From 12808434 follows 210987
 From 13252311 follows 765432
 From 13647326 follows 432109
 From 13840608 follows 654321
 From 13852864 follows 098765
 From 14000912 follows 765432

From 14004342 follows 109876
 From 14096204 follows 321098
 From 14181046 follows 321098
 From 14181160 follows 321098
 From 14388071 follows 321098
 From 14424583 follows 210987
 From 14525355 follows 543210
 From 14603061 follows 987654
 From 14620037 follows 543210
 From 14928457 follows 098765
 From 14935627 follows 210987
 From 15036249 follows 109876
 From 15041512 follows 765432
 From 15087568 follows 765432
 From 15217145 follows 432109
 From 15267813 follows 098765
 From 15325041 follows 876543
 From 15589989 follows 543210
 From 15639104 follows 543210
 From 15684584 follows 765432
 From 15736655 follows 432109
 From 15789960 follows 654321
 From 15801837 follows 876543
 From 15895519 follows 543210

√ の 1600 万桁 まじりに つなぐ

From 220747 follows 109876
 From 243836 follows 654321
 From 396683 follows 765432
 From 407922 follows 109876
 From 550328 follows 543210
 From 631613 follows 543210
 From 731387 follows 109876
 From 847731 follows 098765
 From 1027382 follows 654321
 From 1147586 follows 321098
 From 1171278 follows 543210
 From 1212214 follows 543210
 From 1623888 follows 876543
 From 1652396 follows 109876
 From 1982002 follows 876543
 From 2002478 follows 543210
 From 2467849 follows 321098
 From 2505196 follows 432109
 From 2725330 follows 543210
 From 2769412 follows 987654
 From 2787528 follows 321098
 From 2967716 follows 109876
 From 3162008 follows 432109
 From 3379530 follows 765432
 From 3404507 follows 432109
 From 3443295 follows 210987
 From 3475421 follows 987654
 From 3678803 follows 987654
 From 3789207 follows 2109876
 From 4005235 follows 765432
 From 4052677 follows 876543
 From 4289325 follows 210987
 From 4419328 follows 0987654
 From 4550701 follows 876543
 From 4696339 follows 0987654
 From 4727707 follows 321098
 From 4951383 follows 109876
 From 5158833 follows 098765
 From 5217722 follows 432109
 From 5302990 follows 109876
 From 5337289 follows 876543
 From 5452512 follows 1098765
 From 5685140 follows 543210
 From 5759086 follows 654321
 From 5765747 follows 210987

From 6338441 follows 098765
 From 6353032 follows 987654
 From 6392818 follows 4321098
 From 6433974 follows 876543
 From 6606988 follows 765432
 From 6619089 follows 109876
 From 6640998 follows 098765
 From 6681674 follows 654321
 From 6702026 follows 987654
 From 6728708 follows 2109876
 From 6796495 follows 432109
 From 6880127 follows 654321
 From 7029973 follows 543210
 From 7199145 follows 098765
 From 7205720 follows 109876
 From 7436494 follows 654321
 From 7517406 follows 210987
 From 7626872 follows 2109876
 From 7666992 follows 1098765
 From 7770281 follows 8765432
 From 7905602 follows 876543
 From 7920005 follows 765432
 From 7922063 follows 543210
 From 8016875 follows 654321
 From 8086543 follows 654321
 From 8229463 follows 210987
 From 8240376 follows 109876
 From 8264761 follows 987654
 From 8447678 follows 2109876
 From 8559165 follows 432109
 From 8596045 follows 765432
 From 8637384 follows 876543
 From 8752692 follows 54321098
 From 8906622 follows 321098
 From 9110363 follows 098765
 From 9224914 follows 321098
 From 9284526 follows 321098
 From 9456518 follows 765432
 From 9487763 follows 765432
 From 9665399 follows 987654
 From 10520162 follows 098765
 From 10605860 follows 109876
 From 10727850 follows 543210
 From 10763533 follows 654321
 From 10841141 follows 109876

