The application of A* IDA* algorithms was requested. For the heuristics, Euclidean distance and Manhattan was selected.
Manhattan was preferred over alternatives due to the application. Manhattan, also called Taxicab geometry, is good at calculating distances with turns and is preferred over Euclidean distance when lots of dimensions are present.

Known issues.

For the A*, the exercise requires that w is an integer. The experiments have been run with both integers and decimals.

For IDA*, the amount of nodes visited contains duplicates. This messes with the numbers but not the final route taken.

Measurements

Scenario 1 A* Euclidean:

Weight (w)	Amount of nodes	Heuristic Cost	Estimated Cost
1	50	32.5	35.077
1.2	23	32.5	35.144
1.5	23	32.5	35.144
1.8	23	32.5	35.144
2	23	32.5	35.144
5	23	32.5	35.144

Scenario 1 A* Manhattan:

Weight (w)	Amount of nodes	Heuristic Cost	Estimated Cost
1	131	32.440	35.146
1.2	129	32.440	35.146
1.5	120	32.440	40.500
1.8	52	32.440	49.500
2	52	32.440	49.500
5	44	32.440	49.500

Scenario 2 A* Euclidean:

Weight (w)	Amount of nodes	Heuristic Cost	Estimated Cost
1	308	52.5	55.355
1.2	51	52.5	55.393
1.5	80	52.5	55.393
1.8	123	52.5	55.393
2	147	52.5	55.393
5	205	52.5	55.393

Scenario 2 A* Manhattan:

Weight (w)	Amount of nodes	Heuristic Cost	Estimated Cost
1	217	52.433	55.337
1.2	90	52.433	63.000
1.5	88	52.433	63.000
1.8	85	52.433	63.000
2	85	52.433	63.000
5	95	52.433	63.000

Scenario 3 A* Euclidean:

Weight (w)	Amount of nodes	Heuristic Cost	Estimated Cost
1	409	57.537	69.084
1.2	367	57.537	69.084
1.5	289	57.537	69.084
1.8	390	57.537	69.084
2	425	57.537	69.084
5	461	57.537	69.084

Scenario 3 A* Manhattan:

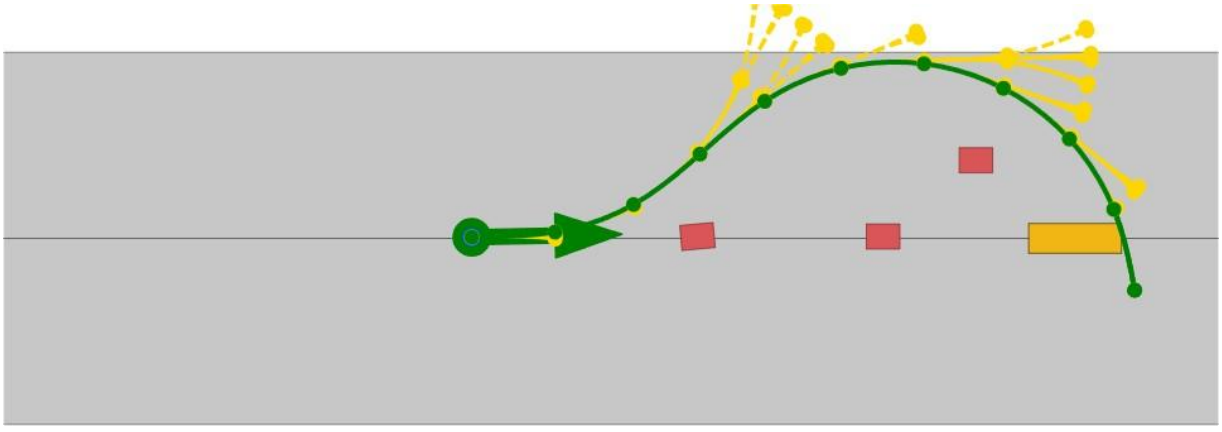
Weight (w)	Amount of nodes	Heuristic Cost	Estimated Cost
1	402	55.433	69.084
1.2	397	55.433	69.084
1.5	351	55.433	69.084
1.8	406	55.433	69.084
2	406	55.433	69.084
5	421	55.433	69.084

