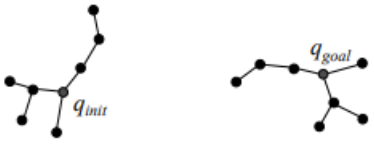
ME766A ASSIGNMENT-2

MOHAMMED SOHAIB 200611

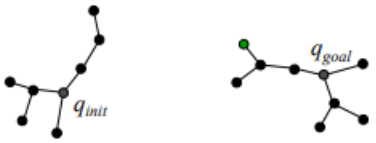
1)RAPIDLY EXPANDING RANDOM TREE.

Basic concept on this:

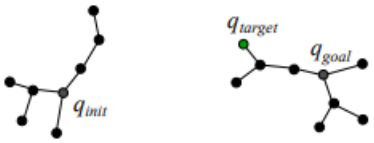
A single RRT-Connect iteration...



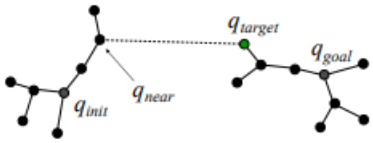
1) One tree grown using random target



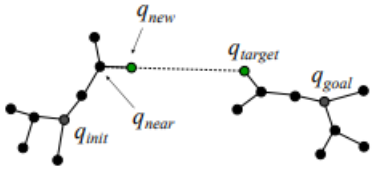
2) New node becomes target for other tree



