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DECUS NO.	FOCAL8-92
TITLE	FOCAL HORSERACE FOR THE PDP-8 (8K) COMPUTER
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DATE	April 16, 1970
SOURCE LANGUAGE	FOCAL

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FOCAL HORSERACE FOR THE PDP-8 (8K) COMPUTER

DECUS Program Library Write-up

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II. OPERATING INSTRUCTIONS

A. FOCAL (You must have an 8K PDP-8 computer)

1. Input RIM loader.
2. Use RIM loader to input BIN loader (placing BIN into the upper 4K).
3. Use BIN loader to load 4K FOCAL into lower core.
4. Start FOCAL (at 200_g) and answer the two questions "NO" and "NO", i.e., save no extended functions.
5. Stop FOCAL and use BIN loader to load 8K overlay into lower core.
6. Restart FOCAL (at 200_g).

B. HORSERACE

1. Load in the ASCII source tape through FOCAL via low speed or high speed reader.
2. Start the program by typing G ↵ (where ↵ is carriage return key).
3. Read initial instructions and place bets as indicated, answering "NO" to the question "More bets?" when all bets have been placed.
4. Sit back and watch the description of the race spew forth.

III. DISCUSSION ON OPERATION PHILOSOPHY OF PROGRAM

The initial printout of the program lists the 9 horse selection table, with the odds for each horse. As with any normal horserace, the horse with the lowest odds has the best chance of winning but, of course, pays off the least.

During the betting sequence, each bettor is asked four questions:

1. Horse -- which horse do you wish to bet on; reply by typing the horse number (1-9) and a carriage return "↵".
2. Position -- which position your selected horse will finish; 1 for win, 2 for place, or 3 for show, followed by ↵ .
3. Bet -- how much do you want to bet; reply with a decimal number between 2.00 and 300.00, followed by ↵ .
4. More bets -- are there any more bettors after you; reply by typing YES or NO, followed by ↵ .

The race is sectioned into 8 partitions of calculation so that horse positioning can change during each of these partitions. These are "break from the gate", " $\frac{1}{4}$ mile", " $\frac{3}{8}$ mile", "midway", " $\frac{5}{8}$ mile", "rounding the turn", "coming down the stretch", and "finish".

At the completion of the race, the \$2 mutuals are printed plus the results for each bettor and the group results. The conclusion of the program lists the instructions on how to restart the race.

IV. LISTING

Below is a listing of the horserace program.

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W ALL
C-8K FOCAL @1969

01.01 T !!!"HORSE RACE"!!! "ANY NUMBER OF PLAYERS CAN BET ON THE RESULTS"
01.03 T !!!"DEC DERBY 1 MILE FOR 3 YEAR OLDS POST TIME 2:35"!
01.04 T !!! " THE HORSES FOR THE RACE TODAY ARE"!
01.05 D 2
01.10 F S=1,30;D 30
01.11 T !!!"ALL BETS ARE RECORDED, SUCKERS"!;S S=SS
01.12 T !!! " THEY'RE OFF AND RUNNING"!
01.13 F N=1,9;S H(N)=0
01.14 S M(1)=62.25;S M(2)=60;S M(3)=350/6;S M(4)=500/9
01.15 S M(5)=55;S M(6)=650/12;S M(7)=1100/21;S M(8)=1600/31
01.16 S O(1)=6;S O(2)=8;S O(3)=10;S O(4)=16
01.17 S O(5)=18;S O(6)=22;S O(7)=40;S O(8)=60
01.18 S K=0
01.19 C
01.20 F J=1,9;S H(J)=H(J)+2*(FRAN()- .5)*M(J)
01.21 S K=K+1;T !" ";I (8-K)1.3
01.22 D 22;D 10;S D=H(B(1));I (K-8)1.23,1.19,1.19
01.23 F I=1,9;D 23
01.24 G 1.19
01.30 T !!! " FINISH"!!!
01.31 T !!!"$2 MUTUALS PAID WERE THESE:"
01.32 T !" " WIN PLACE SHOW"
01.33 S K=0;F I=1,3;D 24
01.34 F I=1,3;D 16;D 17
01.35 T !!! " ";S Q=0;T !!!"READY FOR RESULTS OF BETTING"!
01.36 F J=1,S;T %2,!!"BET NO. ",J,"";D 18
01.37 I (Q)1.4,1.39
01.38 T !!!"AS A GROUP, YOUR WINNINGS ",%8.02,Q;G 1.5
01.39 T !!!"AS A GROUP, YOU'RE EVEN";G 1.5
01.40 T !!!"AS A GROUP, YOUR LOSSES ",%8.02,FABS(Q)
01.50 T !!!"TO RACE AGAIN, TYPE G"!;Q