Scenarios IDA*

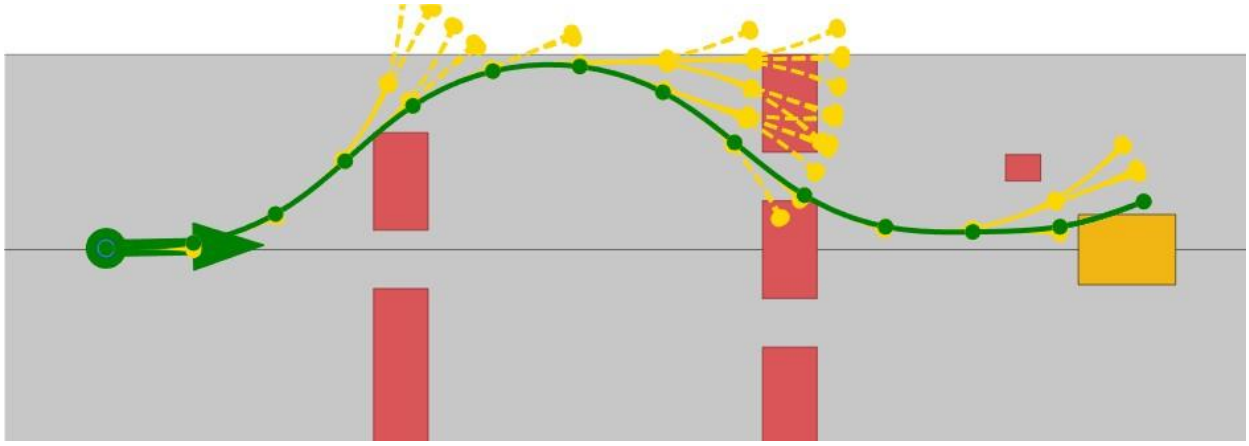
	Amount of nodes	Heuristic Cost	Estimated Cost
Scenario 1 Ευκλ.	560	32.500	35.077
Scenario 1 Manhattan	61	32.440	35.212
Scenario 2 Ευκλ.	17886	52.500	55.355
Scenario 2 Manhattan	89	52.433	55.393
Scenario 3 Ευκλ.	34763	57.537	69.084
Scenario 3 Manhattan	25878	55.433	76.500

Noted results:

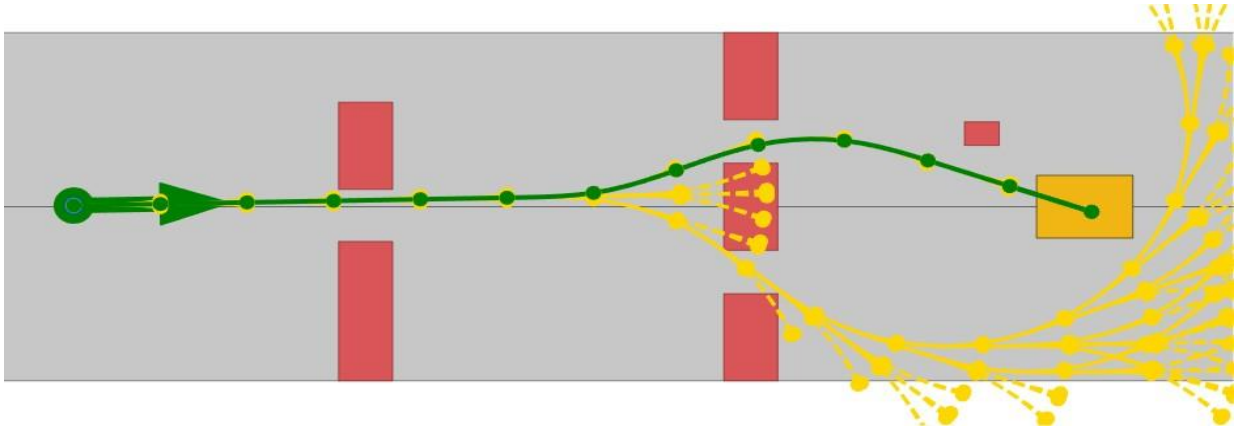
Scenario 1 using A* Manhattan with weight 2+, the algorithm overshoots the finish and goes through it.



