MA374-LAB10
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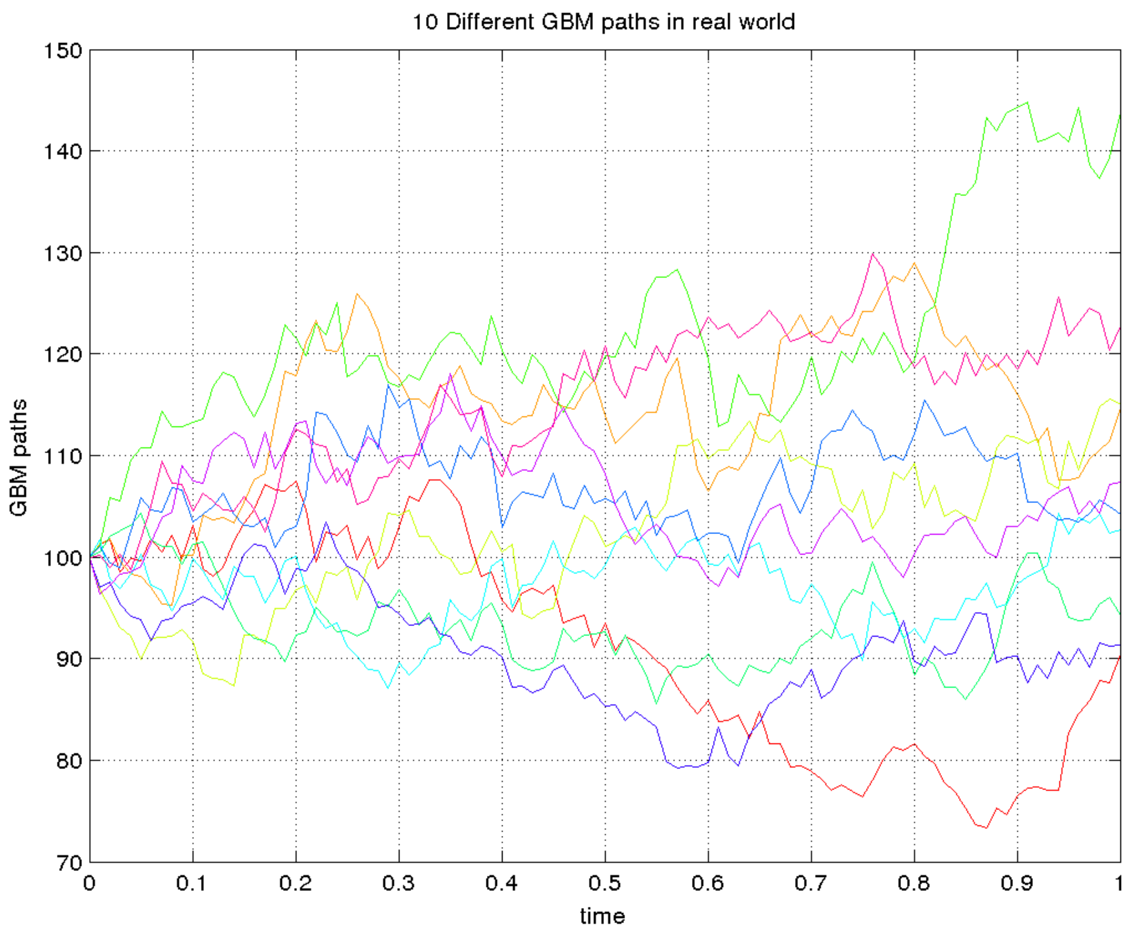
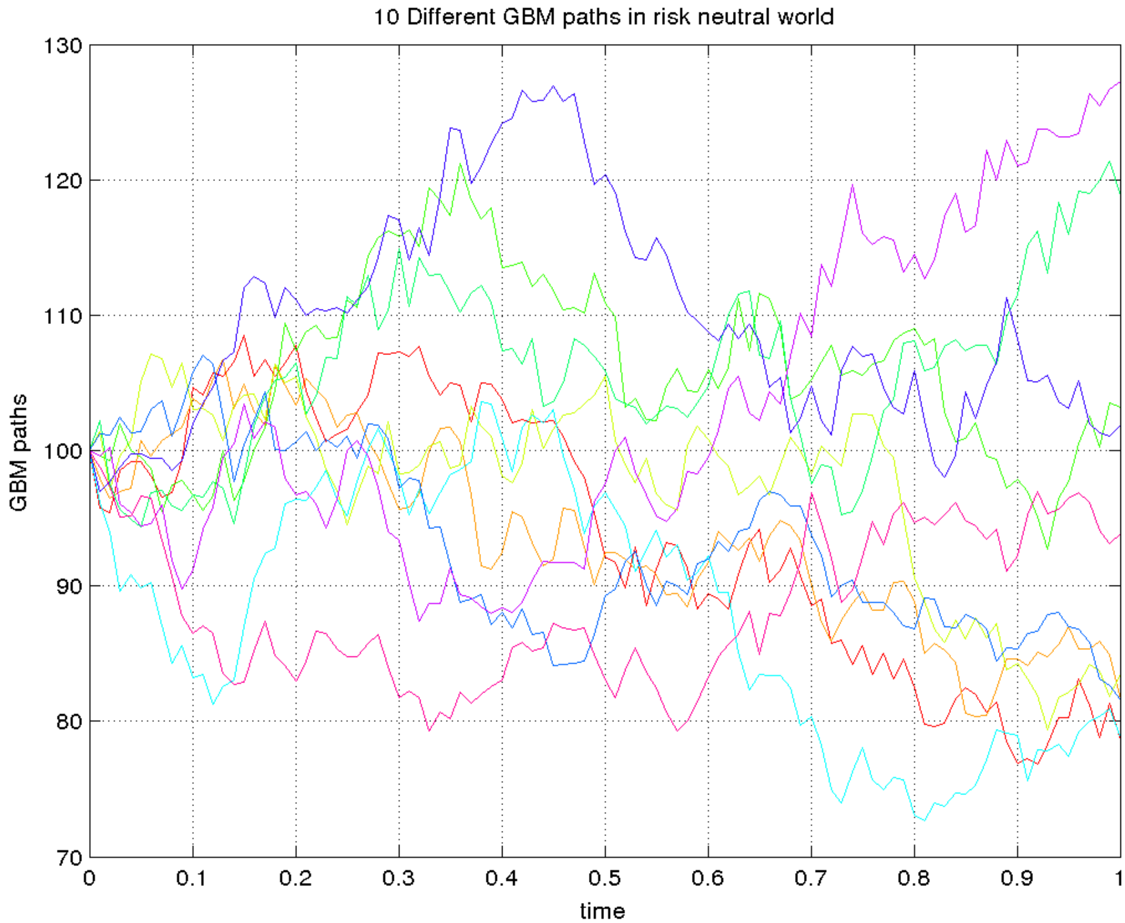
Roll:11012323

