Sensitivity analysis for EXAMPLE 5: a six-bay, twenty-one-bar truss (Lognormally distributed)

METHOD: PDD-MCS

--- Main Code ---

N = 21

X(I) ~ Lognormally distributed, \( \mu_1 \ldots \mu_4 = 120, \mu_5 = 50, \mu_6 = 40, \) COV = \( c \in [0.1, 0.7] \)

STIELTJES PROCEDURE

GAUSS QUADRATURE RULE BY STIELTJES PROCEDURE

--- Command line parameters to run the code ---

PROGRAM.EXE NVAR NBAS_R

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--- Code ---

NSAMP = 10**7

--- Main Code ---

IFLAG_AIJK = 0
N = 21
IMCS = 0
NVAR = 1
X0(1) = 2
X0(2) = 2
X0(3) = 2
X0(4) = 2
X0(5) = 2
X0(6) = 2
X0(7) = 10
X0(8) = 10
X0(9) = 10
X0(10) = 10
X0(11) = 10
X0(12) = 10
X0(13) = 3
X0(14) = 3
X0(15) = 3
X0(16) = 3
X0(17) = 3
X0(18) = 1
X0(19) = 1
X0(20) = 1
X0(21) = 1

--- Main Code ---

DO I = 1, N
XMU_IN(I) = X0(I)
        XSIG_IN(I) = 0.1 * XMU_IN(I)
XSIG_IN(i) = cov * XMU_IN(i)
ENDDO

NBAS = NBAS_R
NBAS_SM = NBAS_R
NGAUSS = 2*NBAS_R-1
NGAUSS_SM = 2
NGAUSS_GQ = 2

--- Main Code ---

dcov = 0.02
ncov = (0.7-0.1)/dcov
ncum = 5
ng_cum = 10
ng_cum_sen = 10
ntheta = 2
n_comp = 2

do i = 1, n_comp
        call PDD(XMU_IN, XSIG_IN, nvar, NBAS_R, i)
doi

call MCS_PDD2_sys (XMU_IN, XSIG_IN, nvar, NBAS_R,  NSAMP, n_comp, pf_sen_out_pdd, pf_sen_out_crude, pf_sen_out_crude_fd)

OPEN(200,FILE='PDD_MCS_cdf.DAT',STATUS='UNKNOWN')
WRITE(200,'(F20.10)'), pf_sen_out_pdd(1,1)
WRITE(200,'(<21>F20.10)'), pf_sen_out_pdd(2:22,1)
WRITE(200,'(<21>F20.10)'), pf_sen_out_pdd(2:22,2)

OPEN(201,FILE='crude_MCS_cdf.DAT',STATUS='UNKNOWN')
WRITE(201,'(F20.10)'), pf_sen_out_crude(1,1)
WRITE(201,'(<21>F20.10)'), pf_sen_out_crude(2:22,1)
WRITE(201,'(<21>F20.10)'), pf_sen_out_crude(2:22,2)

OPEN(202,FILE='crude_MCS_cdf_fd.DAT',STATUS='UNKNOWN')
WRITE(202,'(F20.10)'), pf_sen_out_crude_fd(1,1)
WRITE(202,'(<21>F20.10)'), pf_sen_out_crude_fd(2:22,1)
WRITE(202,'(<21>F20.10)'), pf_sen_out_crude_fd(2:22,2)

close(200)
close(201)
close(202)

END