From 10914390 follows 5432109
 From 10933916 follows 432109
 From 10967678 follows 210987
 From 11045130 follows 321098
 From 11048984 follows 109876
 From 11068412 follows 654321
 From 11078781 follows 543210
 From 11308411 follows 432109
 From 11429874 follows 765432
 From 11442782 follows 765432
 From 11489827 follows 543210
 From 11703742 follows 987654
 From 11864841 follows 654321
 From 11888617 follows 765432
 From 11987713 follows 321098
 From 12176183 follows 765432
 From 12400562 follows 321098
 From 12442218 follows 543210
 From 12461859 follows 432109
 From 12661649 follows 654321
 From 12719845 follows 321098
 From 12777247 follows 432109
 From 12939017 follows 321098
 From 12973527 follows 098765
 From 13099787 follows 109876
 From 13200366 follows 32109876
 From 13265557 follows 210987
 From 13349570 follows 876543
 From 13417367 follows 876543
 From 13445666 follows 432109
 From 13804249 follows 432109
 From 13965175 follows 987654
 From 14101734 follows 3210987
 From 14185064 follows 765432
 From 14347624 follows 109876
 From 14487434 follows 765432
 From 14967410 follows 432109
 From 15088370 follows 654321
 From 15124043 follows 543210
 From 15240861 follows 876543
 From 15466744 follows 876543
 From 15518391 follows 432109
 From 15933846 follows 432109

9. 同い数のくり返しの出現

 π の 800 万桁までに つな

From 762 follows 6-multiple number '9'
 From 193034 follows 6-multiple number '9'
 From 222299 follows 6-multiple number '8'
 From 244453 follows 6-multiple number '5'
 From 252499 follows 6-multiple number '6'
 From 253209 follows 6-multiple number '5'
 From 255945 follows 6-multiple number '1'
 From 399579 follows 6-multiple number '7'
 From 419997 follows 6-multiple number '5'
 From 452071 follows 6-multiple number '7'
 From 710100 follows 7-multiple number '3'
 From 828499 follows 6-multiple number '4'
 From 963024 follows 6-multiple number '2'
 From 1006927 follows 6-multiple number '7'
 From 1129019 follows 6-multiple number '3'
 From 1264270 follows 6-multiple number '4'
 From 1637080 follows 6-multiple number '2'
 From 1691163 follows 6-multiple number '4'
 From 1699927 follows 6-multiple number '0'
 From 1722776 follows 7-multiple number '9'
 From 1795773 follows 6-multiple number '2'
 From 1985813 follows 6-multiple number '9'
 From 2309218 follows 6-multiple number '7'
 From 2328783 follows 6-multiple number '0'
 From 2376567 follows 6-multiple number '7'
 From 2418533 follows 6-multiple number '8'
 From 2523356 follows 6-multiple number '2'
 From 2609392 follows 6-multiple number '0'
 From 2645268 follows 6-multiple number '1'
 From 2878443 follows 6-multiple number '9'
 From 3019042 follows 6-multiple number '8'
 From 3062881 follows 6-multiple number '9'
 From 3147134 follows 6-multiple number '8'
 From 3204765 follows 7-multiple number '3'
 From 3218870 follows 6-multiple number '1'
 From 3280219 follows 6-multiple number '4'
 From 3311569 follows 6-multiple number '4'
 From 3346228 follows 7-multiple number '7'
 From 3389380 follows 7-multiple number '9'
 From 3474036 follows 6-multiple number '2'
 From 3517236 follows 7-multiple number '5'
 From 3529731 follows 6-multiple number '9'
 From 3552343 follows 6-multiple number '4'