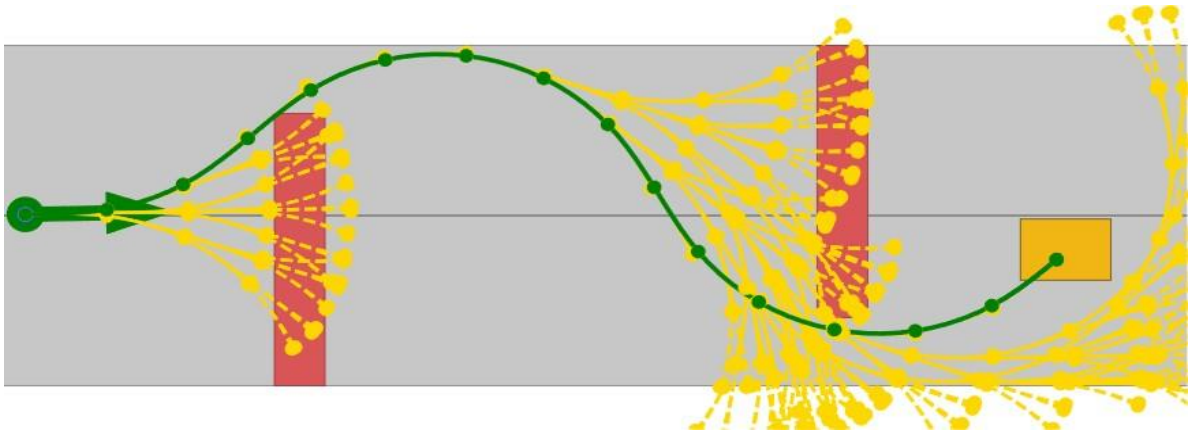
Same for scenario 2



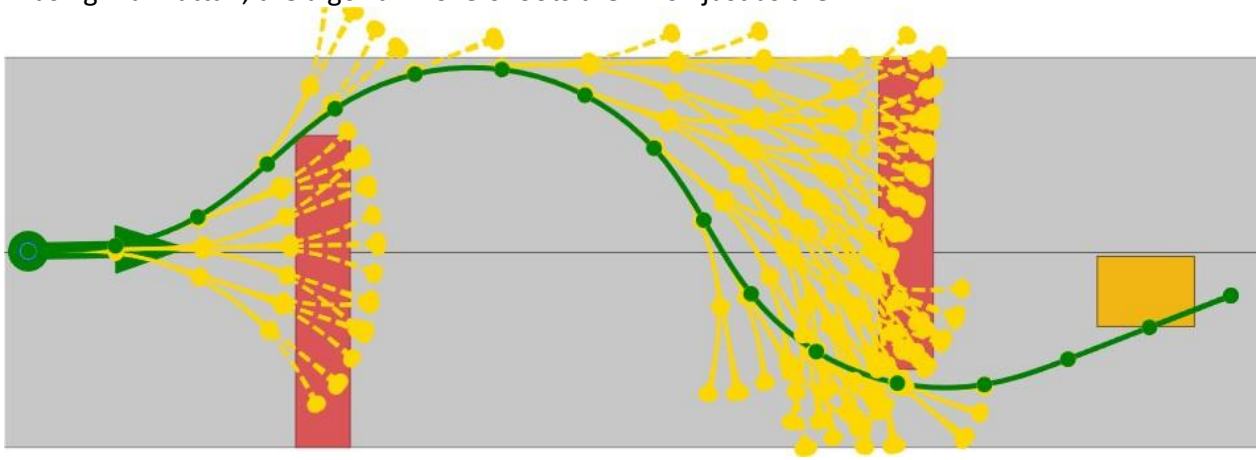
Using Euclidean distance in scenario 2 for weight 2+, the algorithm starts doing a circle around the finish and then goes out of bounds.



Same for scenario 3



IDA* using manhattan, the algorithm overshoots the finish just as the A*



Results

From the results, the following can be seen: a simple scenario with few obstacles like scenario 1, Euclidean distance is more efficient regardless of weight. This is expected as the shortest path after dodging the obstacle is a straight line. However, when more obstacles are added and the weight increases, Manhattan is far more efficient. IDA* cannot be fully assessed due to the issue with my code.