02.05 T !!!"1=MAN O'WAR (3:1); 2=CITATION (4:1)"
02.10 T !!!"3=WHIRLAWAY (5:1); 4=ASSAULT (8:1)"
02.15 T !!!"5=SEABISCUIT (9:1); 6=GALLANT FOX (10:1)"
02.20 T !!!"7=STYMIE (20:1); 8=COALTOWN (30:1)"
02.25 T !!!"9=OLD PAINT (5,000,000:1) [SENTIMENTAL FAVORITE]"
02.30 T !!!"FOR EACH BET ENTER"
02.32 T !!!"HORSE(1-9)"
02.35 T !!!"TO WIN, PLACE, OR SHOW(1-3)"
02.40 T !!!"THE WAGER(2-300[DOLLARS])"
02.45 T !!!"AND YES FOR MORE BETTING OR NO IF ALL BETS ARE PLACED"
02.50 R
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10.01 S Q=1;F L1=1,8;S B(L1)=L1;S A(L1)=1
10.02 F L1=1,8;D 11
10.03 F L3=1,8;D 14
10.04 R

11.01 F L2=1,8;D 12
11.02 S A(L1)=A(L1)-1
11.03 R

12.01 I (L1-L2)12.02,12.05
12.02 I (H(L1)-H(L2))12.05,12.04,12.05
12.04 T !!"RERUN PLEASE";Q
12.05 I (H(L1)-H(L2))12.08
12.06 S A(L1)=A(L1)+1
12.08 R

14.01 S L1=9-L3;F L2=1,8;D 15
14.02 R

15.01 I (A(L2)-L1)15.05,15.02,15.05
15.02 S B(Q)=L2;S Q=Q+1;S L2=9
15.05 R

16.01 S A=R(I);T !
16.02 I (A-2)16.4,16.45;I (A-4)16.5,16.55;I (A-6)16.6,16.65
16.03 I (A-8)16.7,16.75
16.40 T "MAN O'WAR ";R
16.45 T "CITATION ";R
16.50 T "WHIRLAWAY ";R
16.55 T "ASSAULT ";R
16.60 T "SEABISCUIT ";R
16.65 T "GALLANT FOX ";R
16.70 T "STYMIE ";R
16.75 T "COALTOWN ";R

17.01 I (I-2)17.05,17.1,17.2
17.05 T ,%6.02,H(3),H(4),H(5);R
17.10 T " ,%6.02,H(6),H(7);R
17.20 T " ,%6.02,H(9);R

18.01 S P=0;F I1=1,3;D 20
18.02 I (I1-8)18.03,18.03,18.05
18.03 S I=T(J);T !" TEAR UP YOUR TICKET ON HORSE NO. ",%1,T(J);D 19
18.04 S Q=Q+P-V(J)
18.05 R

19.01 S A=T(J);T " ";D 16.02
19.02 R

20.01 S I=I1;I (B(I)-T(J))20.02,20.03
20.02 R
20.03 I (U(J)-I)20.1;S P=V(J)*H(2*I+U(J))
20.05 T %8.02,!" YOUR WINNINGS ",P," ON HORSE NO. ",%1,T(J);D 19
20.06 S Q=Q+P-V(J);S I1=10;R
20.10 T !" NEXT TIME BUY A SHOW TICKET ON HORSE NO. ",%1,T(J);D 19
20.11 G 20.06

22.01 I (K-2)22.5,22.55;I (K-4)22.6,22.65;I (K-6)22.7,22.75
 22.03 I (K-8)22.8;R
 22.50 T !" AS THEY BREAK FROM THE GATE -";R
 22.55 T !" AT THE 1/4 MILE POLE -";R
 22.60 T !" AT THE 3/8 MILE POLE -";R
 22.65 T !" MIDWAY IN THE RACE -";R
 22.70 T !" AT THE 5/8 MILE POLE -";R
 22.75 T !" ROUNDING THE TURN -";R
 22.80 T !" COMING DOWN THE STRETCH -";R

