Program STEHFEST

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DEFDBL A-Z
DIM x(20), yo(20), pp(20), p(20), xk(20), hvd(500), g(20)
DIM dl(20), td(500), w(55), cd(400), ff(20), hvd0(400), hvd5(400)
DIM hvd20(400), hvd30(400), hvd10(400), hy(20), rl(20)
DIM cd1(400), sw0(20), sw3(20), sw5(20), sw10(20), sw15(20), sw20(20)
DIM sc1(100), sc2(100), sc3(100), sc4(100), sosa(100), nad(100)
CLS : pocbodu = 60: cd(1) = 100: cd(2) = 500: cd(3) = 1000
N = 12: k = n/2: w(1) = 0: w(2) = 5: w(3) = 10: w(4) = 30
G(1) = 1
FOR I = 2 TO 18: g(i) = g(i-1) * i: NEXT i
td(1) = 100!: l = 2
FOR j = 2 TO 7
  FOR I  = 1 TO 10
    td(l) = 10^j * 10^(.1 * i)
    1 = l + 1
  NEXT i
NEXT j
FOR ll = 1 TO 1
  FOR kk = 1 TO 4
    FOR ii = 1 TO 60
      b1 = LOG(2) / (td(ii)): A1 = B1
      FOR I = 1 TO n
        ccc = i: x(i) = SQR(A1 * ccc): X1 = x(i)
        IF x1 < 4 THEN 101
        tl = 4 / x1: t2 = t1 * t1
        po = ((((-.0000037043# * t2 + .0000173565#) * t2 - .0000487613#
        qo = ((((.0000032312# *t - .0000142078#) * t2 + .0000342468#
        p1 = ((((.0000042414# * t2 - .000020092#) * t2 + .0000580759#)
        q1 = ((((-.0000036594# * t2 + .00001622#) * t2 - .0000398708#)
        a = 2 / SQR(x1) : b = a * t1: cc = x1 - .7853982
        yy = a * po * SIN(cc) + b * qo * COS(cc)
        yyy = -a * pl * COS(cc) + b * q1 * SIN(cc)
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      yo(i) = yy: y1(i) = yyy
      GOTO 1
   01   REM
      xx = x1 / 2: x2 = xx * xx: ttt = LOG(xx) + .5772157
      sum = 0!: term = ttt: yy = ttt
      FOR l = 1 TO 15
        IF (l – 1) < 0 THEN 250
        IF (l – 1) = 0 THEN 260
        IF (l – 1) > 0 THEN 250
50      REM
      sum = sum + 1! / (l – 1)
60      REM
      fl = l: ts = ttt – sum
      term = (term * (-x2) / flˆ2) * (1 – 1 / (fl * ts))
70      REM
      yy = yy + term
    NEXT 1      '..... pro 1
    term = xx * (ttt - .5): sum = 0!: yyy = term
    FOR 1 = 2 TO 16
      sum = sum + 1 / (1 – 1): fl = 1
      fl1 = fl – 1: ts = ttt – sum
      term = (term * (-x2) / (fll * fl)) * ((ts - .5 / fl) / (ts +
      yyy = yyy + term
    NEXT 1     '.......pro l
    pi2 = .6366198: yy = pi2 * yy: yyy = -pi2 / x1 + pi2 * yyy
    yo(i) = yy: y1(i) = yyy
03    REM
    pp(i) = yo(i) + w(kk) * x(i) * y1(i)
    p(i) = pp(i) / (x(i)ˆ2 * (x(i) * y1(i) + cd(ll) * x(i)ˆ2 *
  NEXT i
  con1 = kˆ(k – 1): xk(1) = con1 / g(k – 1)
  FOR j = 2 TO (k – 1)
    con1 = (-1)ˆ(j – 1) * j * (k + 1 – j)ˆ(k – 1)
    xk(j) = con1 / (g(j) * g(k – j))
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    NEXT j
    con2 = (-1)^(k – 1) * k: xk(k) = con2 / g(k)
    dl(1) = a1 * g(2): ru = p(1): rl(1) = (-1) * p(2)
    ru = ru + rl(1): ff(1) = dl(1) * ru
    FOR j = 2 TO k
      dl(j) = a1 * g(2 * j) / (g(j) * g(j – 1)): rl(1) = p(j)
    FOR i = 1 TO 9j – 1)
      zn = (-1)^i: jj1 = j + i: jj2 = j – i