1. **GBM in real world:**



GBM in risk-neutral world:



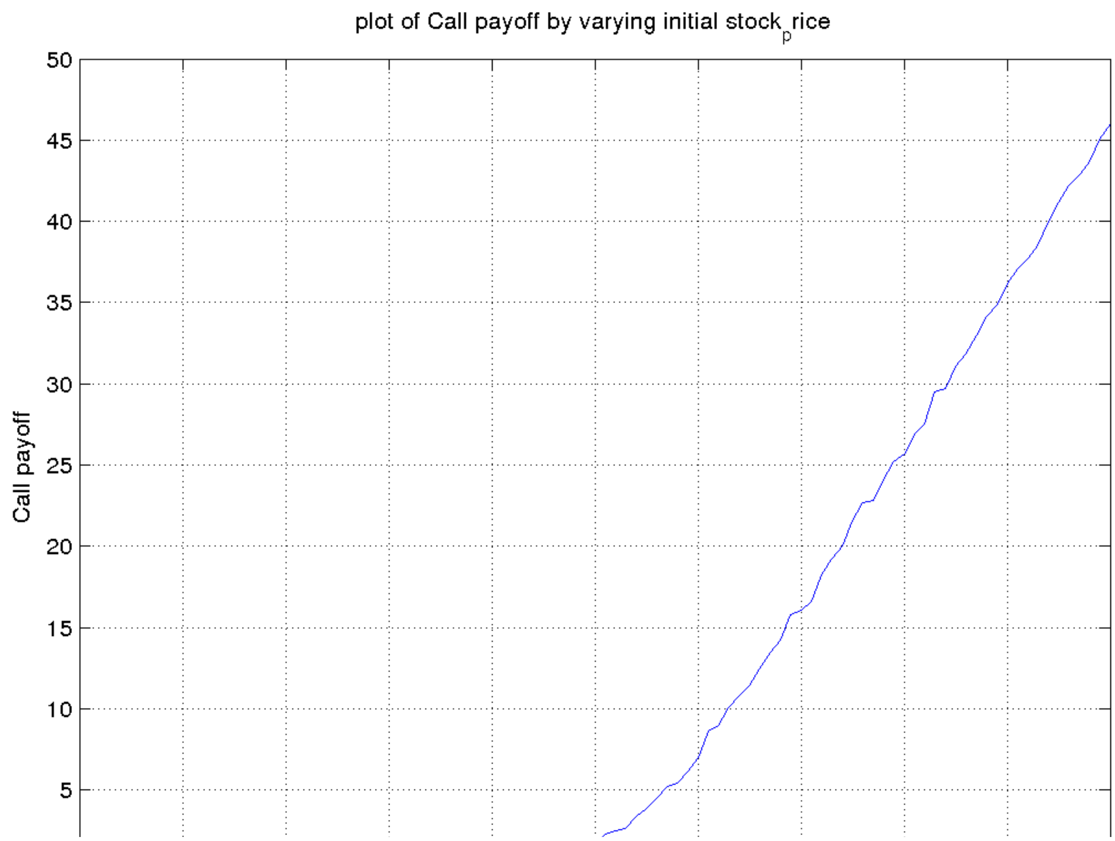
2.

