

SUBROUTINE GALOG(M)

c Guassian points and weights for integration of $f(x)\ln(1/x)$ from 0 to 1

c (by Stroud & Secrest, 1966)

c this integral=sum of $f(XL(i))*WL(i)$ over $i=1,...,M$

c If the integration limits differ from 0 and 1, one has to done a transformation of int. variable before using GALOG

IMPLICIT REAL *8(A-H,O-Z)

c implicit double precision(A-H,O-Z)

COMMON/GAUSL/ XL(16),WL(16)

if(M.EQ.6) then

XL(1)=0.0216340058441169489956958558537D0

XL(2)=0.129583391154950796131158505009D0

XL(3)=0.314021449914765508798248188420D0

XL(4)=0.538657217351802144548941893993D0

XL(5)=0.756915337377402852164544156139D0

XL(6)=0.922668851372120237333873231507D0

WL(1)=0.238763662578547569722268303330D0

WL(2)=0.308286573273946792969383109211D0

WL(3)=0.245317426563210385984932540188D0

WL(4)=0.142008756566476685421345576030D0

WL(5)=0.0554546223248862900151353549662D0

WL(6)=0.0101689586929322758869351162755D0

end if

if(M.EQ.4) then

XL(1)=0.0414484801993832208033213101564D0

XL(2)=0.245274914320602251939675759523D0

XL(3)=0.556165453560275837180184354376D0

XL(4)=0.848982394532985174647849188085D0

WL(1)=0.383464068145135124850046522343D0

WL(2)=0.386875317774762627336008234554D0

WL(3)=0.190435126950142415361360014547D0

WL(4)=0.0392254871299598324525852285552D0

end if

if(M.EQ.2) then

XL(1)=0.112008806166976182957205488948D0

XL(2)=0.602276908118738102757080225338D0

WL(1)=0.718539319030384440665510200891D0

WL(2)=0.281460680969615559334489799109D0

end if

RETURN

END

C *****

SUBROUTINE GAUS(M)

c Guassian points and weights for integration of f(x) from -1 to 1

c (by Stroud & Secrest, 1966)

c this integral=sum of f(X(i))*W(i) over i=1,...,M

c If the integration limits differ from -1 and 1, one has to done a transformation of int. variable before using GAUS

IMPLICIT REAL *8(A-H,O-Z)

c implicit double precision(A-H,O-Z)

COMMON/GAUSS/ X(46),W(46)

IF(M.EQ.2) GO TO 4

IF(M.EQ.4) GO TO 1

IF(M.EQ.6) GO TO 2

IF(M.EQ.8) GO TO 10

IF(M.EQ.10) GO TO 12

IF(M.EQ.12) GO TO 3

if(M.EQ.40) go to 11

4 X(1)=-.577350269189625764509148780502D0

W(1)=1.D0

M=2

GO TO 100

1 X(1)=-.861136311594052575223946488893D0

X(2)=-.339981043584856264802665759103D0

W(1)=.347854845137453857373063949222D0

W(2)=.652145154862546142626936050778D0

M=4

GO TO 100

2 X(1)=-.932469514203152027812301554494D0

X(2)=-.661209386466264513661399595020D0

X(3)=-.238619186083196908630501721681D0

W(1)=.171324492379170345040296142173D0

W(2)=.360761573048138607569833513838D0

W(3)=.467913934572691047389870343990D0

M=6

GO TO 100

10 X(1)=-.960289856497536231683560868569D0

X(2)=-.796666477413626739591553936476D0

X(3)=-.525532409916328985817739049189D0

X(4)=-.183434642495649804939476142360D0

W(1)=.101228536290376259152531354310D0

W(2)=.222381034453374470544355994426D0

W(3)=.313706645877887287337962201987D0

W(4)=.362683783378361982965150449277D0

M=8

GO TO 100

12 X(1)=-.973906528517171720077964012084D0

X(2)=-.865063366688984510732096688423D0

X(3)=-.679409568299024406234327365115D0

X(4)=-.433395394129247190799265943166D0

X(5)=-.148874338981631210884826001130D0
W(1)=.0666713443086881375935688098933D0
W(2)=.149451349150580593145776339658D0
W(3)=.219086362515982043995534934228D0
W(4)=.269266719309996355091226921569D0
W(5)=.295524224714752870173892994651D0
M=10

go to 100

3 X(1)=-.981560634246719250690549090149D0
X(2)=-.904117256370474856678465866119D0
X(3)=-.769902674194304687036893833213D0
X(4)=-.587317954286617447296702418941D0
X(5)=-.367831498998180193752691536644D0
X(6)=-.125233408511468915472441369464D0
W(1)=.0471753363865118271946159614850D0
W(2)=.106939325995318430960254718194D0
W(3)=.160078328543346226334652529543D0
W(4)=.203167426723065921749064455810D0
W(5)=.233492536538354808760849898925D0
W(6)=.249147045813402785000562436043D0
M=12

go to 100

11 x(1)=-.998237709710559200349622702421D0
x(2)=-.990726238699457006453054352221D0
x(3)=-.977259949983774262663370283713D0
x(4)=-.957916819213791655804540999453D0
x(5)=-.932812808278676533360852166845D0
x(6)=-.902098806968874296728253330868D0
x(7)=-.865959503212259503820781808355D0
x(8)=-.824612230833311663196320230666D0
x(9)=-.778305651426519387694971545506D0
x(10)=-.727318255189927103280996451755D0
x(11)=-.671956684614179548379354514961D0
x(12)=-.612553889667980237952612450231D0
x(13)=-.549467125095128202075931305530D0
x(14)=-.483075801686178712908566574245D0
x(15)=-.413779204371605001524879745804D0
x(16)=-.341994090825758473007492481179D0
x(17)=-.268152185007253681141184344809D0
x(18)=-.192697580701371099715516852065D0
x(19)=-.116084070675255208483451284408D0
x(20)=-.0387724175060508219331934440246D0
w(1)=.452127709853319125847173287819D-02
w(2)=.104982845311528136147421710673D-01
w(3)=.164210583819078887128634848824D-01
w(4)=.222458491941669572615043241842D-01
w(5)=.279370069800234010984891575077D-01
w(6)=.334601952825478473926781830864D-01

w(7)=.387821679744720176399720312904D-01
w(8)=.438709081856732719916746860417D-01
w(9)=.486958076350722320614341604481D-01
w(10)=.532278469839368243549964797723D-01
w(11)=.574397690993915513666177309104D-01
w(12)=.613062424929289391665379964084D-01
w(13)=.648040134566010380745545295668D-01
w(14)=.679120458152339038256901082319D-01
w(15)=.706116473912867796954836308553D-01
w(16)=.728865823958040590605106834425D-01
w(17)=.747231690579682642001893362613D-01
w(18)=.761103619006262423715580759225D-01
w(19)=.770398181642479655883075342838D-01
w(20)=.775059479784248112637239629583D-01
M=40

100 MH=M/2

DO 200 J=1,MH

N=MH+J

c X(N)=-X(J)

c 200 W(N)=W(J)

X(N)=-X(MH-J+1)

200 W(N)=W(MH-J+1)

RETURN

END