

Program Description I

Program Title RANDOM NUMBERSContributor's Name PATRICE HEONAddress 190, 2^{me}, VILLE ST-PIERRECity MONTREAL, QUEBEC State CANADA Zip Code HPR 1L6

Program Description, Equations, Variables THIS PROGRAM PROVIDES SEQUENCES OF RANDOM NUMBER UNIFORMLY DISTRIBUTED BETWEEN GIVEN LIMITS. ALGORITHM IS DONE IN THE WAY TO CUT ANY LOOP IN THE SEQUENCE NUMBER.

THE RANDOM GENERATOR :

$$R = \left[\left[\text{seed}^2 / 100 \right] \text{INT} / 10000 \right] \text{FRAC} \times 10000$$

R IS THEN TRANSLATED INTO THE GIVEN LIMITS.

PROGRAM ACCEPTS ANY ^{POSITIVE} SEED, BUT WORKS WITH SEED BETWEEN 1000 AND 9999. THE PROCESS TIME TO RESET INITIAL SEED TO WORKING SEED IS DIRECTLY PROPORTIONAL TO THE RANGE BETWEEN THEM.

TO KILL LOOPS, A SPECIAL SUBROUTINE AUTOMATICALLY CHANGES THE SEED AT EACH NEW NUMBER AND SHIFTS IT RANDOMLY TOO.

Operating Limits and Warnings FOR EXTREME SEED $[10^{-75}$ OR $10^{75}]$ FOR EXAMPLE, THE PROGRAM CAN'T FAILED, BUT ANY WAY THE PROCESS TIME IS QUITE LONG.

This program has been verified only with respect to the numerical example given in *Program Description II*. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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Program Description II

Sketch(es)

Sample Problem(s)

GETS 5 RANDOM NUMBERS BETWEEN 1 AND 100

SEED = 5230

SOLUTION: READ BOTH SIDES OF CARD 1 AND 2

1 [ENT] 100 [ENT] 5 → [D] → 1.

5230 [A] → 95, 9, 20, 68, 4

DO IT AGAIN, SAME LIMITS, SAME SEED.

5230 [A] → 47, 65, 16, 91, 97

NOTE: THE AVERAGE OF THE 10 NUMBERS GOTTEN
IS 51 AND STANDARD DEVIATION IS 37.
THAT'S LOOK OK ON A SO SMALL SET OF DATA

Solution(s)

Reference(s)

[illegible]

03837D

Program Listing I

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBL1	21 11	ENTER	057	GT01	22 05	
002	F28	16-51		058	*LBL1	21 01	
003	ST03	35 03	A.D.m	059	ROL0	36 00	
004	F28	16-51		060	+	-55	
005	R4	-31		061	1	01	
006	.	-62		062	7	07	
007	5	05		063	ST+0	35-55 00	
008	+	-55		064	R4	-31	
009	ST08	35 12		065	GT06	22 06	
010	R4	-31		066	*LBL2	21 02	
011	.	-62		067	F28	16-51	
012	4	04		068	ROL1	36 01	
013	9	09		069	1	01	
014	-	-43		070	7	07	
015	ST00	35 13		071	ST+1	35-55 01	
016	RT1	24		072	F28	16-51	
017	*LBL4	21 11	WORK	073	R4	-31	
018	ST08	35 03		074	+	-55	
019	F28	16-51		075	GT06	22 06	
020	ROL3	36 03		076	*LBL3	21 03	
021	F28	16-51		077	ROL1	36 01	
022	ST0A	35 11		078	+	-55	
023	ROL8	36 08		079	1	01	
024	X=00	16-43		080	7	07	
025	ROL0	36 14		081	ST+1	35-55 01	
026	ROL4	36 04	Seed $> 10^4$?	082	R4	-31	
027	X4Y2	16-35		083	GT06	22 06	
028	GSEC	23 13		084	*LBL4	21 04	
029	ROL6	36 06		085	ROL2	36 02	
030	ROL5	36 05		086	+	-55	
031	X4Y	-41	Seed $\leq 10^3$?	087	1	01	
032	X4Y2	16-35		088	7	07	
033	GSEB	23 12		089	ST+2	35-55 02	
034	ROL8	36 08		090	R4	-31	
035	*LBL5	21 15	RANDOM.	091	GT06	22 06	
036	ROL8	36 08		092	*LBL5	21 05	
037	ROL6	36 06	SHIFTED	093	ROL3	36 03	
038	=	-24	GENERATION	094	+	-55	
039	INT	16 34		095	1	01	
040	ROL6	36 06		096	7	07	
041	=	-24		097	ST+3	35-55 03	
042	FRC	16 44		098	R4	-31	
043	ROL6	36 06		099	*LBL6	21 06	
044	x	-35		100	X2	53	
045	1	01		101	ROL7	36 07	
046	+	-55		102	=	-24	
047	2	02		103	INT	16 34	
048	=	-24		104	ROL4	36 04	
049	RND	16 24		105	=	-24	
050	ROL1	36 46		106	FRC	16 44	
051	+	-55		107	ROL4	36 04	
052	2	02		108	x	-35	
053	=	-24		109	ST08	35 08	
054	INT	16 34		110	ROL8	36 12	
055	ST01	35 46		111	ROL0	36 13	
056	ROL8	36 08		112		-45	