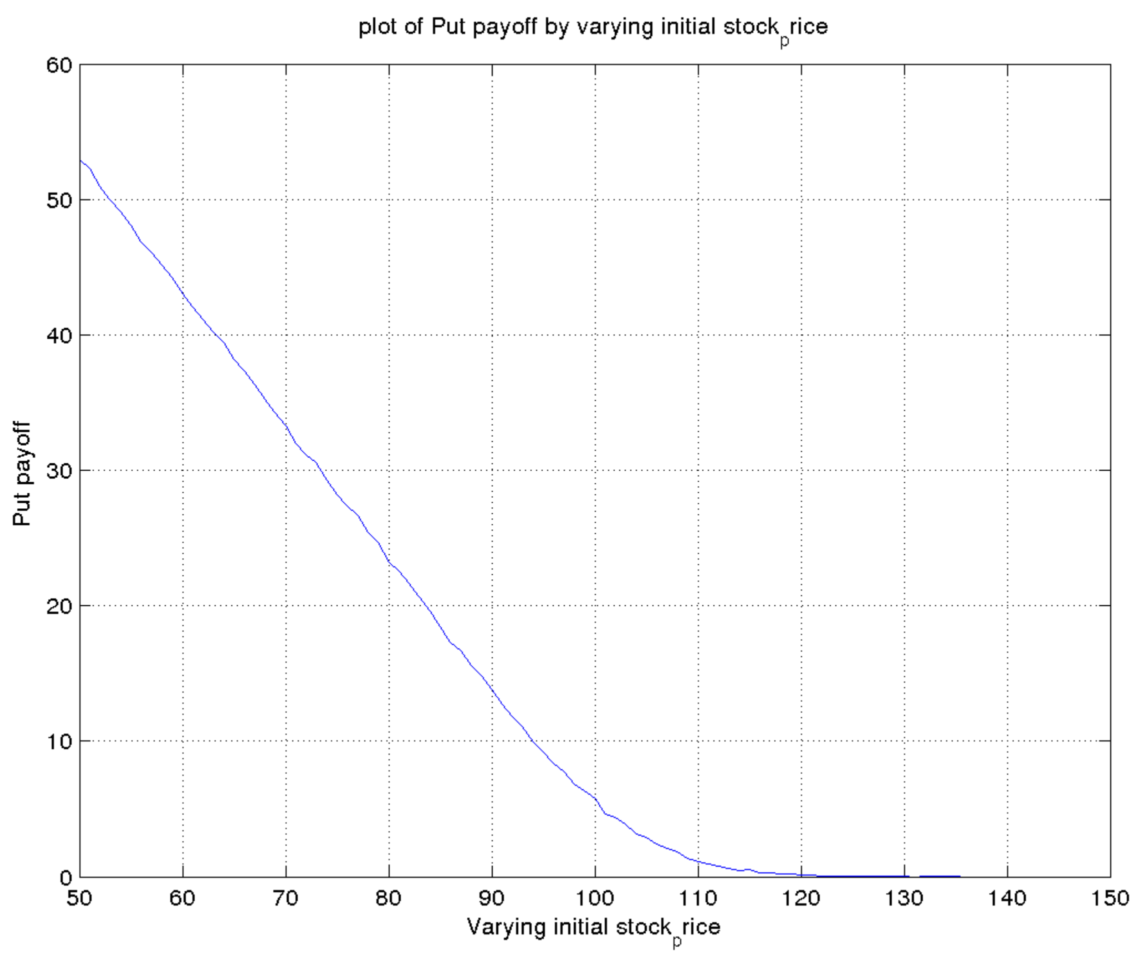
With 95% confidence interval

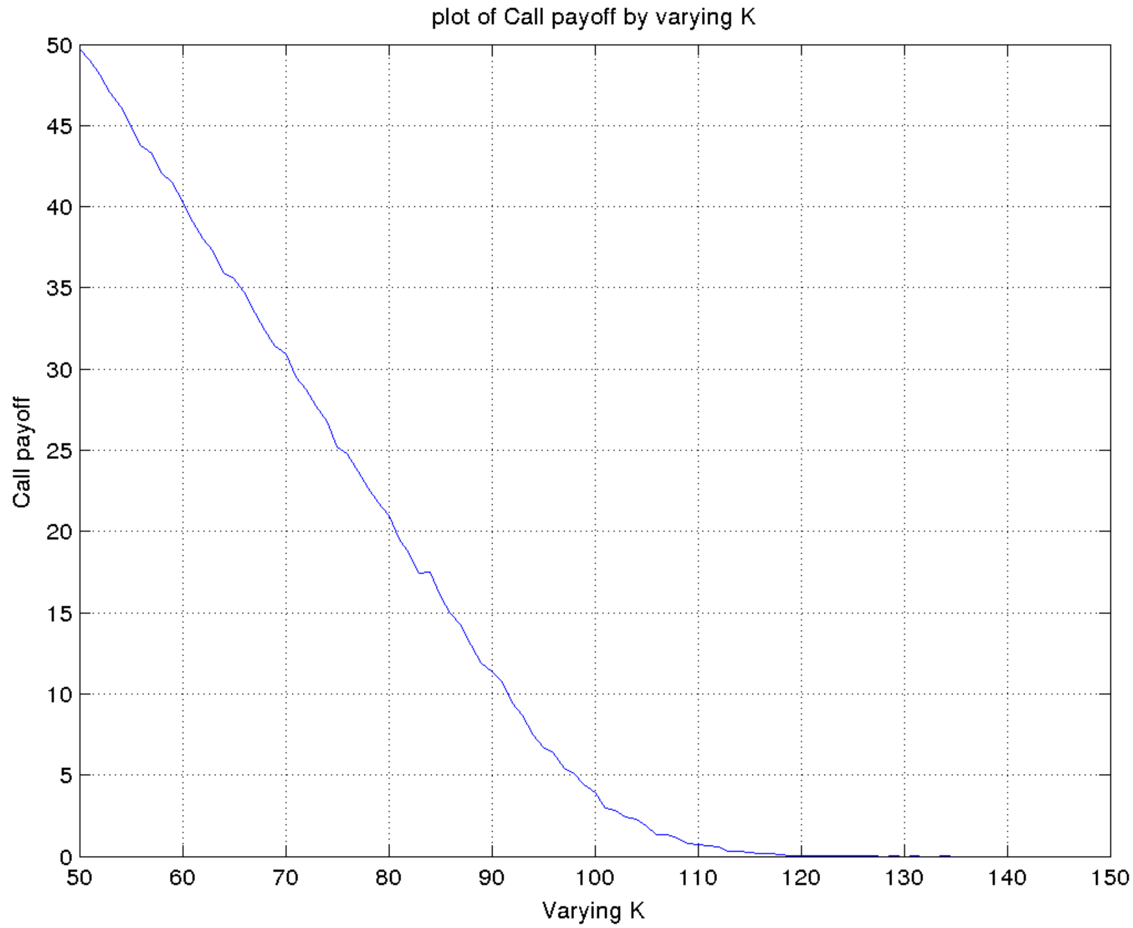
for k = 105 :
for Asian call option confidence intervals are: [1.745049 , 1.789619]
for Asian put option confidence intervals are: [5.391835 , 5.478276]
for k = 110 :
for Asian call option confidence intervals are: [0.671610 , 0.702342]
for Asian put option confidence intervals are: [9.196468 , 9.280195]
