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Project #1

AL AKHAWAYN UNIVERSITY in Ifrane

School of Science and Engineering

CSC 4301 01: Intro. to Artificial Intelligence

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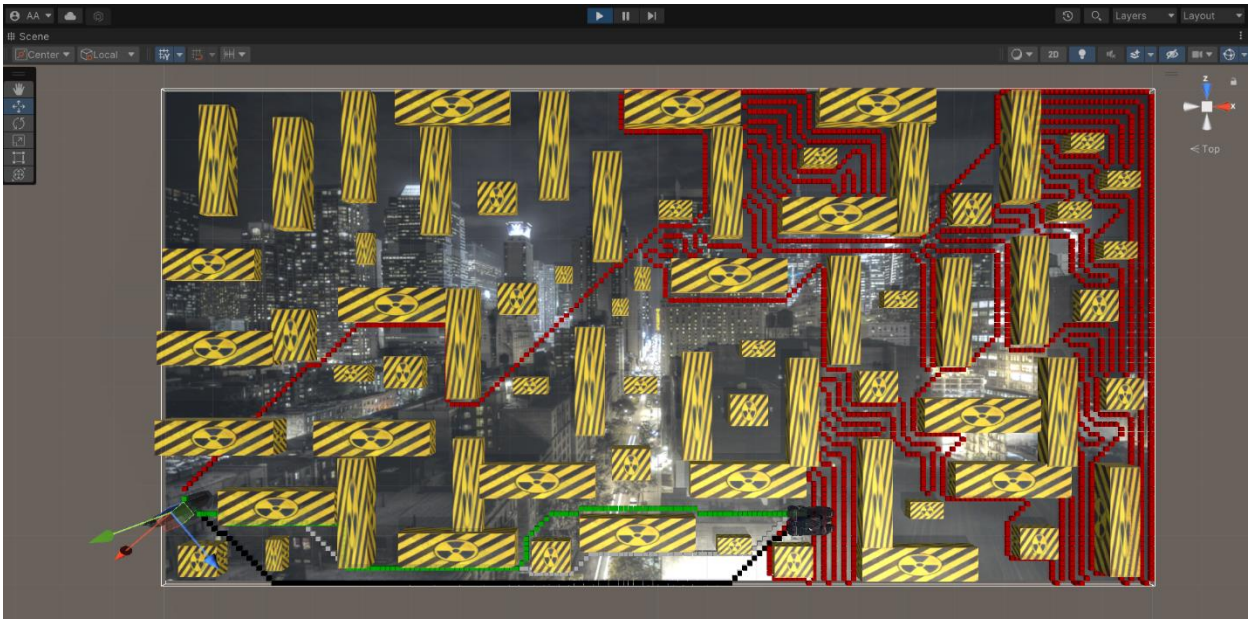
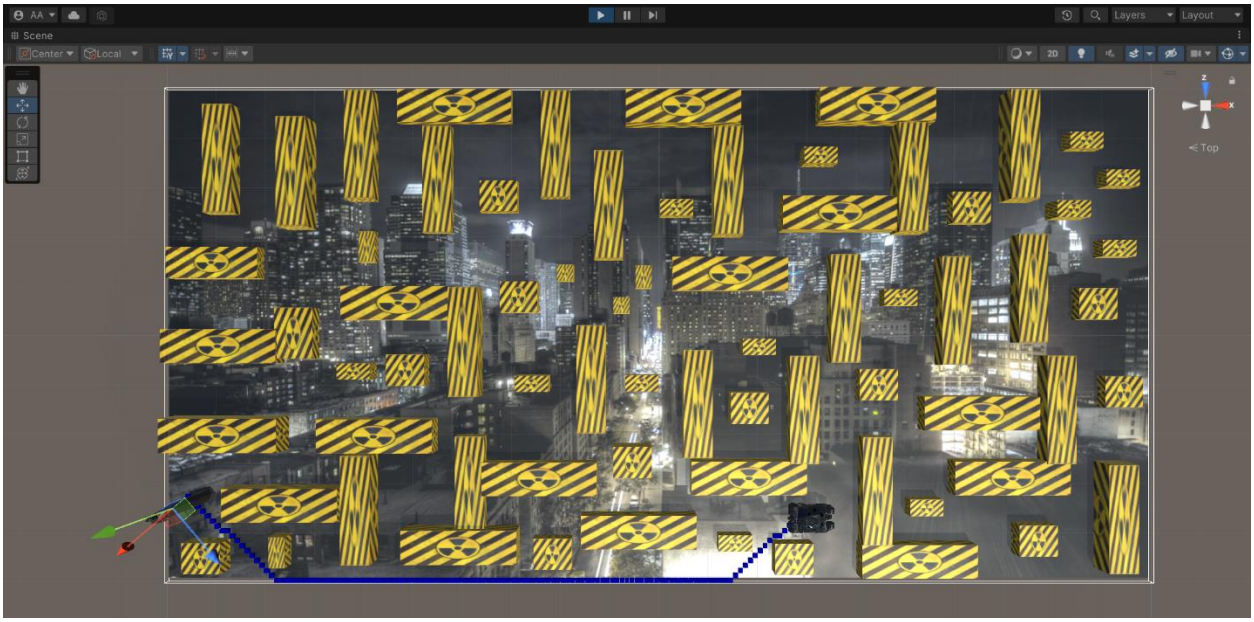
In this project we are trying to help batman reach his bat mobile, while avoiding the nuclear buildings along the way, knowing also that batman has many ways to reach his bat mobile.

