Beam search algorithm: different beam-sizes

Heuristics – Case: Fruit fly
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Goal of experiment:
The goal of the current experiment is to determine the influence of the beam size on the number of inversions to the solution.

Methods:
The beam search algorithm selects an n number of children per layer based on heuristics (breakpoints). Varying the beam size changes how many children per layer are pruned. The current experiment will be executed on the Drosophila Melanogaster genome of length 25.

Results:

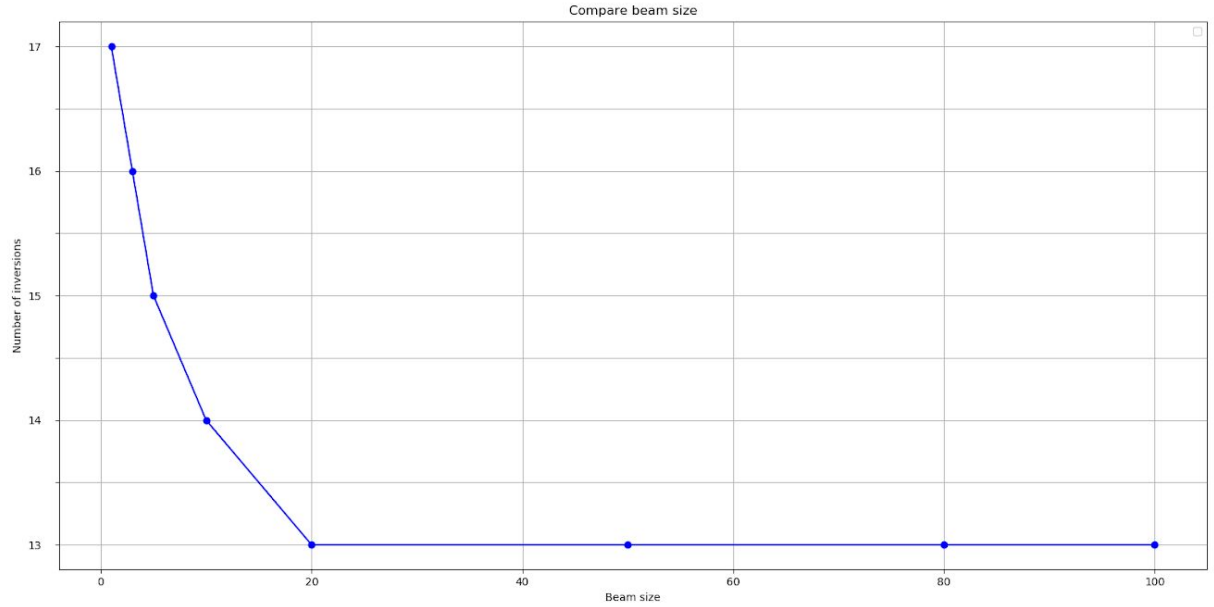

Figure 1. The influence of the beam size on the number of inversions to the solution.

Discussion:
It seems that with a beam size of 20 the shortest path is found after 13 inversions. Beam sizes smaller than 20 find solutions with a higher number of inversions. This might implicate that a beam size smaller than 20 prunes good children for the solution. Therefore, a beam size smaller than 20 is not recommended.

Conclusion:
The beam search algorithm with a beam size of at least 20 seems to find the shortest path to the solution: 13 inversions.