for k = 90 :
for Asian call option confidence intervals are: [11.177372 , 11.264307]
for Asian put option confidence intervals are: [0.228759 , 0.241862]

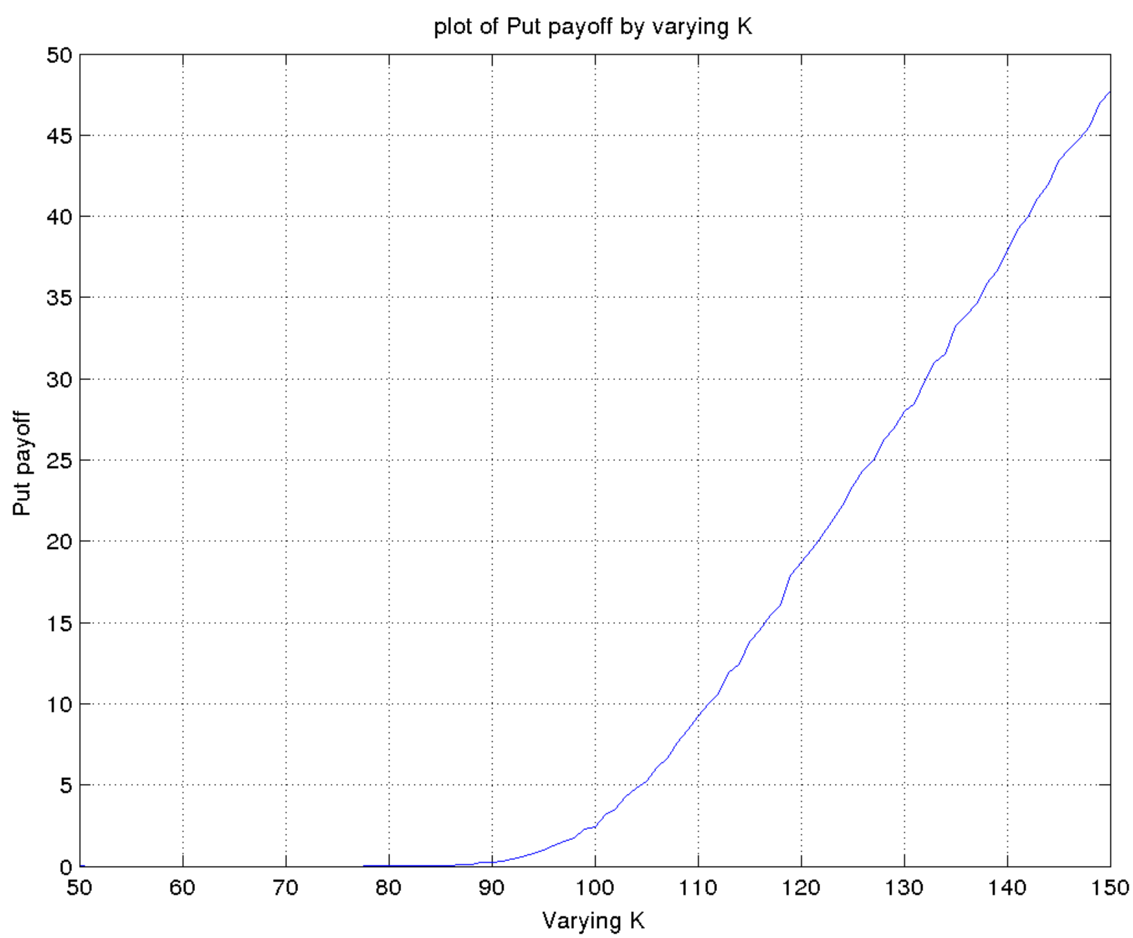
From looking at the above intervals we can say that we are 95% sure that the value of call and put lie in the given ranges for k=105,110 and 90 respectively.

