Writeup Part

1. a) The average delta cost is. The estimate of when we want the probability to accept uphill move is .

So . Using

b) Using the same derivation from 1a), we have

c) Using the same derivation from 1a), we have

d) Using the formula provided in the lecture notes:

And using:

(M affects P2, but since M=1, it doesn’t matter)

We get:

e) Since M does not affect the derivation for , that is, since we always execute SA algorithm for 200 iterations, we have the same formula, ergo the same results. Answer: .

1. Since Cost(1) is the lowest of all costs, we pick as the initial value. Then the differences are . The average of the following is .

Using the derivation from 1a) we have:

So, .

4. a) Using the derivation from 1a) we have:

And using the calculated using method 2, we have

So, .

From 1c) we have:

So, .

Lastly, using

We have:

b) The average CPU time is: 0.021981

c) Using the derivation from 1a) we have:

And using the calculated using method 2, we have

So, .

From 1c) we have:

So, .

Lastly, using

We have:

The average of BestCost after 1100 iterations is similar for both values of P1. However, for P1==0.7, the algorithm is slightly greedier so that it does better initially. P1==0.9 tries to catch up slowly. After many runs, it appears that P1==0.7 performs slightly better.



(Figure taken for 1000 random samples)

d) We saw some improvements after 1000 iterations.

For part b, G=1000 is 9.18e8 and Maxtime=1100 is 9.12e8

For part c, G=1000 is 9.13e8 and Maxtime=1100 is 9.07e8

See graph below for illustration



(Figure taken for 30 random samples)