

Program Description I

Program Title Daytona 500
 Contributor's Name Bruce Hansen
 Address 220 Iris Street
 City Lansing State MI Zip Code 48917

Program Description, Equations, Variables Program races from 1-12 cars with horsepower and type of tires specified by the user. The first car to reach 500 miles with out crashing is the winner.

Equations used are:

Chance of crash

$$4 - [\ln(\text{speed}/3)]$$

Speed

$$7.5(\sqrt{350 + \text{horsepower}/2} - \text{tires} + \text{random})$$

range on tire

$$70(\text{tires}) - \text{horsepower}/15$$

Operating Limits and Warnings If all of the cars have crashed the program will run a continuous loop and won't stop. The more cars running the longer the race takes to run. Trying to run more than 12 cars will result in an Error.

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) Race 3 cars with horsepowers and tires as follows:

car # 11 -	700 horsepower	1 tires
car # 6 -	678 horsepower	2 tires
car # 3 -	653 horsepower	3 tires

Solution(s) Keystrokes

3.947 [A], 11 (displayed), 700, 1, 6 (displayed), 678, 2, 3 (displayed), 653, 3,
 11 (displayed), 2, 11 (displayed), 78.8 (displayed), 6 (dis.), 76.3 (dis.), 3 (dis.), 72.5 (dis.),
 11 (displayed), 155.9 (dis.), 6 (dis.), 3, 6 (dis.), 149, 1 (dis.), 3 (dis.), 146.7 (dis.), 11 (dis.), 3, 11 (dis.),
 229.9 (dis.), 6 (dis.), 222 (dis.), 3 (dis.), 178 (dis.), 146.7 (dis.) [car #3 has crashed], 11 (dis.), 304.5 (dis.),
 6 (dis.), 296.2 (dis.), 11 (dis.), 378.3 (dis.), 6 (dis.), 1, 6 (dis.), 366.6 (dis.), 11 (dis.), 2, 11 (dis.), 450.7 (dis.),
 6 (dis.), 1, 6 (dis.), 442.3 (dis.), 11 (dis.), 181 (dis.), 450.7 (dis.) [car #11 has crashed at 181 mph after 450.7 miles],
 6 (dis.), 1, 6 (dis.), 500 (dis.) execution has stopped, go to the second card to interpret the
 results.

Reference(s)

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	* f LBL A	31 25 11			.	83	
	h F? 2	35 71 02			3	03	
	GTO f a	22 31 11			g X≤Y	32 71	
	f GSB 8	31 22 08		060	f GSB 4	31 22 04	
	RCL(i)	34 24			g GSB f e	32 22 15	
	f GSB 9	31 22 09			f GSB 8	31 22 08	
	f INT	31 83			5	05	
	f X=0	31 51			0	00	
	GTO f c	22 31 13			0	00	
010	3	03			RCL(i)	34 24	
	÷	81			g FRAC	32 83	
	f LN	31 52			EEX	43	
	4	04			6	06	
	-	51		070	X	71	
	f GSB 2	31 22 02			g X>Y	32 81	
	g X≤Y	32 71			f GSB 6	31 22 06	
	GTO 5	22 05			h PAUSE	35 72	
	RCL(i)	34 24			f GSB 9	31 22 09	
	2	02			* g LBL f c	32 25 13	
020	÷	81			f DSZ	31 33	
	3	03			GTO A	22 11	
	5	05			CL X	44	
	0	00			h F? 0	35 71 00	
	+	61		080	h RTN	35 22	
	f √x	31 54			f GSB 7	31 22 07	
	RCL(i)	34 24			GTO A	22 11	
	g FRAC	32 83			* g LBL f a	32 25 11	
	1	01			STO 0	33 00	
	0	00			f INT	31 83	
030	X	71			h STL	35 33	
	-	51			* f LBL 0	31 25 00	
	f GSB 2	31 22 02			g GSB f e	32 22 15	
	+	61			h PAUSE	35 72	
	7	07		090	0	00	
	.	83			h PAUSE	35 72	
	5	05			h XZY	35 52	
	X	71			h RV	35 53	
	f INT	31 83			1	01	
	f GSB 8	31 22 08			0	00	
040	RCL(i)	34 24			÷	81	
	3 FRAC	32 83			+	61	
	+	61			STO(i)	33 24	
	STO(i)	33 24			f GSB 1	31 22 01	
	2	02		100	f GSB 8	31 22 08	
	4	04			1	01	
	EEX	43			STO(i)	33 24	
	5	05			f GSB 9	31 22 09	
	÷	81			f DSZ	31 33	
	STO+(i)	33 61 24			GTO 0	22 00	
050	f GSB 9	31 22 09			f GSB 7	31 22 07	
	STO-(i)	33 51 24			GTO A	22 11	
	RCL(i)	34 24			* f LBL 4	31 25 04	
	EEX	43			g GSB f e	32 22 15	
	3	03		110	h PAUSE	35 72	
	X	71			f X=0	31 51	
	3 FRAC	32 83			2	02	