3.

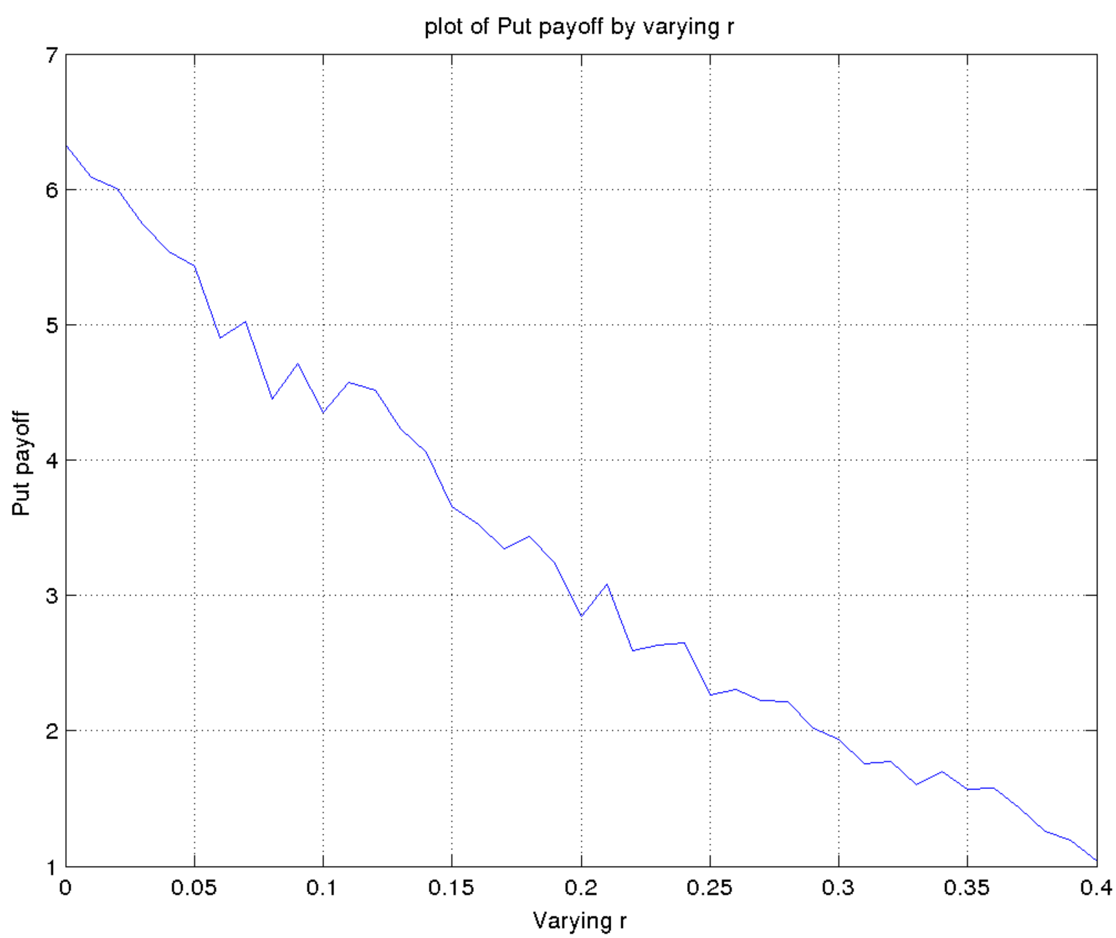

plot of Call payoff by varying initial stock$_p$rice
Call payoff
50
45
40
35
30
25
20
15
10
5


plot of Put payoff by varying initial stock$_p$rice
Put payoff
60
50
40
30
20
10
0
50
60
70
80
90
100
110
120
130
140
150
Varying initial stock$_p$rice