From 3604524 follows 6-multiple number '8'
 From 3775287 follows 7-multiple number '7'
 From 3794572 follows 7-multiple number '0'
 From 3813777 follows 6-multiple number '6'
 From 4098542 follows 6-multiple number '3'
 From 4213896 follows 6-multiple number '6'
 From 4313727 follows 7-multiple number '9'
 From 4431395 follows 6-multiple number '7'
 From 4640063 follows 6-multiple number '3'
 From 4657555 follows 7-multiple number '1'
 From 4722613 follows 7-multiple number '8'
 From 5107308 follows 6-multiple number '6'
 From 5130874 follows 6-multiple number '1'
 From 5168161 follows 6-multiple number '5'
 From 5267503 follows 6-multiple number '7'
 From 5425806 follows 6-multiple number '1'
 From 5463417 follows 6-multiple number '2'
 From 5466169 follows 7-multiple number '9'
 From 5524958 follows 6-multiple number '3'
 From 5716972 follows 6-multiple number '8'
 From 5765299 follows 6-multiple number '8'
 From 5803105 follows 6-multiple number '2'
 From 5892331 follows 6-multiple number '5'
 From 5961931 follows 6-multiple number '1'
 From 6052100 follows 6-multiple number '7'
 From 6252652 follows 6-multiple number '4'
 From 6314342 follows 6-multiple number '7'
 From 6381473 follows 6-multiple number '5'
 From 6428161 follows 6-multiple number '8'
 From 6443216 follows 6-multiple number '8'
 From 6653783 follows 6-multiple number '1'
 From 6885738 follows 6-multiple number '4'
 From 6951812 follows 6-multiple number '9'
 From 7024615 follows 6-multiple number '2'
 From 7114978 follows 6-multiple number '6'
 From 7257528 follows 6-multiple number '0'
 From 7282004 follows 6-multiple number '4'
 From 7298585 follows 6-multiple number '9'
 From 7449552 follows 6-multiple number '5'
 From 7670945 follows 6-multiple number '6'
 From 7747736 follows 6-multiple number '8'
 From 7764272 follows 6-multiple number '8'
 From 7820866 follows 7-multiple number '8'

 $\frac{1}{\sqrt{2}}$ の 1600 万桁までに つな

From 58158 follows 6-multiple number '9'
 From 158810 follows 6-multiple number '0'
 From 226697 follows 6-multiple number '3'
 From 230946 follows 7-multiple number '8'
 From 688575 follows 6-multiple number '5'
 From 764749 follows 6-multiple number '8'
 From 790100 follows 6-multiple number '6'
 From 969837 follows 6-multiple number '8'
 From 1237292 follows 6-multiple number '0'
 From 1573689 follows 6-multiple number '8'
 From 1700566 follows 6-multiple number '6'
 From 2391741 follows 6-multiple number '0'
 From 2500026 follows 6-multiple number '6'
 From 3077347 follows 6-multiple number '6'
 From 3121446 follows 6-multiple number '9'
 From 3379337 follows 6-multiple number '7'
 From 3441324 follows 6-multiple number '2'
 From 3459821 follows 6-multiple number '5'
 From 3944334 follows 6-multiple number '3'
 From 4020965 follows 6-multiple number '8'
 From 4325478 follows 6-multiple number '9'
 From 4535824 follows 6-multiple number '9'
 From 4602784 follows 7-multiple number '3'

From 4763614 follows 6-multiple number '4'
 From 4888230 follows 6-multiple number '9'
 From 5054255 follows 6-multiple number '5'
 From 5081123 follows 6-multiple number '6'
 From 5173380 follows 6-multiple number '0'
 From 5219360 follows 6-multiple number '2'
 From 5301177 follows 6-multiple number '4'
 From 5505907 follows 6-multiple number '2'
 From 5531370 follows 6-multiple number '7'
 From 5578911 follows 6-multiple number '7'
 From 5586460 follows 6-multiple number '3'
 From 5644970 follows 6-multiple number '5'
 From 5719346 follows 6-multiple number '7'
 From 5780708 follows 6-multiple number '0'
 From 5803364 follows 6-multiple number '6'
 From 5817311 follows 6-multiple number '7'
 From 6081356 follows 7-multiple number '7'
 From 6160611 follows 6-multiple number '9'
 From 6195039 follows 6-multiple number '1'
 From 6552807 follows 7-multiple number '4'
 From 6900121 follows 6-multiple number '2'
 From 6923031 follows 6-multiple number '3'
 From 7096351 follows 6-multiple number '8'