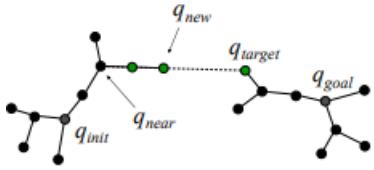
3) Calculate node "nearest" to target

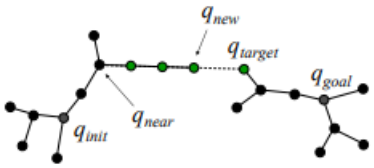


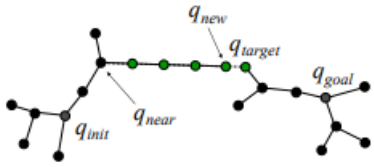
4) Try to add new collision-free branch



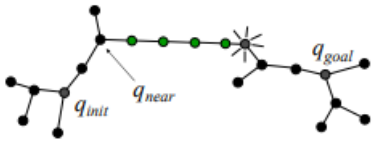
5) If successful, keep extending branch



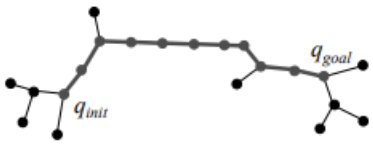




6) Path found if branch reaches target



7) Return path connecting start and goal

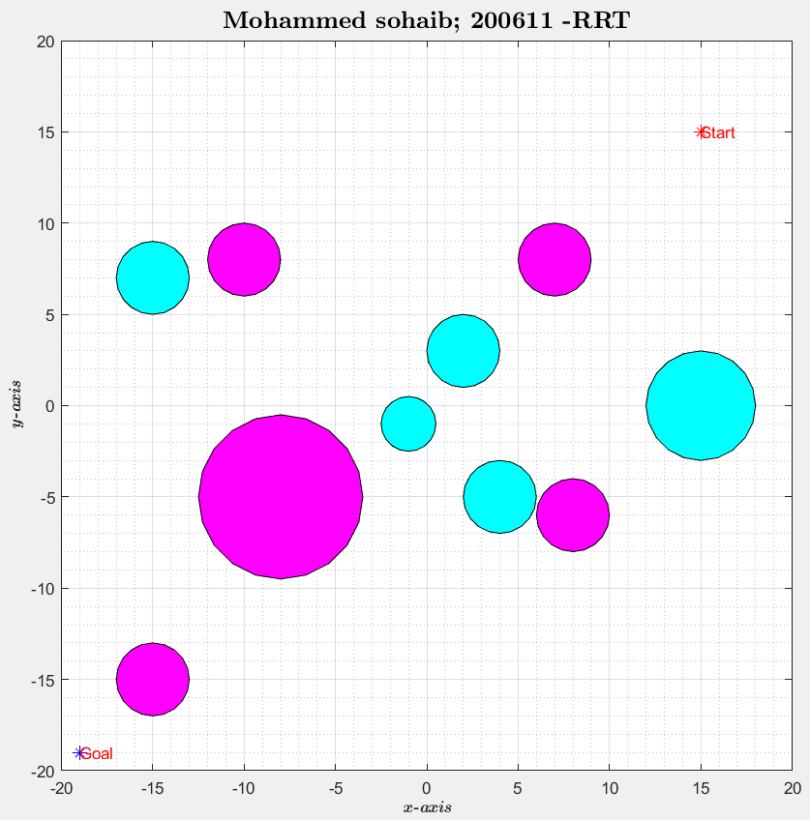


Basic RRT Algorithm:

```
RRT_CONNECT (q_init, q_goal) {
  T_a.init(q_init); T_b.init(q_goal);
  for k = 1 to K do
    q_rand = RANDOM_CONFIG();
    if not (EXTEND(T_a, q_rand) = Trapped) then
      if (EXTEND(T_b, q_new) = Reached) then
        Return PATH(T_a, T_b);
    SWAP(T_a, T_b);
  Return Failure;
}
```

Instead of switching, use T_a as smaller tree. This helped James a lot

WORK SPACE:

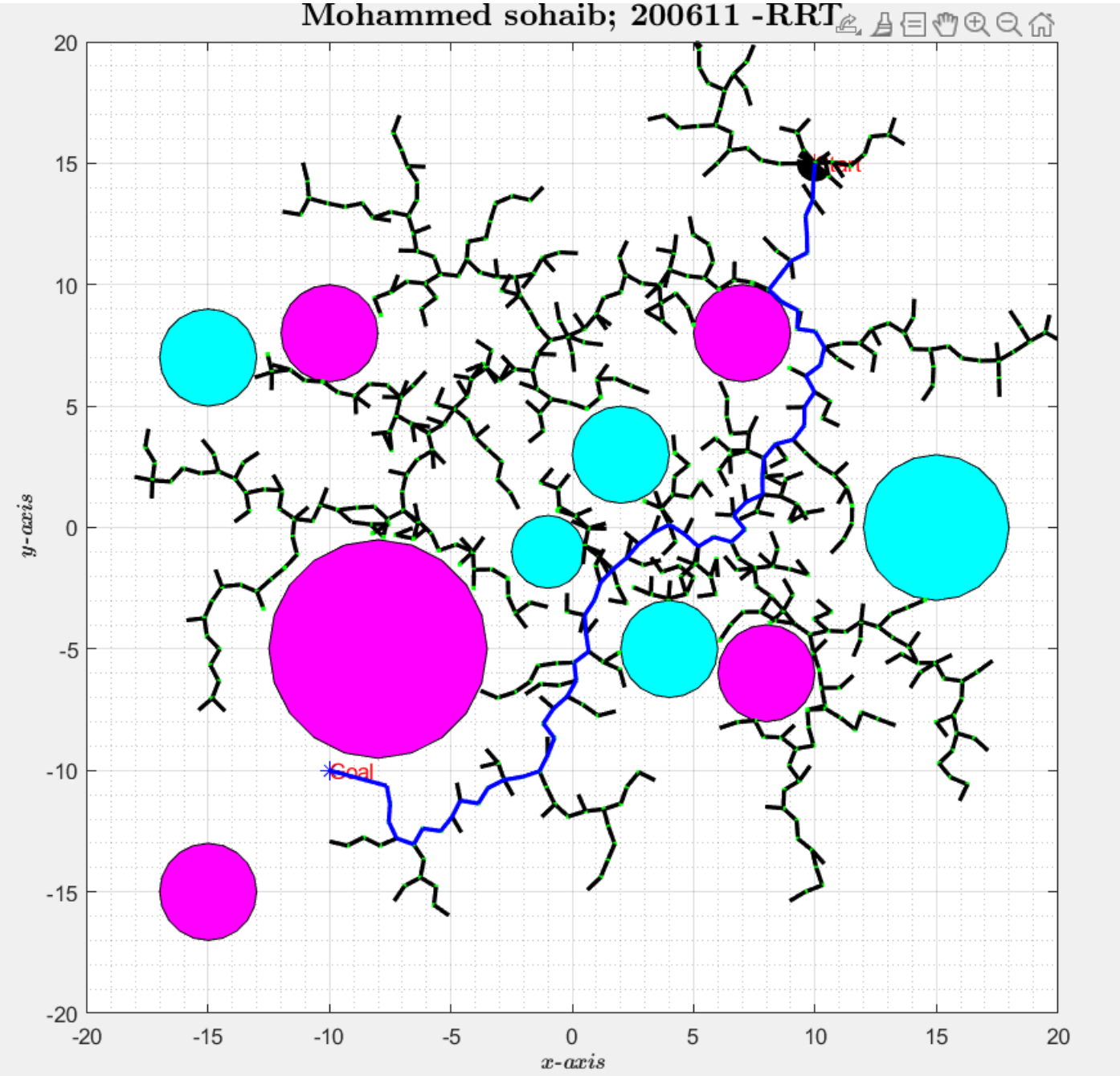


##All the required code is at the end of this document.