REGISTERS

0 n.s	1 2 registers are used for each car	2	3	4	5	6	7	8	9
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
A	B	C	D	E	I	used			

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
	↑	41			h RTN	35 22	
	1	01		170	* F LBL 9	31 25 09	
	0	00			h RCI	35 34	
	÷	81			RCL O	34 00	
	RCL(i)	34 24			F INT	31 83	
	F INT	31 83			-	51	
	+	61			h STE	35 33	
120	STO (i)	33 24			h RV	35 53	
	F GSB 1	31 22 01			h RTN	35 22	
	F GSB 8	31 22 08			* F LBL 7	31 25 07	
	RCL(i)	34 24			RCL O	34 00	
	6	06		180	F INT	31 83	
	EEX	43			h STI	35 33	
	7	07			h RTN	35 22	
	÷	81			* F LBL 2	31 25 02	
	STO-(i)	33 51 24			RCL O	34 00	
	F GSB 9	31 22 09			h TT	35 73	
130	h RTN	35 22			+	61	
	* 9 LBL Fe	32 25 15			9 X ²	32 54	
	h RCI	35 34			9 FRAC	32 83	
	9 X ²	32 54			RCL O	34 00	
	2	02		190	F INT	31 83	
	+	61			+	61	
	h PAUSE	35 72			STO O	33 00	
	CLX	44			9 FRAC	32 83	
	h RTN	35 22			h RTN	35 22	
	* F LBL 1	31 25 01			* F LBL 5	31 25 05	
140	RCL(i)	34 24			9 GSB Fe	32 22 15	
	EEX	43			F GSB 8	31 22 08	
	3	03			RCL(i)	34 24	
	X	71			h PAUSE	35 72	
	RCL(i)	34 24		200	9 FRAC	32 83	
	9 FRAC	32 83			STO(i)	33 24	
	.	83			EEX	43	
	7	07			6	06	
	X	71			X	71	
	RCL(i)	34 24			h PAUSE	35 72	
150	1	01			F GSB 9	31 22 09	
	5	05			GTO FC	22 31 13	
	EEX	43			* F LBL 6	31 25 06	
	3	03			h SFO	35 51 00	
	÷	81		210	5	05	
	-	51			0	06	
	+	61			0	00	
	EEX	43			h RTN	35 22	
	3	03					
	÷	81					
160	STO (i)	33 24					
	h RTN	35 22					
	* F LBL 8	31 25 08					
	h RCI	35 34					
	RCL O	34 00					
	F INT	31 83		220			
	+	61					
	h STI	35 33					
	h RV	35 53					