      rl(i + 1) = zn * g(j) * p(jj1) / (g(i) * g(jj2))
    NEXT i
    zn = (-1)^j: rl(j + 1) = zn * p(2 * j): srl = rl(1)
    FOR i = 2 TO j + 1
      srl = srl + rl(i)
    NEXT i
    ff(j) = srl * dl (j)
00   REM
    NEXT j
    svdp = xk(1) * ff(k)
    FOR i = 2 TO k
      svdp = svdp + xk(i) * ff(k + 1 – i)
    NEXT i
    IF kk = 1 THEN
      dvd0(ii) = svdp
    ELSEIF kk = 2 THEN
      hvd5(ii) = svdp
    ELSEIF kk = 3 THEN
      hvd10(ii) = svdp
    ELSE
      hvd30(ii) = svdp
    END IF
  NEXT ii
 NEXT kk
NEXT 11
OPEN "B:\DATA\hvd.dat" FOR OUTPUT AS #1
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FOR i = 1 TO pocbodu
  PRINT #1, hvd0(i), hvd5(i), hvd10(i), hvd30(i)
NEXT: CLOSE #1

CLS : LOCATE 10, 30: INPUT " Number of points"; pocbodu
SCREEN 12: COLOR 3: WINDOW (0, 0)-(300, 300)
LOCATE 1, 2: PRINT "10E+2": GET (2, 285)-(25, 300), c1
LOCATE 1, 2: PRINT "10E+3": GET (2, 285)-(25, 300), c2
LOCATE 1, 2: PRINT "10E+4": GET (2, 285)-(25, 300), c3
LOCATE 1, 2: PRINT "10E+5": GET (2, 285)-(25, 300), c4
LOCATE 1, 2: PRINT "10E+6": GET (2, 285)-(25, 300), c5
LOCATE 1, 2: PRINT "(td) ": GET (2, 285)-(25, 300), vosa: CLS
LOCATE 1, 2: PRINT "0.0": GET (2, 285)-(25, 300), sc1
LOCATE 1, 2: PRINT "10.0": GET (2, 285)-(25, 300), sc2
LOCATE 1, 2: PRINT "20.0": GET (2, 285)-(25, 300), sc3
LOCATE 1, 2: PRINT "30.0": GET (2, 285)-(25, 300), sc4
LOCATE 1, 2: PRINT "(sd)": GET (2, 285)-(25, 300), sosa
LOCATE 1, 2: PRINT "Fig.1" : GET (2, 285)-(25, 300), nad
CLS
obrx = 600: obry = 400: pruhl = 50: pruhp = 50: pruhd = 75: pruhh = 25
vpx = 4: vpy = 3
umpopx = 20: umpopy = 15: predsv = 15: pozvdpop = 40: poposx = 500
poposy = 320: pozsvpop = 10: predss = 15: skrozx = 5: skrozy = 40
rozsahx = (obrx – pruhl – pruhp): prepocetx = rozsahx / skrozx
rozsahy = (obry – pruhd – pruhh)” prepocety = rozsahy / skrozy
COLOR 3: WINDOW (0, 0)-(obrx, obry)
LINE (pruhl, pruhd)-(obrx – pruhp, pruhd)
LINE –(obrx – pruhp, obry – pruhh)
LINE –(pruhl, obry – pruhh): LINE –(pruhl, pruhd)
COLOR 1
FOR i = 1 TO 4
  LINE (pruhl + i * prepocetx, pruhd)-(pruhl + i * prepocetx, obry – pr
NEXT
FOR i = 10 TO 30 STEP 10
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  LINE (pruhl, pruhd + i * prepocety)-(obrx – pruhp, pruhd + i * prepoc
NEXT
COLOR 7
PUT (pruhl – predsv, pozvdpop), c1
PUT (pruhl + 1 * prepocetx – predsv, pozvdpop), c2
PUT (pruhl + 2 * prepocetx – predsv, pozvdpop), c3
PUT (pruhl + 3 * prepocetx – predsv, pozvdpop), c4
PUT (pruhl + 4 * prepocetx – predsv, pozvdpop), c5
PUT (pruhl + 5 * prepocetx – predsv, pozvdpop), vosa
PUT (pozsvpop + 5, pruhd – predss), sc1
PUT (pozsvpop, pruhd + 10 * prepocety – predss), sc2
PUT (pozsvpop, pruhd + 20 * prepocety – predss), sc3
PUT (pozsvpop, pruhd + 30 * prepocety – predss), sc4
PUT (pozsvpop, pruhd + 40 * prepocety – predss), sosa
PUT (umpopx, umpopy), nad
py = prepocety: pd = pruhd
FOR i = 1 TO pocbodu