START: `[10 15]`

END: `[-10 -10]`

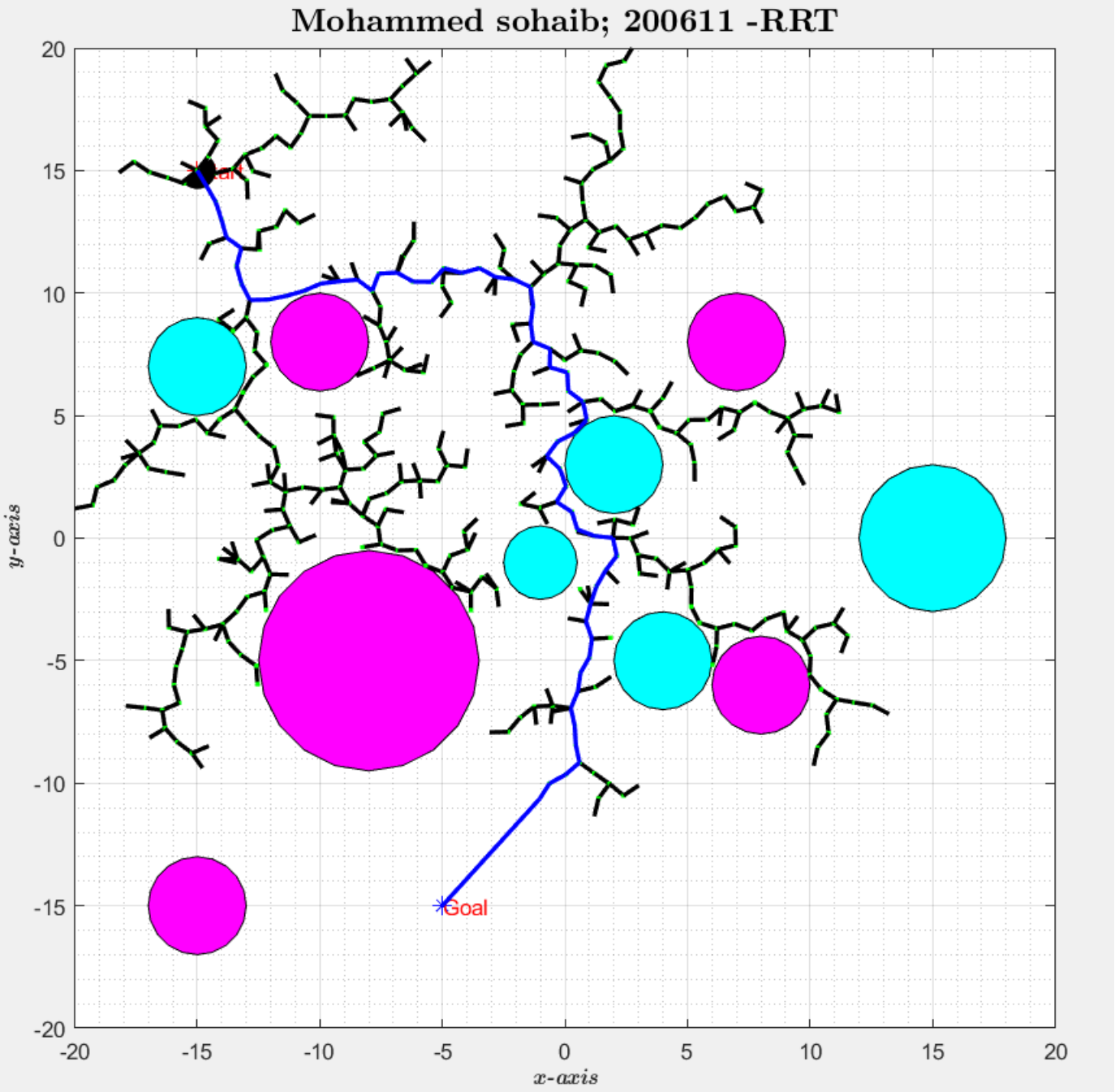
No of nodes: 1000.