LABELS					FLAGS	SET STATUS		
A RACE	B	C	D	E	⁰ Finish	FLAGS	TRIG	DISP
a n.s stored	b	c used	d	e car #	¹ none	ON OFF		
⁰ initial values	¹ range	² random #	³	⁴ pit stop	² initialize	0 <input type="checkbox"/> <input checked="" type="checkbox"/>	DEG <input checked="" type="checkbox"/>	FIX <input checked="" type="checkbox"/>
⁵ crash	⁶ finish race	⁷ first car input	⁸ used	⁹ used	³ none	1 <input type="checkbox"/> <input checked="" type="checkbox"/>	GRAD <input type="checkbox"/>	SCI <input type="checkbox"/>
						2 <input checked="" type="checkbox"/> <input type="checkbox"/>	RAD <input type="checkbox"/>	ENG <input type="checkbox"/>
						3 <input type="checkbox"/> <input checked="" type="checkbox"/>		n <u>2</u>

Program Description I

Program Title Daytona 500 (card II)

Contributor's Name Bruce Hansen

Address 220 Iris Street

City Lansing State Michigan Zip Code 48917

Program Description, Equations, Variables Program determines the speed, number of miles behind the winner and the winner.

Operating Limits and Warnings The more cars running, the longer the execution time (not long).

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Program Description II

Sketch(es)

Sample Problem(s) (continuing from card I sample run)

Find the winner, speed of each car, and miles behind the winner.

Solution(s) Keystrokes

[A] →

11(dis), -67.3(dis), 0(dis.)

6(dis), 0(dis.), 189(dis.)

3(dis.), -371.3(dis.), 0(dis.)

this means car #11 was 67.3 miles behind with no speed or he crashed. Car #6 was 0 miles behind or, in other words, was the winner at 189 mph. Car #3 was 371.3 miles back and he also crashed.

Reference(s)

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	* F LBL A	31 25 11			h RV	35 53	
	F GSB 7	31 22 07			GTO 1	22 01	
	* F LBL 0	31 25 00			* F LBL 9	31 25 09	
	F GSB 8	31 22 08		060	h RCI	35 34	
	RCL(i)	34 24			RCL 0	34 00	
	9 FRAC	32 83			F INT	31 83	
	EEX	43			-	51	
	6	06			h STI	35 33	
	X	71			h RV	35 53	
010	RCL(i)	34 24			h RTN	35 22	
	F INT	31 83			* F LBL 7	31 25 07	
	STO(i)	33 24			RCL 0	34 00	
	h RV	35 53			F INT	31 83	
	F GSB 9	31 22 09		070	h STI	35 33	
	STO(i)	33 24			h RTN	35 22	
	F DSZ	31 33					
	GTO 0	22 00					
	F GSB 7	31 22 07					
	GTO 2	22 02					
020	* F LBL 1	31 25 01					
	STG - (i)	33 51 24					
	F DSZ	31 33					
	GTO 1	22 01					
	F GSB 7	31 22 07		080			
	* F LBL 2	31 25 02					
	RCL(i)	34 24					
	F X > 0	31 81					
	GTO 3	22 03					
	F DSZ	31 33					
030	GTO 2	22 02					
	F GSB 7	31 22 07					
	* F LBL 4	31 25 04					
	h RCI	35 34					
	9 X ²	32 54		090			
	2	02					
	+	61					
	F -X-	31 84					
	RCL(i)	34 24					
	h PAUSE	35 72					
040	F GSB 8	31 22 08					
	RCL(i)	34 24					
	h PAUSE	35 72					
	F GSB 9	31 22 09					
	F DSZ	31 33		100			
	GTO 4	22 04					
	h RTN	35 22					
	* F LBL 8	31 25 08					
	h RCI	35 34					
	RCL 0	34 00					
050	F INT	31 83					
	T	61					
	h STI	35 33					
	h RV	35 53					
	h RTN	35 22		110			
	F LBL 3	31 25 03					
	F GSB 7	31 22 07					

REGISTERS

0	1	2	3	4	5	6	7	8	9
n, S	same registers used as card I								
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
A	B	C	D	E	I				

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
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[illegible]

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