Opt_bri

```
Rem Opt_bri_260221_1620.bas
Rem Peter Lohmander

Open "A_Opt_bri_Out.txt" For Output As #2
Screen _NewImage(400, 500, 256)

For P_Depth = 50 To 150 Step 10

   OptObj = -999999

   For Depth = 40 To 80 Step 5
      For FWA = 0 To 10
         For FWP = 0 To 10

            GoSub Parameters

            alpha = alpha_a * (50 / Depth) * (1 - .3 * FWP ^ .5)
            beta = beta_a * (Depth / 50) * (1 + .3 * FWA ^ .5)

            Lam = (alpha * beta) ^ .5
            bda = beta ^ .5 / alpha ^ .5

            For x0 = 1000 To 6000 Step 500
               A1 = ((x0 - v / beta) * bda - y0 + u / alpha) / (2 * bda)
               A2 = (y0 - u / alpha + bda * (x0 - v / beta)) / (2 * bda)

               GoSub Results

               If OptObj > Objective Then GoTo 100
               OptObj = Objective
               OptDepth = Depth
               Optx0 = x0
               OptFWA = FWA
               OptFWP = FWP
               Optalpha = alpha
               Optbeta = beta
               OptT = T
               OptxT = xT
               OptyT = yT
               100 Rem

            Next x0
         Next FWP
      Next FWA
   Next Depth

   Print #2, ""
   Print #2, ""
   Print #2, "P_Depth = "; P_Depth
   Print #2, ""

   Print #2, "   OptObj   = "; OptObj
   Print #2, "   Optx0    = "; Optx0
   Print #2, "   OptDepth = "; OptDepth
```

```
    Print #2, "   OptFWA   = "; OptFWA
    Print #2, "   OptFWP   = "; OptFWP
    Print #2, "   Optalpha = "; Optalpha
    Print #2, "   Optbeta  = "; Optbeta
    Print #2, "   OptT     = "; OptT
    Print #2, "   OptxT    = "; OptxT
    Print #2, "   OptyY    = "; OptyT

Next P_Depth

Close #2
End


Parameters:
alpha_a = 0.02
beta_a = 0.02
u = 50
v = 100
y0 = 3000
r = 0.01
Return


Results:
GoSub FinalT
T = TimeEnd
GoSub Xforce
xT = Xf
GoSub Yforce
yT = yF
Objective = -P_Depth * Depth - 1 * x0 - .0002 * x0 * x0 - 1 * u * T - 170 * FWP - 170 * FWA + Exp(-r * T) * (xT -
yT) - 10000 * ywins
Return


Xforce:
Xf = A1 * Exp(Lam * T) + A2 * Exp(-Lam * T) + v / beta
Return


Yforce:
yF = -bda * A1 * Exp(Lam * T) + bda * A2 * Exp(-Lam * T) + u / alpha
Return


FinalT:
TimeEnd = 1000
xwins = 0
ywins = 0
For T = 0 To 1000 Step 0.1
    GoSub Xforce
    GoSub Yforce
    If Xf < 0 Then TimeEnd = T
    If Xf < 0 Then ywins = 1
    If ywins = 1 Then Return
```

```
    If yF < 0 Then TimeEnd = T
    If yF < 0 Then xwins = 1
    If xwins = 1 Then Return
Next T
Return
```

Results from different versions of the software:

Table A11.
Results from optimization code "A_Opt_bri_260221_1620".

P_Depth	Opt_Obj	Opt_x0	Opt_Depth	Opt_FWA	Opt_FWP	Opt_Alpha	Opt_Beta	Opt_T	Opt_xT	Opt_yT
50	-8366	2500	80	5	1	0.00875	0.05347	43.7	4002	0
60	-9166	2500	80	5	1	0.00875	0.05347	43.7	4002	0
70	-9937	2500	75	5	2	0.007676	0.05012	47.3	4200	0
80	-10664	2500	70	6	3	0.006863	0.04858	48.8	4320	0
90	-11338	2500	65	6	4	0.006154	0.04511	54	4565	0
100	-11934	2500	60	7	5	0.005486	0.04305	57.1	4743	0
110	-12508	2500	50	7	10	0.001023	0.03587	65.9	5652	0
120	-13008	2500	50	7	10	0.001023	0.03587	65.9	5652	0
130	-13475	2500	45	8	10	0.00114	0.03327	73.8	6004	0
140	-13925	2500	45	8	10	0.00114	0.03327	73.8	6004	0
150	-14375	2500	45	8	10	0.00114	0.03327	73.8	6004	0

Table A12.
Results from optimization code "A_Opt_bri_260221_1648". This code is identical to the code "A_Opt_bri_260221_1620", with the following exception: There is a loop with different values of P_x0, and the parameter P_Depth is held constant at the value 100.

P_x0	Opt_Obj	Opt_x0	Opt_Depth	Opt_FWA	Opt_FWP	Opt_Alpha	Opt_Beta	Opt_T	Opt_xT	Opt_yT
0.5	-10443	3500	60	6	2	0.009596	0.04164	42.2	4919	0
0.6	-10793	3500	60	6	2	0.009596	0.04164	42.2	4919	0
0.7	-11101	3000	60	7	3	0.008006	0.04305	48.4	4726	0
0.8	-11402	3000	60	7	3	0.008006	0.04305	48.4	4726	0
0.9	-11702	3000	60	7	3	0.008006	0.04305	48.4	4726	0
1	-11964	2500	60	7	5	0.005486	0.04305	57.1	4743	0
1.1	-12177	2000	55	6	10	0.000933	0.03817	72.2	5456	0
1.2	-12377	2000	55	6	10	0.000933	0.03817	72.2	5456	0
1.3	-12554	1500	55	7	10	0.000933	0.03946	82.9	5446	0
1.4	-12704	1500	55	7	10	0.000933	0.03946	82.9	5446	0
1.5	-12854	1500	55	7	10	0.000933	0.03946	82.9	5446	0