  hodx = (cd(i) – 2) * prepocetx + pruhl
  hy(1) = hvd0(i) * py + pd: hy(2) = hvd5(i) * py + pd
  hy(3) = hvd10(i) * py + pd: hy(4) = hvd30(i) * py + pd
  FOR j = 3 TO 4
    LINE (hodx – vpx, hy(j))-(hodx + vpx, hy(j))
    LINE (hodx, hy(j) – vpy)-(hodx, hy(j) + vpy)
  NEXT
NEXT
SLEEP
END
DEFDBL A-Z
DIM sw(20), cd1(20), cd(20)
COLOR 3: CLS
FOR i = 1 TO 9: READ cd1(i): NEXT
  LOCATE 10, 30: INPUT " Number of points = ", pocbodu
  CLS : LOCATE 10, 30: INPUT " SKIN FACTOR = ", W: CLS
  FOR i = 1 TO pocbodu: cd(i) = (LOG(cd1(i))) / (LOG(10)): NEXT
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  FOR i = 1 TO pocbodu
    LOCATE 10, 30: PRINT USING " i = ##"; i: LOCATE 12, 30
    LOCATE 12, 30: INPUT " sklon = ", sw(i): CLS
  NEXT
  xi = cd(1): yi = sw(1): xi2 = cd(1)ˆ2: xiyi = cd(1) * sw(1)
  FOR i = 2 TO pocbodu
    xi = xi + cd(i): yi = yi + sw(i): xi2 = xi2 + (cd(i))ˆ2
    xiyi = xiyi + cd(i) * sw(i)
  NEXT
  ca = (xi2 * yi – xi * xiyi) / (pocbodu * xi2 – xiˆ2)
  cb = (pocbodu * xiyi – xi - * yi) / (pocbodu * xi2 – xiˆ2)
  COLOR 4: LOCATE 10,5
  PRINT USING "   W = ##   a = ##.###   b = ##.###"; w;
  DATA 100,500,1000,5000,10000,50000,100000,500000,1000000
  END
DEFDBL A-Z
DIM x(20), xy(20), b(20), g(15), p(10, 10), w(15), vc1(100), vc2(100)
DIM vc3(100), vc4(100), sc1(100), sc2(100), sc3(100), sc4(100), sc5(100)
DIM sc6(100), popis(500), vc5(100), vw(100)
SCREEN 12: COLOR 3: Window (0, 0)-(300, 300)
LOCATE 1, 2: PRINT " 0 ": GET (2, 285)-(25, 300), vc1
LOCATE 1, 2: PRINT " 10 ": GET (2, 285)-(25, 300), vc2
LOCATE 1, 2: PRINT " 20 ": GET (2, 285)-(25, 300), vc3
LOCATE 1, 2: PRINT " 30 ": GET (2, 285)-(25, 300), vc4
LOCATE 1, 2: PRINT "(W) ": GET (2, 285)-(25, 300), vc5
LOCATE 1, 2: PRINT "0.98": GET (2, 285)-(25, 300), sc1
LOCATE 1, 2: PRINT "1.00": GET (2, 285)-(25, 300), sc2
LOCATE 1, 2: PRINT "1.02": GET (2, 285)-(25, 300), sc3
LOCATE 1, 2: PRINT "(b) ": GET (2, 285)-(25, 300), sc4
LOCATE 1, 2: PRINT " Fig. 6 ": GET (2, 285)-(25, 300), popis
CLS : pochod = 7: w(1) = 0: w(2) = 3: w(3) = 5: w(4) = 10: w(5) = 15
 (6) = 20: w(7) = 30
FOR i = 1 TO pochod
  LOCATE 10, 15: PRINT USING " I = ## "; i: LOCATE 10, 25
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  INPUT " Value of b(i) .. "; b(i): CLS
NEXT
LOCATE 10, 30: INPUT " Degree of pol. ( 2 – 4 ) "; stpol
FOR i = 1 TO 8: x(i) = w(1)^i: NEXT
FOR i = 1 TO 5: xy(i) = (w(1)^(i – 1)) * b(1): NEXT
FOR j = 1 TO 8
  FOR i = 2 TO pochod
    x(j) = x(j) + w(i)^j
  NEXT
NEXT
FOR j = 1 TO 5
  FOR i = 2 TO pochod
    xy(j) = xy(j) + b(i) * w(i)^(j – 1)
  NEXT
NEXT
FOR i = 1 TO 5: g(i) = xy(i): NEXT: p(1, 1) = pochod
FOR i = 2 TO 5: p(1, i) = x(i – 1): NEXT
FOR i = 1 TO 5
  p(2, i) = x(i): p(3, i) = x(i + 1): p(4, i) = x(i + 2)
p(5, i) = x(i + 3): NEXT: n = stpol
GAUSS elimination
FOR i = 1 TO n: PRINT i
  a = 1 / p(i, i): g(i) = a * g(i)