From 7125803	follows 6-multiple number '2'	From 11439570	follows 6-multiple number '7'
From 7157822	follows 6-multiple number '8'	From 11495882	follows 6-multiple number '4'
From 7162671	follows 6-multiple number '2'	From 11496000	follows 7-multiple number '8'
From 7267824	follows 6-multiple number '3'	From 11668194	follows 6-multiple number '4'
From 7322517	follows 6-multiple number '1'	From 11770489	follows 6-multiple number '3'
From 7337050	follows 6-multiple number '4'	From 11785952	follows 6-multiple number '4'
From 7363068	follows 6-multiple number '9'	From 11851004	follows 6-multiple number '4'
From 7461068	follows 6-multiple number '9'	From 11870547	follows 6-multiple number '4'
From 7493505	follows 6-multiple number '5'	From 11984832	follows 6-multiple number '5'
From 7512915	follows 6-multiple number '4'	From 12034642	follows 7-multiple number '0'
From 7543086	follows 6-multiple number '2'	From 12509409	follows 6-multiple number '6'
From 7589211	follows 6-multiple number '5'	From 12768209	follows 6-multiple number '9'
From 7662662	follows 6-multiple number '0'	From 12800545	follows 6-multiple number '5'
From 7796982	follows 6-multiple number '5'	From 12853700	follows 6-multiple number '0'
From 8082028	follows 7-multiple number '2'	From 13282375	follows 6-multiple number '1'
From 8085488	follows 6-multiple number '5'	From 13308958	follows 6-multiple number '0'
From 8368029	follows 6-multiple number '9'	From 13437031	follows 6-multiple number '0'
From 8465418	follows 6-multiple number '3'	From 13463798	follows 7-multiple number '8'
From 8730449	follows 6-multiple number '4'	From 13498089	follows 6-multiple number '0'
From 8884316	follows 6-multiple number '6'	From 13813969	follows 6-multiple number '5'
From 9105310	follows 6-multiple number '6'	From 13848084	follows 6-multiple number '0'
From 9117419	follows 6-multiple number '2'	From 13968170	follows 7-multiple number '3'
From 9284389	follows 6-multiple number '4'	From 14007333	follows 6-multiple number '1'
From 9325562	follows 6-multiple number '9'	From 14230427	follows 6-multiple number '5'
From 9344724	follows 6-multiple number '7'	From 14285848	follows 6-multiple number '1'
From 9391970	follows 6-multiple number '9'	From 14346237	follows 6-multiple number '0'
From 9395430	follows 6-multiple number '6'	From 14420656	follows 7-multiple number '2'
From 9557468	follows 6-multiple number '6'	From 14464430	follows 6-multiple number '5'
From 9844307	follows 6-multiple number '1'	From 14475063	follows 6-multiple number '6'
From 9995339	follows 6-multiple number '7'	From 14719174	follows 6-multiple number '5'
From 10082242	follows 6-multiple number '1'	From 14723264	follows 6-multiple number '4'
From 10218821	follows 6-multiple number '4'	From 14914739	follows 7-multiple number '4'
From 10261126	follows 6-multiple number '0'	From 15053085	follows 7-multiple number '2'
From 10273757	follows 6-multiple number '0'	From 15285085	follows 6-multiple number '2'
From 10327658	follows 6-multiple number '2'	From 15349879	follows 6-multiple number '4'
From 10577693	follows 6-multiple number '5'	From 15480528	follows 6-multiple number '4'
From 10659021	follows 6-multiple number '2'	From 15566325	follows 6-multiple number '0'
From 10685223	follows 6-multiple number '8'	From 15584315	follows 6-multiple number '7'
From 10777791	follows 6-multiple number '9'	From 15700625	follows 6-multiple number '7'
From 10796512	follows 6-multiple number '4'	From 15711563	follows 6-multiple number '6'
From 10955357	follows 6-multiple number '1'	From 15735615	follows 6-multiple number '8'
From 10975105	follows 7-multiple number '8'	From 15846543	follows 6-multiple number '1'