23.01 I (1-1)23.1;T !"POSITION HORSE LENGTHS BEHIND";G 23.15
 23.10 I (1-9)23.15;D 27;R
 23.15 S DM=.1*FITR(D-H(R(I)))
 23.20 I (R(I)-2)23.4,23.45;I (B(I)-4)23.5,23.55
 23.25 I (R(I)-6)23.6,23.65
 23.30 I (R(I)-8)23.7,23.75
 23.40 T %4,!I," MAN O'WAR ",%4.01,DM;R
 23.45 T %4,!I," CITATION ",%4.01,DM;R
 23.50 T %4,!I," WHIRLAWAY ",%4.01,DM;R
 23.55 T %4,!I," ASSAULT ",%4.01,DM;R
 23.60 T %4,!I," SEABISCUIT ",%4.01,DM;R
 23.65 T %4,!I," GALLANT FOX ",%4.01,DM;R
 23.70 T %4,!I," STYMIE ",%4.01,DM;R
 23.75 T %4,!I," COALTOWN ",%4.01,DM;R

24.01 D 25;S J=I;S SP=J
 24.02 F J=1,3;D 25
 24.03 R

25.01 S L=2*I+J;S R=3*(J-1);I (1-J)25.02;S R=1
 25.02 S H(L)=1.5+.01*FITR((O(B(I))/R+2*(FRAN()-.5))*100)
 25.03 R

27.01 I (K-2)27.2,27.25;I (K-4)27.3,27.35;I (K-6)27.4,27.45
 27.10 T !!"= 9 OLD PAINT* = ?"
 27.12 T !" *(WAS SHOT BY JOCKEY)!!";R
 27.20 T !!"= 9 OLD PAINT* = 40.5"
 27.22 T !" *(GOT SADDLE CAUGHT IN STARTING GATE)!!";R
 27.25 T !!"= 9 OLD PAINT* = 4562.8"
 27.27 T !" *(IS RUNNING THE WRONG WAY)!!";R
 27.30 T !!"= 9 OLD PAINT* = 5595.7 AND 3 FEET DOWN"
 27.32 T !" *(FELL IN A HOLE)!!";R
 27.35 T !!"= 9 OLD PAINT* = 20.5"
 27.37 T !" *(CUT ACROSS INFIELD)!!";R
 27.40 T !!"= 9 OLD PAINT* = 4800.1"
 27.42 T !" *(LOST A SHOE)!!";R
 27.45 T !!"= 9 OLD PAINT* = 48000.5"
 27.47 T !" *(BROKE LEFT REAR LEG)!!";R

30.01 T %2,!!"BET NO. ",S
 30.02 T !"HORSE?(1-9)";A T(S);I (9-T(S))30.02;I (T(S)-1)30.02
 30.03 I (T(S)-9)30.04;T !" GOOD LUCK,DO YOU BET MUCH?!"
 30.04 T "POSITION?(1,2,OR 3)";A U(S);I (3-U(S))30.04;I (U(S)-1)30.04
 30.06 T "BET?(2-300[IN DOLLARS])";A V(S)
 30.07 I (300-V(S))30.06;I (V(S)-2)30.06
 30.08 T "MORE BETS?(YES OR NO)";A Y1;I (Y1-0NO)30.1,30.11
 30.10 R
 30.11 S SS=S;S S=30;R

V. SAMPLE EXECUTION

At this point a listing of a sample execution was planned. However, this would greatly spoil your fun at initially seeing the printout. If you want to see an execution, you'll simply have to go to section II of this writeup and run the program yourself.

Good luck.

I. DESCRIPTION

The FOCAL program, written for an 8K system with no extended functions retained, is an attempt to simulate a horserace on a computer. Liberal use of the random number generator, together with the established odds on each horse, produces different results each time that the program is executed.

If you have had the privilege of using the DEC TSS/8 system in Maynard, you are doubtless familiar with the BASIC horserace (HOSSR*). The FOCAL horserace is identical to the BASIC horserace except that a 9th horse, Old Paint, has been added. While the antics of Old Paint are fixed, the initial execution of the program should produce at least a mild chuckle.

Incidentally, this author refuses to cover any bets placed on any race, except possibly for Old Paint.

