# 1. stroy definition

requirement: assignment

DoD(**Definition of Done**):

1. Full source code.
2. Build script that will compile and build the artifacts. Note, this should be a .bat or .sh and not expect us to install anything extra to compile/build.
3. Run script that will generate the output in file called **output.dat**. Please do also a .bat or .sh file too.
4. readme.txt, to specify the build and run steps

# 2. component design

there 2 components in this project,

## 1. read data

this component read data from input file. the file format is described in assignment document.

class name: InputDataProvider, it exposes below method:

method: GetMapDataSet, return MapData array.

definition: MapData[] GetMapDataSet()

## 2. algorithm

this component implements Dijkstra shortest path algorithm, which can solve the problem described in assignment.

input data is MapData.

logic:

1. use BFS(breadth first search)
2. the weight of all edges in the graph is 1.
3. create state array, state include: marked, step, gas collected,
4. we need use queue to store pointer of state in search process.
5. method to get adjacent vertices use rule to get list.
6. relaxation method need check gas collected.
7. search will end if:

1. all vertices with same step as end point in queue are relaxed;

2. empty queue, it means can not reach end point

# 3. test plan

we need create unit test for those 2 components.

# 4. implement code

# 5. deploy