√2 の 1600 万桁までの桁

From 32413	follows 6-multiple number '4'	From 4088447	follows 6-multiple number '3'
From 93648	follows 6-multiple number '8'	From 4100767	follows 6-multiple number '2'
From 109812	follows 6-multiple number '0'	From 4308536	follows 6-multiple number '6'
From 158809	follows 7-multiple number '0'	From 4535824	follows 6-multiple number '9'
From 226697	follows 6-multiple number '6'	From 4602783	follows 8-multiple number '6'
From 230946	follows 6-multiple number '7'	From 4749352	follows 6-multiple number '7'
From 250659	follows 6-multiple number '3'	From 4763613	follows 6-multiple number '8'
From 537670	follows 6-multiple number '0'	From 5173380	follows 6-multiple number '0'
From 648166	follows 6-multiple number '2'	From 5219360	follows 6-multiple number '4'
From 688575	follows 6-multiple number '1'	From 5440611	follows 6-multiple number '9'
From 790099	follows 6-multiple number '3'	From 5522407	follows 6-multiple number '0'
From 969836	follows 7-multiple number '7'	From 5531370	follows 6-multiple number '5'
From 1667161	follows 6-multiple number '7'	From 5578911	follows 6-multiple number '5'
From 1742707	follows 6-multiple number '7'	From 5586459	follows 6-multiple number '6'
From 1857880	follows 6-multiple number '0'	From 5719345	follows 7-multiple number '5'
From 2057118	follows 6-multiple number '2'	From 5792664	follows 6-multiple number '9'
From 2294853	follows 6-multiple number '8'	From 5803363	follows 7-multiple number '3'
From 2339207	follows 6-multiple number '4'	From 5844028	follows 6-multiple number '1'
From 2369251	follows 6-multiple number '2'	From 6070551	follows 6-multiple number '0'
From 2391741	follows 6-multiple number '0'	From 6081355	follows 7-multiple number '5'
From 2503943	follows 6-multiple number '1'	From 6204590	follows 6-multiple number '2'
From 3028664	follows 6-multiple number '8'	From 6335100	follows 6-multiple number '9'
From 3077347	follows 6-multiple number '3'	From 6552807	follows 7-multiple number '8'
From 3091738	follows 6-multiple number '8'	From 6560151	follows 6-multiple number '1'
From 3121446	follows 6-multiple number '9'	From 6663494	follows 6-multiple number '3'
From 3172420	follows 6-multiple number '9'	From 6900121	follows 6-multiple number '4'
From 3287086	follows 6-multiple number '3'	From 7313952	follows 6-multiple number '5'
From 3441324	follows 6-multiple number '4'	From 7326411	follows 6-multiple number '1'
From 3459820	follows 6-multiple number '1'	From 7337050	follows 6-multiple number '8'
From 3944334	follows 6-multiple number '6'	From 7363068	follows 6-multiple number '9'
From 3997903	follows 6-multiple number '3'	From 7455257	follows 6-multiple number '5'

