1. **Hypothesis:**

   Algorithm A* is more efficient than Branch-and-Bound for terrain map and the efficiency of A*'s gain will be better for closer and therefore, more accurate estimates.

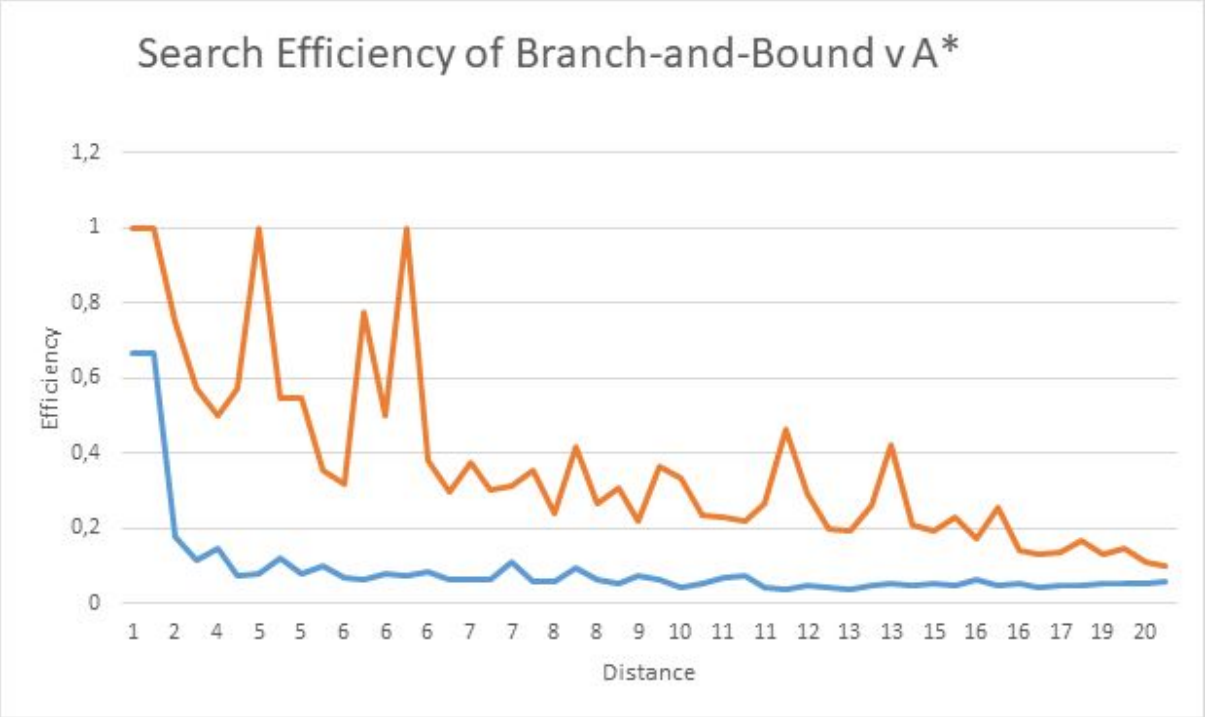
2. **Metrics:**

   Measured factors:

   - The nodes needed to achieve the minimum or maximum result and therefore labour consumption of the method
   - The relation of distance to the accuracy of final result given (accuracy of the estimates)

