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 1: program MonteCarlo
 2: implicit real*8 (a-h,o-z)
 3: open(15, file="Monte_Carlo-DP.txt")
 4:          idum = -1
 5:         N = 10**7
 6:           PI = dACOS(-1.d0)
 7:           EXATO = exp(1.d0) - 1.d0
 8:         SUMF = 0.d0
 9:         SUMF2 = 0.d0
10:         DO 20 IX = 1, N
11:            FX = FUNC(ran3(idum))
12:            SUMF = SUMF + FX
13:            SUMF2 = SUMF2 + FX**2
14:         20 CONTINUE
15:         FAVE = SUMF/N
16:         F2AVE = SUMF2/N
17:         SIGMA = dSQRT((F2AVE - FAVE**2)/N)
18:         ERRO = dABS(FAVE - EXATO)
19:         ERRO2 = dABS(FAVE - EXATO)/EXATO * 100
20:         write(15,*) "Integral =", FAVE, "Exato =", EXATO
21:         write(15,*) "Erro estimado:", SIGMA,"Erro obtido:", ERRO,"Erro Percentual:",
    ERRO2
22:         write(15,*) "N =",N
23: end
24:
25: real*8 function FUNC(X)
26: implicit real*8 (a-h,o-z)
27:    FUNC = EXP(X)
28: return
29: end
30:
31: real*8 FUNCTION ran3(idum)
32: implicit real*8 (a-h,o-z)
33:       INTEGER idum
34:       INTEGER MBIG,MSEED,MZ
35:       PARAMETER (MBIG=1000000000,MSEED=161803398,MZ=0,FAC=1./MBIG)
36:       INTEGER i,iff,ii,inext,inextp,k
37:       INTEGER mj,mk,ma(55)
38:       SAVE iff,inext,inextp,ma
39:       DATA iff /0/
40:       if(idum.lt.0.or.iff.eq.0)then
41:         iff=1
42:         mj=abs(MSEED-abs(idum))
43:         mj=mod(mj,MBIG)
44:         ma(55)=mj
45:         mk=1
46:         do 11 i=1,54
47:           ii=mod(21*i,55)
48:           ma(ii)=mk
49:           mk=mj-mk
50:           if(mk.lt.MZ)mk=mk+MBIG
51:           mj=ma(ii)
52: 11      continue
53:         do 13 k=1,4
54:           do 12 i=1,55
55:             ma(i)=ma(i)-ma(1+mod(i+30,55))
56:             if(ma(i).lt.MZ)ma(i)=ma(i)+MBIG
57: 12        continue
58: 13      continue
59:         inext=0
60:         inextp=31
61:         idum=1
62:       endif
63:       inext=inext+1
64:       if(inext.eq.56)inext=1
65:       inextp=inextp+1
66:       if(inextp.eq.56)inextp=1
67:       mj=ma(inext)-ma(inextp)
68:       if(mj.lt.MZ)mj=mj+MBIG
69:       ma(inext)=mj
70:       ran3=mj*FAC
71:       return
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72:         END
73:
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