  FOR j = i TO n: p(i, j) = a * p(i, j): NEXT j: IF i = n THEN 100
  FOR j = i + 1 TO n: g(j) = g(j) – p(j, i) * g(i)
  FOR k = i + 1 TO n: p(j, k) = p(j, k) – p(j, i) * p(i, k)
  NEXT k: NEXT j: NEXT i
00 ' Back substitution

f(n) = g(n)
FOR i = 1 TO n – 1: j = n – i: PRINT j; : f(j) = g(j)
FOR k = j + 1 TO n: f(j) = f(j) – p(j, k) * f(k): NEXT k: NEXT i
CLS : PRINT " SOLUTION ": PRINT
FOR i = TO n + 1: PRINT "I = "; i; "-F = "; f(i): NEXT i
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SCREEN 12: COLOR 7: obrx = 600: obry = 400: pruhl 50
pruhp = 50: pruhd = 75: pruhh = 25: vpx = 6: vpy = 4: umpopx = 20
umpopy = 15: predsv = 17: pozvdpop = 45: poposx = 500
poposy = 320: pozsvpop = 5: predss = 15: skrozx = 5: skrozy = 40
WINDOW (0, 0)-(obrx, obry): CLS
LINE (pruhl, pruhd)-(obrx – pruhp, pruhd): LINE –(obrx – pruhp, obry –p
LINE –(pruhl, obry – pruhh): LINE –(pruhl, pruhd)
rozsahx = (obrx – pruhl – pruhp): skrozx = 40: prepocetx = rozsahx / skr
rozsahy = (obry – pruhd – pruhh): skrozy = .06: prepocety = rozsahy / sk
FOR i = 10 TO 30 STEP 10
  LINE (pruhl + i * prepocetx, pruhd)-(pruhl + i * prepocetx, obry – pru
NEXT
FOR i = .02 TO .06 STEP .02
  LINE (pruhl, i * prepocety + pruhd)-(obrx – pruhp, i * prepocety + pru
NEXT
PUT (pruhl + 0 * prepocetx – predsv, pozvdpop), vc1
PUT (pruhl + 10 * prepocetx – predsv, pozvdpop), vc2
PUT (pruhl + 20 * prepocetx – predsv, pozvdpop), vc3
PUT (pruhl + 30 * prepocetx – predsv, pozvdpop), vc4
PUT (pruhl + 40 * prepocetx – predsv, pozvdpop), vc5
PUT (umpopx, umpopy), popis
PUT (pozsvpop, 0! * prepocety + pruhd – predss), sc1
PUT (pozsvpop, .02 * prepocety + pruhd – predss), sc2
PUT (pozsvpop, .04 * prepocety + pruhd – predss), sc3
PUT (pozsvpop, .06 * prepocety + pruhd – predss), sc4
FOR i = 1 TO 7: COLOR 6
hodx = prepocetx * w(i) + pruhl: hody = prepocety * (b(i) - .98) + pruhd
LINE (hodx – vpx, hody)-(hodx + vpx, hody)
LINE (hodx, hody – vpy)-(hodx, hody + vpy): NEXT
j = 1: COLOR 3
IF stpol = 3 THEN
  hodx1 = .2 * prepocetx + pruhl
  hody1 = ((f(1) + f(2) * .4 + f(3) * .4ˆ2) - .98) prepocety + pruhd
  hodx2 = .4 * prepocetx + pruhl
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  hody2 = ((f(1) + f(2) * .4 + f(3) * .4ˆ2) - .98) prepocety + pruhd
  LINE (hodx1, hody1)-(hodx2, hody2)
  FOR vw = .8 TO 30! STEP .4
    hodx = vw * prepocetx + pruhl
    hody = ((f(1) + f(2) * vw + f(3) * vwˆ2) - .98) prepocety + pruh
    LINE –(hodx, hody): NEXT
ELSE
hodx1 = .2 * prepocetx + pruhl
hody1 = ((f(1) + f(2) * .4 + f(3) * .4ˆ2) - .98) prepocety + pruhd
hodx2 = .4 * prepocetx + pruhl
hody2 = ((f(1) + f(2) * .4 + f(3) * .4ˆ2) - .98) prepocety + pruhd
LINE (hodx1, hody1)-(hodx2, hody2)
FOR vw = .8 TO 30! STEP .4
hodx = vw * prepocetx + pruhl
hody = ((f(1) + f(2) * vw + f(3) * vwˆ2 + f(4) * vwˆ3) - .98) * prep
LINE –(hodx, hody): NEXT
END IF
END
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