All the ways to reach the bat mobile:

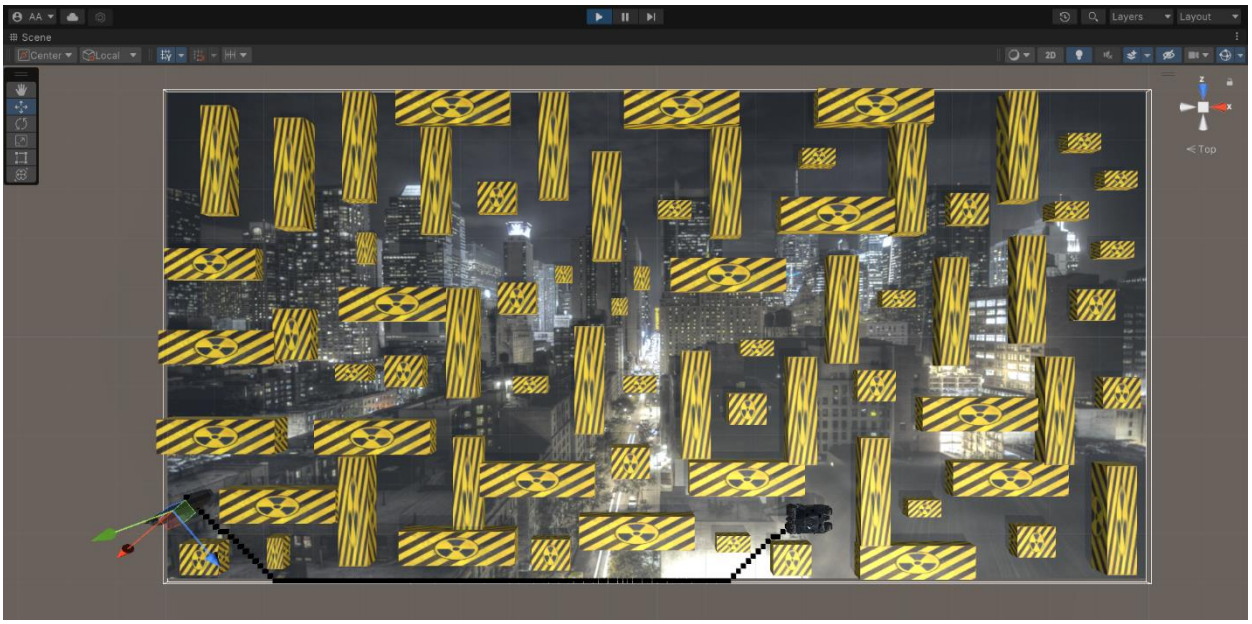


DFS:

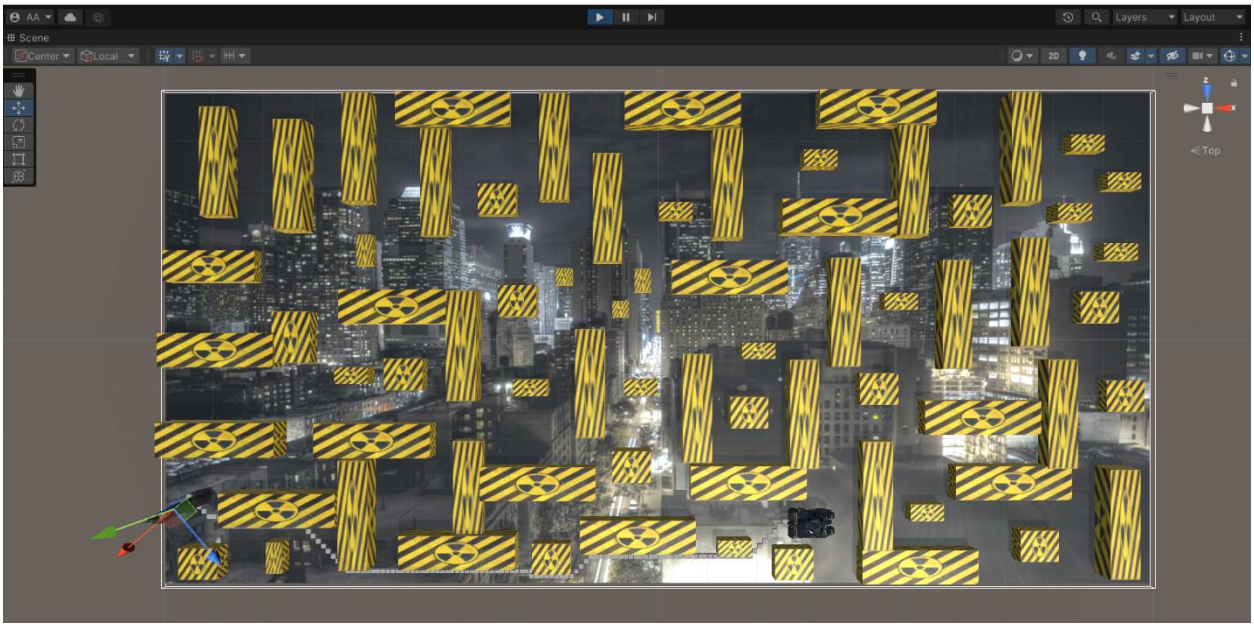
BFS:



UCS:

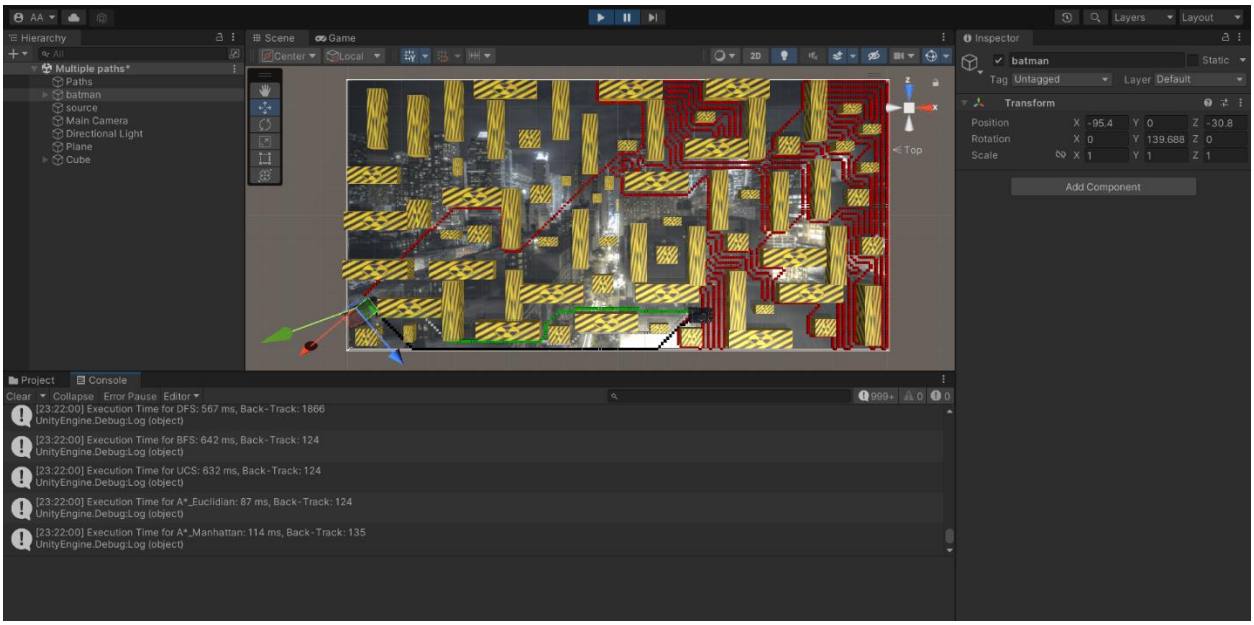


A* Euclidian:

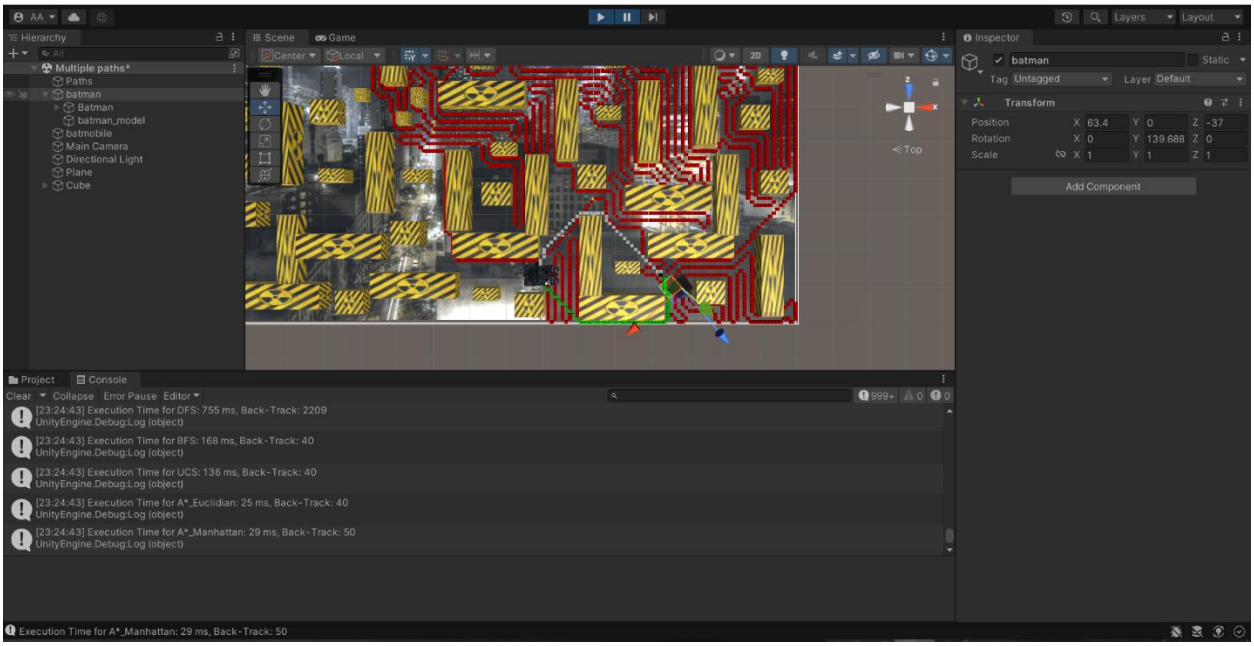


A* Manhattan:

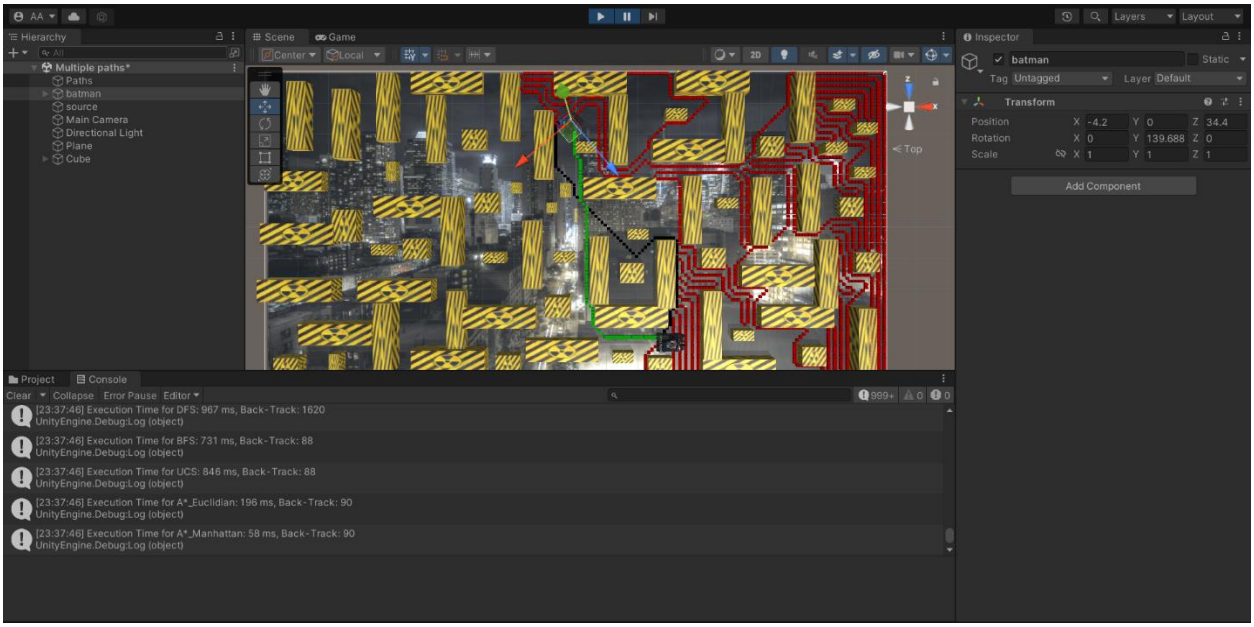
Moving now to how much time it takes, and the number of nodes processed for each type of the search algorithms:



In this case where batman is standing very far from the bat mobile, As you can see from the picture provided above, the search method A* with the Euclidian heuristics is the method that consumes the least time which is 87 ms followed by A* with the Manhattan heuristics that takes 114 ms, followed by DFS with a time consumption of 567 ms, followed by UCS with a time consumption of 632 ms and finally BFS with a time consumption of 642 ms.



Another example for the time consumed by each search method: for this case where batman is standing relatively close from the bat mobile, the search method A* with the Euclidian heuristics is the method that consumes the least time which is 25 ms followed by A* with the Manhattan heuristics that takes 29 ms, followed by a UCS with a time consumption of 136 ms, followed by BFS with a time consumption of 168 ms and finally DFS with a time consumption of 755 ms.



Another example for the time consumed by each search method: for this case where batman is standing relatively close from the bat mobile, the search method A* with the Manhattan heuristics is the method that consumes the least time which is 58 ms followed by A* with the Euclidian heuristics that takes 196 ms, followed by a BFS with a time consumption of 731 ms, followed by UCS with a time consumption of 846 ms and finally DFS with a time consumption of 967 ms.

The Fringe:

The console also produces the fringe, the picture below represents a small part of the fringe(because of how big it is, we could not include the whole thing but you can try to access it

through the code and see for yourself):