```fortran
1:  program MonteCarlo
2:  open(15, file="Monte_Carlo.txt")
3:          idum = -1
4:          N = 10**7
5:          PI = ACOS(-1.0)
6:          EXATO = PI/4.
7:        SUMF = 0.
8:        SUMF2 = 0.
9:        DO 20 IX = 1, N
10:         FX = FUNC(ran3(idum))
11:         SUMF = SUMF + FX
12:         SUMF2 = SUMF2 + FX**2
13:       20 CONTINUE
14:       FAVE = SUMF/N
15:       F2AVE = SUMF2/N
16:       SIGMA = SQRT((F2AVE - FAVE**2)/N)
17:           ERRO = ABS(FAVE - EXATO)
18:        write(15,*) "Integral =", FAVE, "Exato =", EXATO
19:        write(15,*) "Erro estimado:", SIGMA,"Erro obtido:", ERRO
20:        write(15,*) "N =",N
21:  end
22:
23:  function FUNC(X)
24:     FUNC = 1.d0/(1.d0 + X**2)
25:  return
26:  end
27:
28:  FUNCTION ran3(idum)
29:        INTEGER idum
30:        INTEGER MBIG,MSEED,MZ
31:        REAL ran3,FAC
32:        PARAMETER (MBIG=1000000000,MSEED=161803398,MZ=0,FAC=1./MBIG)
33:        INTEGER i,iff,ii,inext,inextp,k
34:        INTEGER mj,mk,ma(55)
35:        SAVE iff,inext,inextp,ma
36:        DATA iff /0/
37:        if(idum.lt.0.or.iff.eq.0)then
38:          iff=1
39:          mj=abs(MSEED-abs(idum))
40:          mj=mod(mj,MBIG)
41:          ma(55)=mj
42:          mk=1
43:          do 11 i=1,54
44:            ii=mod(21*i,55)
45:            ma(ii)=mk
46:            mk=mj-mk
47:            if(mk.lt.MZ)mk=mk+MBIG
48:            mj=ma(ii)
49: 11       continue
50:          do 13 k=1,4
51:            do 12 i=1,55
52:              ma(i)=ma(i)-ma(1+mod(i+30,55))
53:              if(ma(i).lt.MZ)ma(i)=ma(i)+MBIG
54: 12         continue
55: 13       continue
56:          inext=0
57:          inextp=31
58:          idum=1
59:        endif
60:        inext=inext+1
61:        if(inext.eq.56)inext=1
62:        inextp=inextp+1
63:        if(inextp.eq.56)inextp=1
64:        mj=ma(inext)-ma(inextp)
65:        if(mj.lt.MZ)mj=mj+MBIG
66:        ma(inext)=mj
67:        ran3=mj*FAC
68:        return
69:        END
70:
```