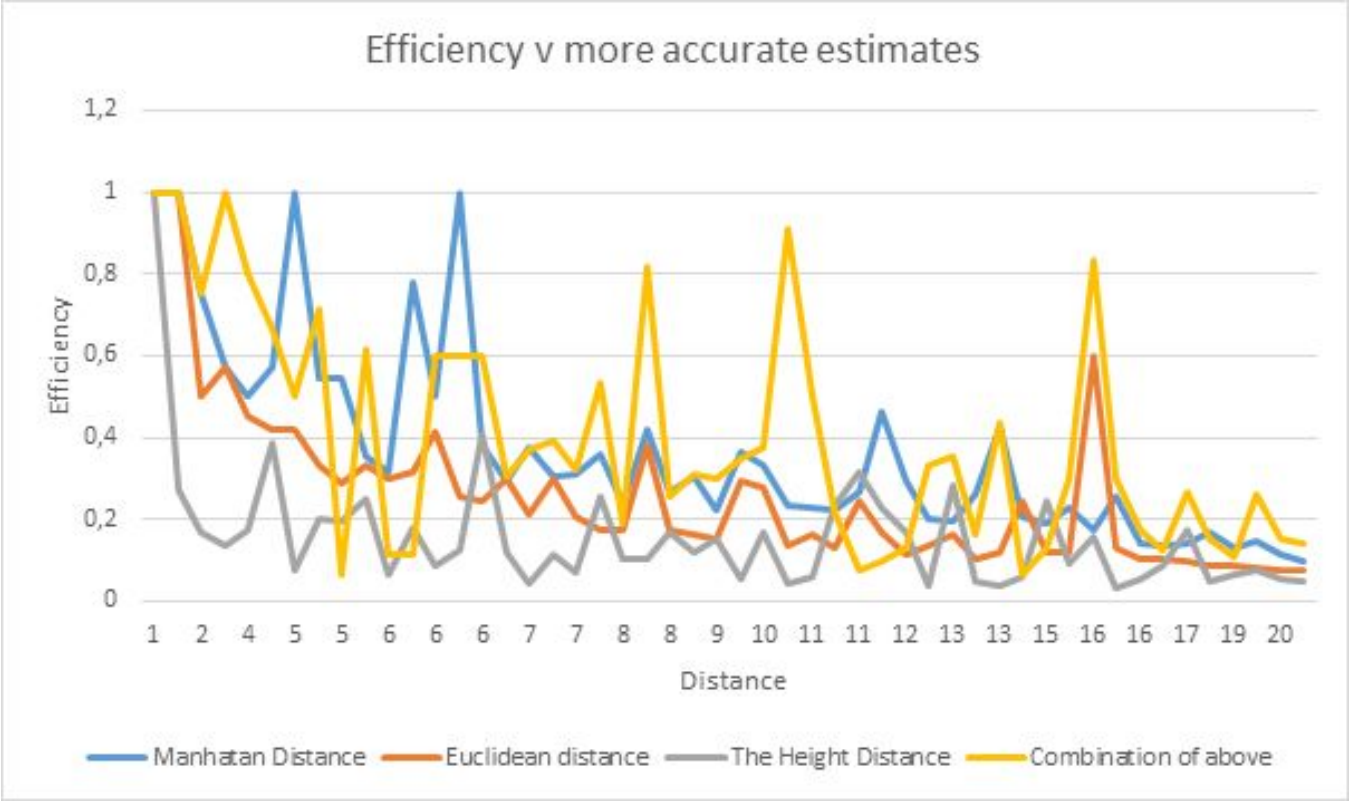
3. **Testbed:**

   To compare efficiency of the Branch-and-Bound with A* I used a terrain map. I ran Branch-and-Bound search algorithm with 50 different starting and ending points to measure how distance between these points influences efficiency. I proceeded in the same manner with A* with "Manhattan Distance" accuracy. I presented the result of this experiment in the graph below.



According to data results, method A* is more efficient that Branch-and-Bound.

I have done the same thing for different accuracy in A* to prove that in this algorithm efficiency gain is better for more accurate estimates. I screened the results on the graph below.



According to graph the least efficient estimation is “The Height Distance” and the most efficient is Combination of “Manhattan and Height Distance”.

4. Summary

After testing, we can see that our hypothesis is proven, as implementing A* search into our program has given the best results, at least in comparison to Branch-and-Bound - which is already supposed to be a better algorithm than depth-first or breadth-first alone. When comparing results with several possible estimates, we find that the Manhattan distance seems to work best - something that makes sense because of the Rambler’s peculiar manner of moving (it is only allowed to move vertically or horizontally, never diagonally).