

Astar and DFS Search



Description

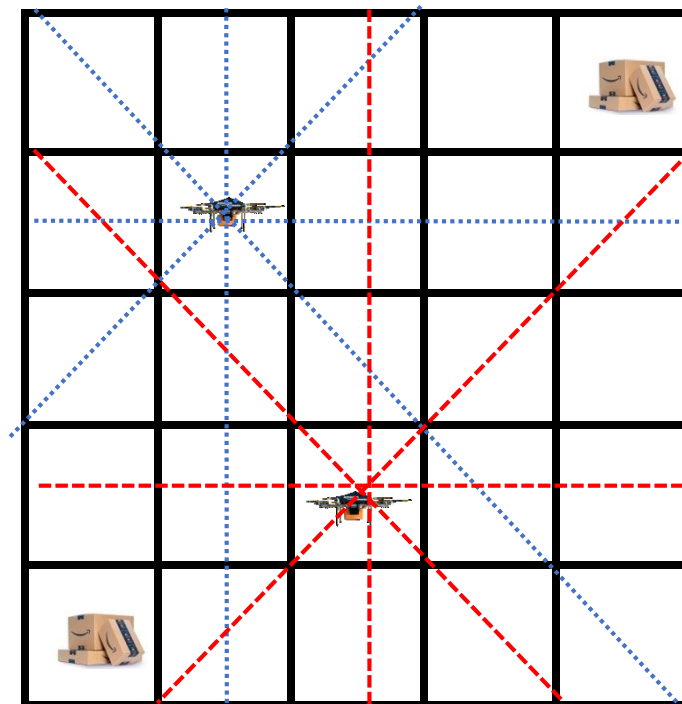
You are helping Amazon to place drone in a city to quickly deliver packages. According to the news, Amazon is developing a future delivery system to get packages delivered in less than 30 minutes via unmanned aerial vehicles (drones). To avoid unexpected collisions and interruptions from other drones, there are some rules that must be satisfied when choosing the positions (served regions) of these drones – a drone only flies within its own region. Here, we use a grid system to represent the different regions of a city.

The goal of your project is to place the drones in locations that do not conflict with each other, while maximizing the total number of packages delivered for the day. You must follow the following guidelines:

- Drones cannot be in the same square, same row, same column, or along the same diagonal. (Think of the 8 queens on a chess board)
- Packages get delivered when drones are in same square as packages. Each drone can take one or more packages.
- Once the drone's position gets assigned, it's not permitted to change.
- All drones must be allocated.
- The grid coordinate system will be indexed starting from the top-left corner. An example of a 5 by 5 grid is given below with each cell's coordinates:

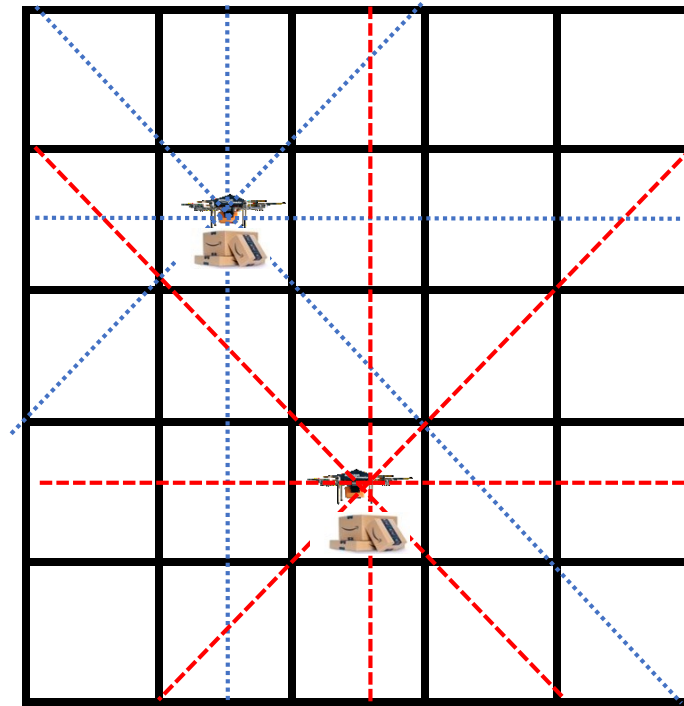
0,0	0,1	0,2	0,3	0,4
1,0	1,1	1,2	1,3	1,4
2,0	2,1	2,2	2,3	2,4
3,0	3,1	3,2	3,3	3,4
4,0	4,1	4,2	4,3	4,4

Example 1



The two drones have been placed. The red and blue lines show the limitations on placing drones; no drones may be placed on the same row, column, or diagonal as another drone. Since no packages are in the same square as either of the drone, no value is gained in Example 1.

Example 2



Since both packages are in the same square as the drones, two packages get delivered in Example 2.