From 7461068 follows 6-multiple number '9'	From 11668194 follows 6-multiple number '8'
From 7493505 follows 6-multiple number '1'	From 11770489 follows 6-multiple number '6'
From 7536125 follows 6-multiple number '3'	From 11792270 follows 6-multiple number '9'
From 7543483 follows 6-multiple number '6'	From 11870547 follows 6-multiple number '8'
From 7601824 follows 6-multiple number '3'	From 12034642 follows 6-multiple number '0'
From 8082028 follows 7-multiple number '4'	From 12057829 follows 6-multiple number '4'
From 8085488 follows 6-multiple number '1'	From 12677693 follows 6-multiple number '9'
From 8194056 follows 6-multiple number '4'	From 12687224 follows 6-multiple number '6'
From 8368029 follows 6-multiple number '9'	From 12768209 follows 6-multiple number '9'
From 8465418 follows 6-multiple number '6'	From 12800545 follows 6-multiple number '1'
From 8884316 follows 6-multiple number '3'	From 13282375 follows 6-multiple number '2'
From 8971370 follows 6-multiple number '8'	From 13460885 follows 6-multiple number '5'
From 9031628 follows 6-multiple number '6'	From 13463798 follows 6-multiple number '7'
From 9105310 follows 6-multiple number '3'	From 13465242 follows 6-multiple number '2'
From 9117419 follows 6-multiple number '4'	From 13478601 follows 6-multiple number '0'
From 9325562 follows 6-multiple number '9'	From 13486984 follows 6-multiple number '4'
From 9344724 follows 6-multiple number '5'	From 13498088 follows 6-multiple number '0'
From 9391969 follows 7-multiple number '9'	From 13968170 follows 7-multiple number '6'
From 9504913 follows 6-multiple number '1'	From 14139078 follows 6-multiple number '8'
From 9557468 follows 6-multiple number '3'	From 14176355 follows 6-multiple number '3'
From 9868490 follows 6-multiple number '2'	From 14230427 follows 6-multiple number '1'
From 9995339 follows 6-multiple number '5'	From 14285848 follows 6-multiple number '2'
From 10218821 follows 6-multiple number '8'	From 14346237 follows 6-multiple number '0'
From 10273756 follows 7-multiple number '0'	From 14420656 follows 6-multiple number '4'
From 10291319 follows 6-multiple number '6'	From 14426778 follows 6-multiple number '2'
From 10482581 follows 6-multiple number '8'	From 14464430 follows 6-multiple number '1'
From 10577693 follows 6-multiple number '1'	From 14475063 follows 6-multiple number '3'
From 10604978 follows 6-multiple number '8'	From 14723263 follows 7-multiple number '8'
From 10611195 follows 6-multiple number '8'	From 14914739 follows 6-multiple number '8'
From 10659021 follows 6-multiple number '4'	From 14961961 follows 6-multiple number '9'
From 10735692 follows 6-multiple number '7'	From 15053085 follows 7-multiple number '4'
From 10777791 follows 6-multiple number '9'	From 15305693 follows 6-multiple number '5'
From 10796512 follows 6-multiple number '8'	From 15349878 follows 6-multiple number '8'
From 10955357 follows 6-multiple number '2'	From 15480528 follows 6-multiple number '8'
From 10975105 follows 6-multiple number '7'	From 15566325 follows 6-multiple number '0'
From 10975884 follows 6-multiple number '7'	From 15584314 follows 6-multiple number '5'
From 11496000 follows 6-multiple number '7'	From 15711563 follows 6-multiple number '3'
From 11531163 follows 6-multiple number '7'	From 15846543 follows 6-multiple number '2'

10. 終りに

今回の調査・検定で使用した子-夕は、MTを送る2 unit だければ、コト-を差しあはせることが可能である。πの 2^{25} 桁計算は、あと一年ほどは不可能である。しかし、 $\frac{1}{\sqrt{2}}$, $\sqrt{2}$ の 2^{25} ~ 2^{26} 桁計算は可能であるから、近いうちに試み、検定・統計子-夕を更新したくなるであろう。

11. 文献

- 1) Y. Tamura and Y. Kanada, "Calculation of pi to 4,194,293 Decimals Based on the Gauss-Legendre Algorithm," CCUT-TR-83-01, Computer Centre, University of Tokyo.
- 2) J. Dukta, "The Square Root of 2 to 1,000,000 Decimals," Math. Comp. 25 (1971) 927-930.
- 3) R.K. Pathria, "A Statistical Study of Randomness Among the First 10,000 Digits of pi," Math. Comp. 16 (1962) 188-197.
- 4) K. Miyoshi and K. Nakayama, "Calculation of pi to 2,000,000 Decimals," Proc. 23-rd IPSJ Annual Conf., pp. 941-942 (Oct. 1981).