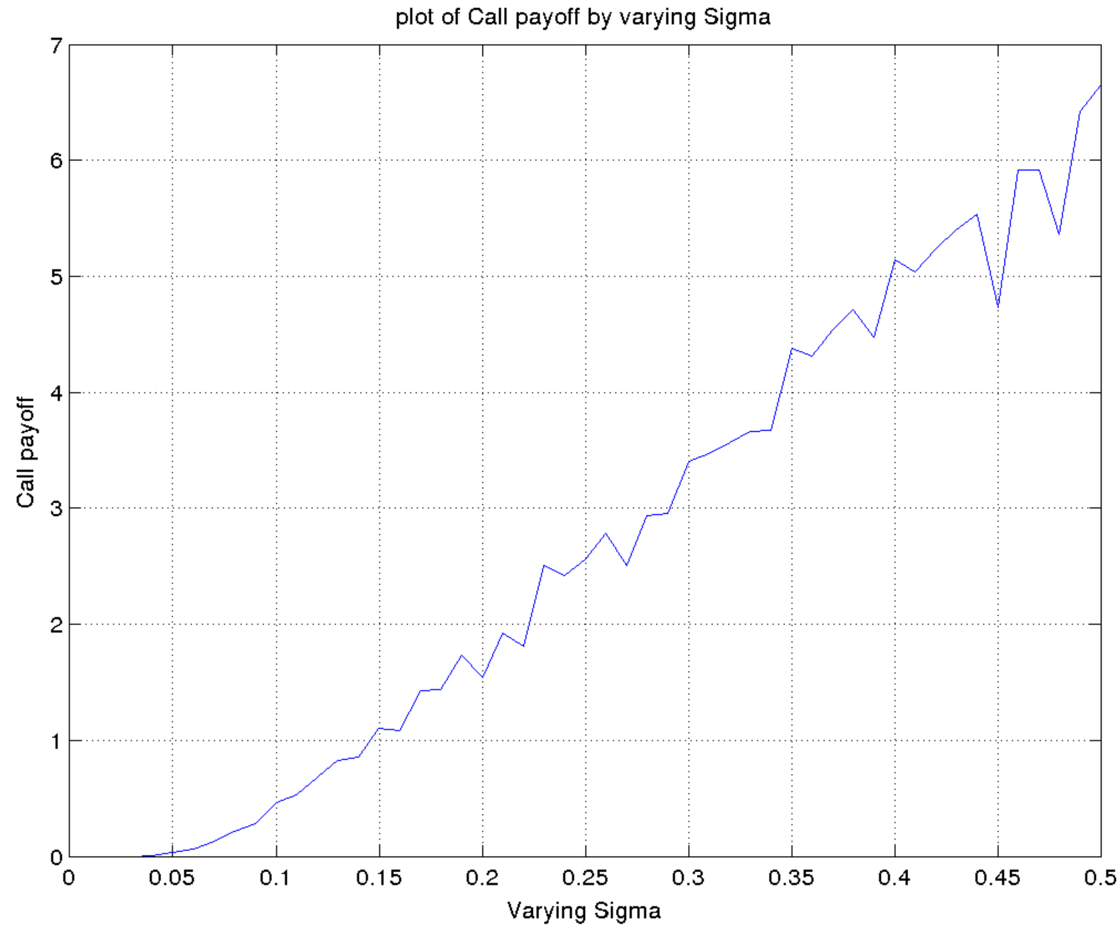

plot of Call payoff by varying K
Call payoff
Varying K
0
5
10
15
20
25
30
35
40
45
50
50
60
70
80
90
100
110
120
130
140
150

