G52AIM CW2 REPORT

QUESTION 1.

ILS does takes random values throughout the entirety of the search space which means ILS can find the most optimal solution throughout the graph, unlike DBHC which only seeks for the values that are provided by the random permutation and hence finds a local optimum that are in the range of the provided values.

QUESTION 2.

2A.

If IOM is too low and DOS is too high, the algorithm will provide a more precise (correct answer for the optimum) due to the DOS. However, since the mutations are too low, it might not be able to escape from the local optimum (it would get stuck on a cycle) since the algorithm works by accepting the improving solutions depending on DOS which means it would only bring that local optimum as the final solution since it won't explore the other optimums in depth. Apart from those the increase in DOS would result in a longer search time since the algorithm will try to discover the optimum in full depth.

2B.

If IOM is too high and DOS is too low, the algorithm would not get stuck in a local optimum since the search space widens. However, since the algorithm doesn't explore the deepest of the best solution, the answer might not be precise or accurate enough. Time could become a problem too depending on the mutation intensity.

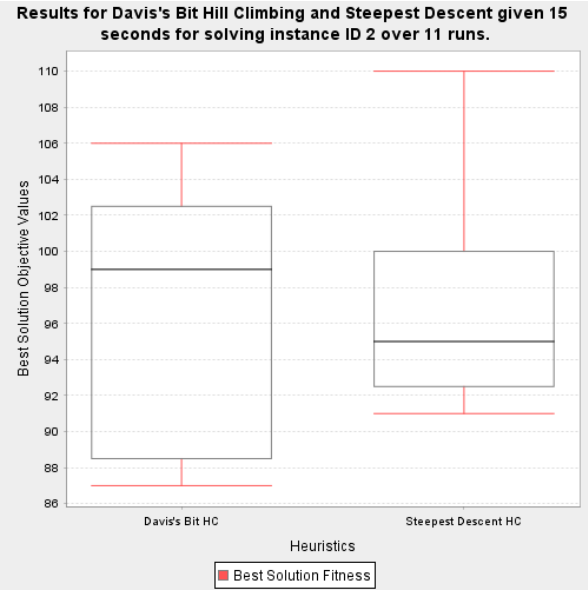
QUESTION 3.

DBHC would perform better in this case because DBHC takes random values and it tries to find the most optimal solution around the optimal. In this case, ILS will find a single local optimal and it will keep exploring the same optimal repeatedly whereas DBHC would explore every single optimal and find the best value among those.

QUESTION 4.

Given enough time ILS would be better since ILS uses SDHC for doing local searches and with a higher time budget the SDHC out performs DBHC in terms of precision and accuracy.

QUESTION 5.



As it could be seen on the graphs, ILS performs better than DBHC in this case. With respect to the generated graphs, it is possible to see that ILS managed to compute a lower value than DBHC which means the result is more accurate. Moreover, it is also possible to see that the distance between percentiles and quartiles of ILS is shorter which makes the answer more precise compared to DBHC. Lastly, the graph for ILS is more normally distributed compared to DHBC which means the values used for the solution are distributed evenly.