REGISTERS

663	848	285	424	10000	1000	10	100	9650 SEED	9999
S0	S1 71.14	S2 7.25602	S3 1	S4	S5	S6	S7	S8	S9
A	B	C	D	E	F	G	H	I	J
m	D	A	1105910	3141	1-5				

RANDOM
GENERATOR

03837D

Program Listing II

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
113	A	-35		159	0	00	
114	RCL9	36 09		170	ST02	35 02	
115	÷	-24		171	RTN	24	
116	RCL0	36 13					
117	+	-55					
118	P2S	16-51					
119	ST02	35 02					
120	ABS	16 31					
121	.	-62					
122	4	04					
123	9	09					
124	X>Y?	16-34		180			
125	GSE9	23 09					
126	RCL2	36 02					
127	P2S	16-51					
128	DSP0	-63 00					
129	PSE	16 51					
130	RCLA	36 11					
131	1	01					
132	-	-45					
133	ST0A	35 11					
134	X=0?	16-43		190			
135	RTN	24					
136	GTOE	22 15					
137	*LBLP	21 12	See 103				
138	ENT1	-21					
139	ABS	16 31					
140	LOG	16 32					
141	ABS	16 31					
142	PI	16-24					
143	+	-55					
144	X	-35		200			
145	RCL5	36 05					
146	X*Y	-41					
147	X<Y?	16-35					
148	GTOB	22 12					
149	*LBL7	21 07					
150	RCL4	36 04					
151	X*Y	-41					
152	ST08	35 08					
153	X<Y?	16-35					
154	RTN	24		210			
155	PI	16-24					
156	÷	-24					
157	GTO7	22 07					
158	*LBLC	21 13	See 104				
159	RCL6	36 15					
160	÷	-24					
161	RCL4	36 04					
162	X*Y	-41					
163	X>Y?	16-34					
164	GTOC	22 13		220			
165	ST08	35 08					
166	X*Y	-41					
167	RTN	24	OUT				
168	*LBL9	21 09					

LABELS					FLAGS	SET STATUS		
W O A K	B	C	D	E		FLAGS	TRIG	DISP
a	b	c	d	e	1	ON OFF 0 <input type="checkbox"/> <input checked="" type="checkbox"/>	DEG <input checked="" type="checkbox"/>	FIX <input checked="" type="checkbox"/>
0	1	2	3	4	2	1 <input type="checkbox"/> <input checked="" type="checkbox"/>	GRAD <input type="checkbox"/>	SCI <input type="checkbox"/>
5	6	7	8	9	3	2 <input type="checkbox"/> <input checked="" type="checkbox"/>	RAD <input type="checkbox"/>	ENG <input type="checkbox"/>
						3 <input type="checkbox"/> <input checked="" type="checkbox"/>		n <u>0</u>