Walmart Datathon

Aditya Vijayvergia
Harshul Soni

Problem

Variant of travelling salesman problem

NP hard

Problem definition:

Black Friday is coming, and Walmart has a lot of great deals for its customers. As a smart shopper, you will use computer to make a plan to visit the in-store deals as quick as possible.

Input Data

- Store Map
- Location of deals
- Traffic heatmap

Approach

Modified Breadth First Search: steps in weight (0.1 step size)

Minimum Spanning tree type approach with restriction of adding nodes only at the corners

BFS allowed avoiding O(log(n)) computational complexity associated with other minimum spanning tree algorithms that use priority queue, 2-3 tree, etc

Heuristic approach:Breadth First Search used to find cost for edges

Algorithm explained

BFS processes graph level wise when edge weights are same (or irrelevant to task)

BFS modified to proceed by a step size of 0.1 in each cycle instead of moving by 1 complete edge. So any edge can be covered in max 10 steps.

Applicable as edge weights in range 0 to 1.

Relevant as consumers a not capable of detecting the intensity of crowd very precisely. They just move in the direction which looks approximately less crowded

Preprocessing

Image compress to 250 x 400

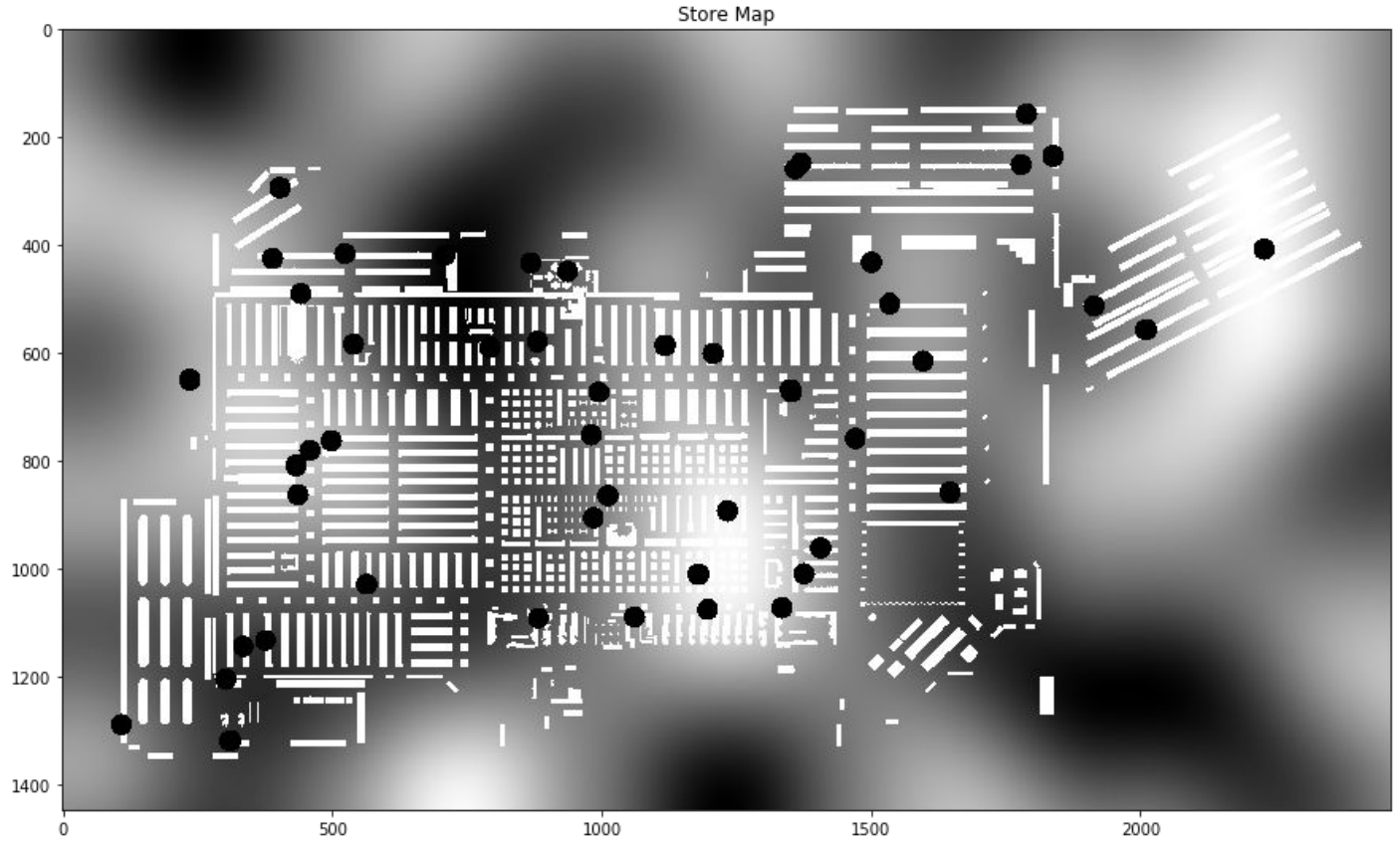
max and min poolings used for image compression

- Max pool thickens white color
- Min pool makes it thinner - over all boundaries conserved

Large enough image ensures no crossing of obstacles

Algo optimized to work fast on sufficiently large image as well

Starting image



Final Output