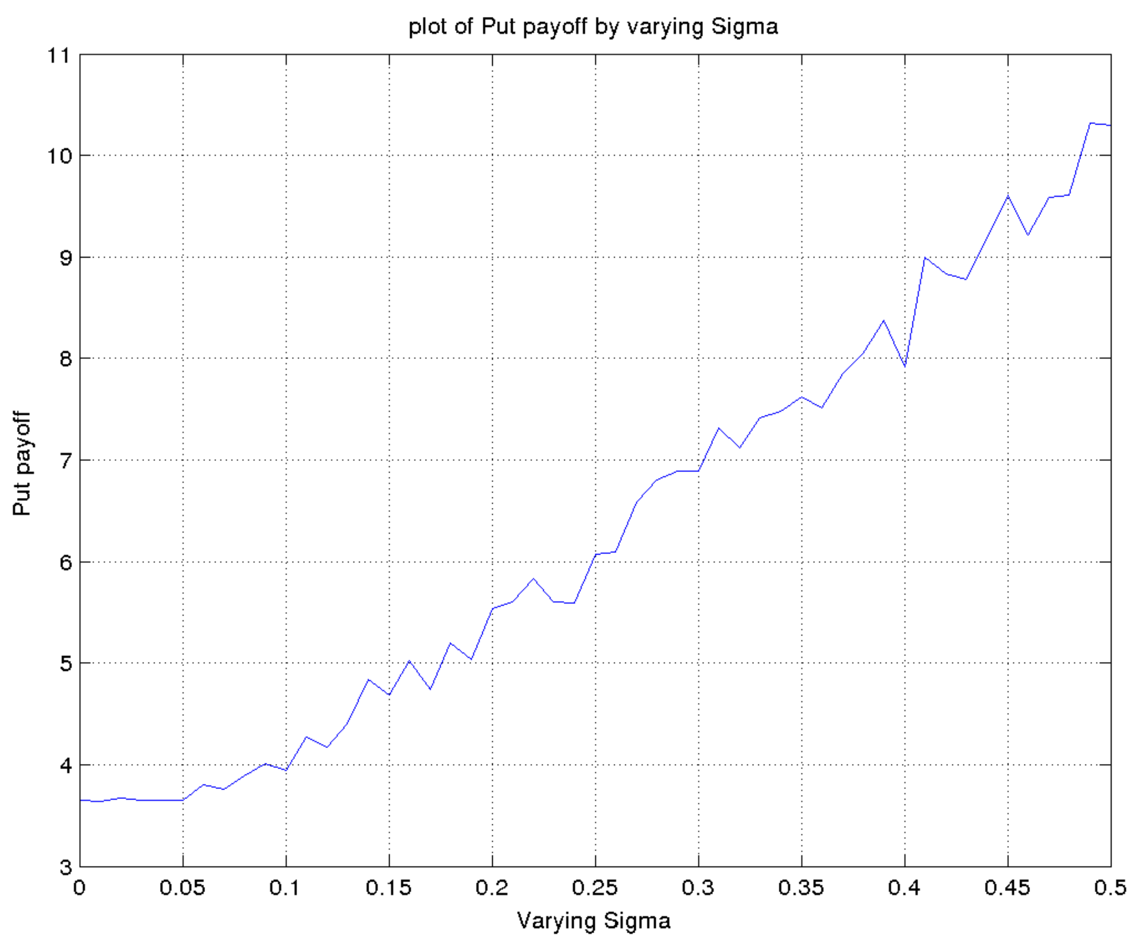

plot of Put payoff by varying K
Put payoff
Varying K
0
5
10
15
20
25
30
35
40
45
50
50
60
70
80
90
100
110
120
130
140
150

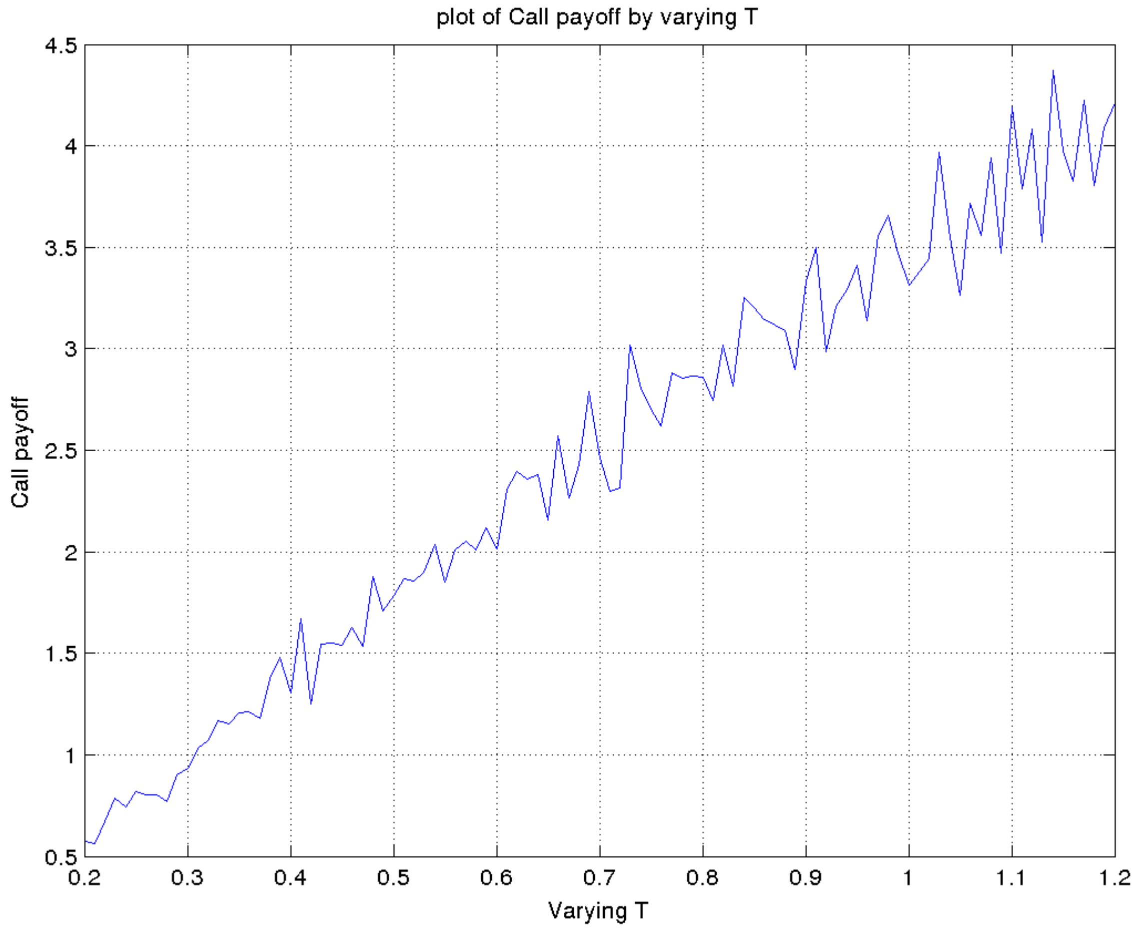
plot of Call payoff by varying r
Call payoff
Varying r
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4

