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1 1 CLS
2 2 Print
3 3 Print " _____ "
4 4 Print
5 6 Print " LOGARITHMIC BINOMIAL REDUNDANT RELIABILITY (LOGBIN.BAS) "
6 8 Print
7 12 Print " ORIGINAL DATE: Circa 1986"
8 14 Print " REVISION DATE: November 8, 2020"
9 16 Print " AUTHOR: Phil Rutherford (www.philrutherford.com) "
10 18 Print " RUN DATE: ";Date$;
11 19 Print " (DD-MM-YYYY)
12 20 Print " RUN TIME: ";TIME$
13 21 Print " RUN WITH MMBASIC.EXE (www.mmbasic.com) "
14 22 Print
15 24 Print " COMPUTES RELIABILITY OF OPERATING PARALLEL REDUNDANT UNITS"
16 26 Print " USING LOGARITHMIC BINOMIAL EXPANSION"
17 28 Print
18 30 Input " MINIMUM NUMBER OF OPERATING UNITS REQUIRED ";M
19 32 Input " MAXIMUM NUMBER OF OPERATING REDUNDANT UNITS AVAILABLE ";N
20 34 Input " UNIT FAILURE RATE (/HR) ";LAMDA
21 40 Input " MISSION TIME (HR) ";T
22 44 Print
23 45 INDEX = 1
24 47 Dim LFAC(M + N)
25 48 GOSUB 200
26 49 PINDEX = INDEX
27 50 RM = Exp(-M * LAMDA * T)
28 55 LRM = Log(RM)
29 60 Q = 1 - EXP(-LAMDA * T)
30 65 LQ = LOG(Q)
31 70 Print " RELIABILITY IS";RM;TAB(32);"Pr(=>";M;"/";M;".S) "
32 80 SUM = 0
33 90 For J = 0 To N
34 95 LTERM = (LFAC(J + M - 1) - LFAC(J + M - 1 - J) - LFAC(J)) + J * LQ
35 100 TERM = EXP(LTERM)
36 150 SUM = SUM + TERM
37 160 R = RM * SUM
38 165 IF J < PINDEX THEN GOTO 180
39 170 If J > 0 Then Print " RELIABILITY IS";R;TAB(32);"Pr(=>";M;"/";M + J;".S) "
40 176 PINDEX = J + INDEX
41 180 Next J
42 185 Print " _____ "
43 190 End
44 199 '-----
45 200 'SUBROUTINE FOR FACTORIALS
46 201 '-----
47 210 LFAC(1) = Log(1)
48 215 For I = 2 To M + N
49 220 LFAC(I) = LFAC(I - 1) + Log(I)
50 230 NEXT I
51 300 Return

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