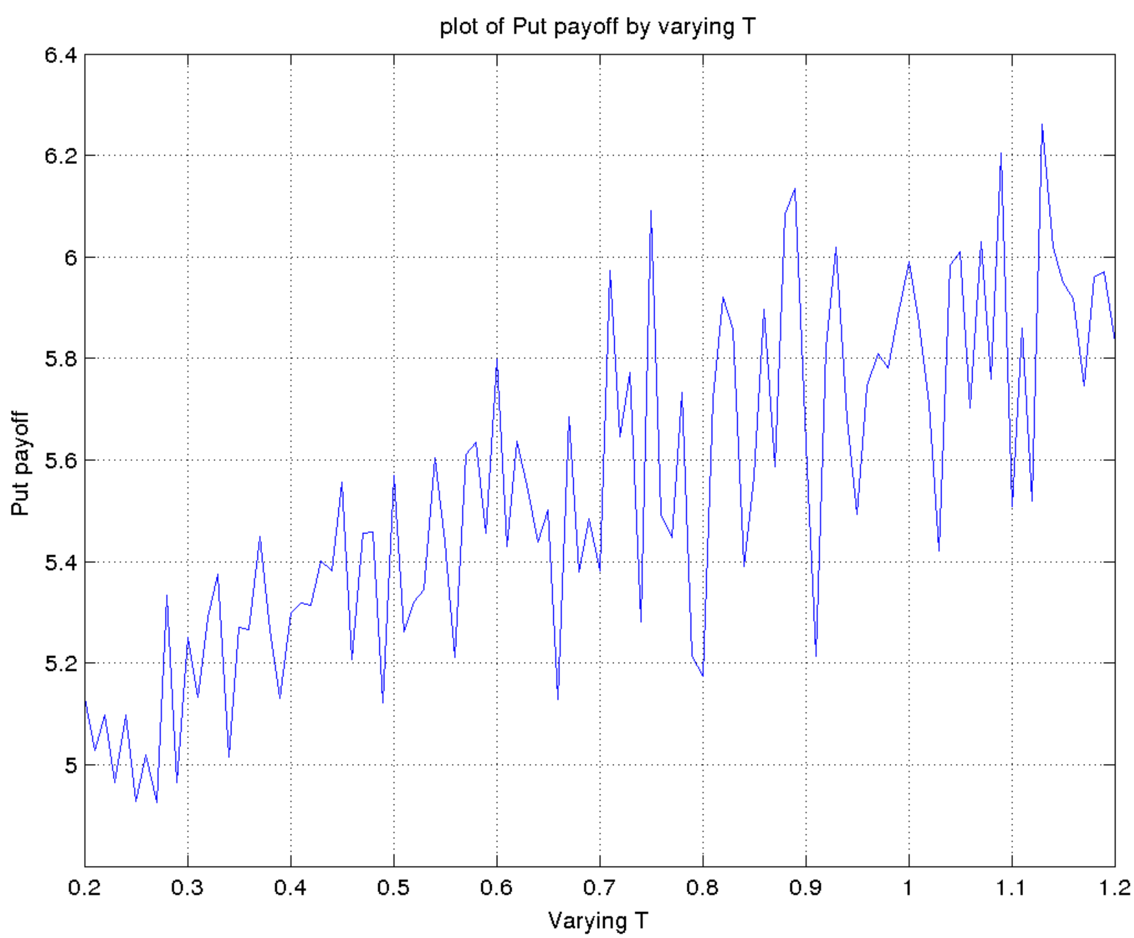


plot of Put payoff by varying r
Put payoff
Varying r
7
6
5
4
3
2
1
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4


plot of Call payoff by varying Sigma
Call payoff
Varying Sigma
0
1
2
3
4
5
6
7
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5


plot of Put payoff by varying Sigma
Put payoff
Varying Sigma
3
4
5
6
7
8
9
10
11
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5


plot of Call payoff by varying T
Call payoff
Varying T
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2


plot of Put payoff by varying T
Put payoff
Varying T
6.4
6.2
6
5.8
5.6
5.4
5.2
5
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2