START: [-15 -15]

END: [-5 -15]

NODES: 1500

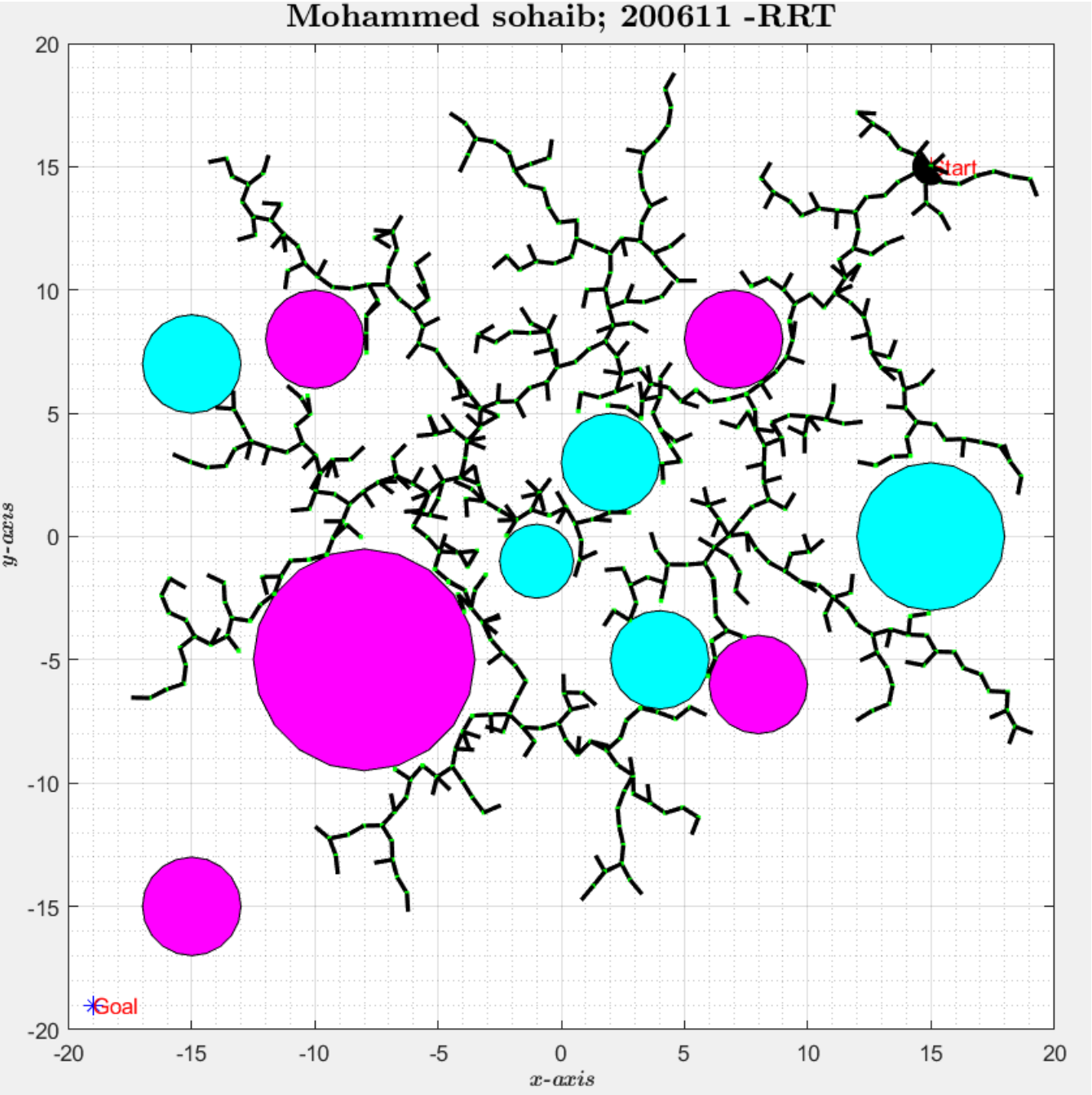


FAILED CASE:

START: [15 15]

END: [-19 -19]

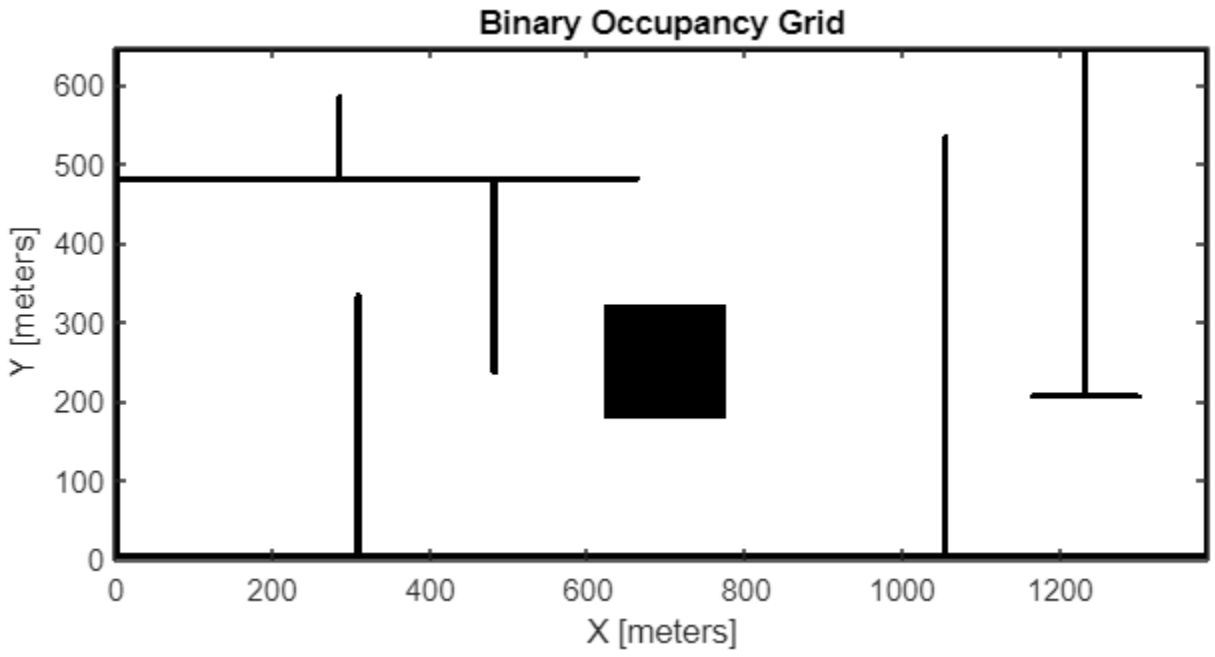
NODES: 1000

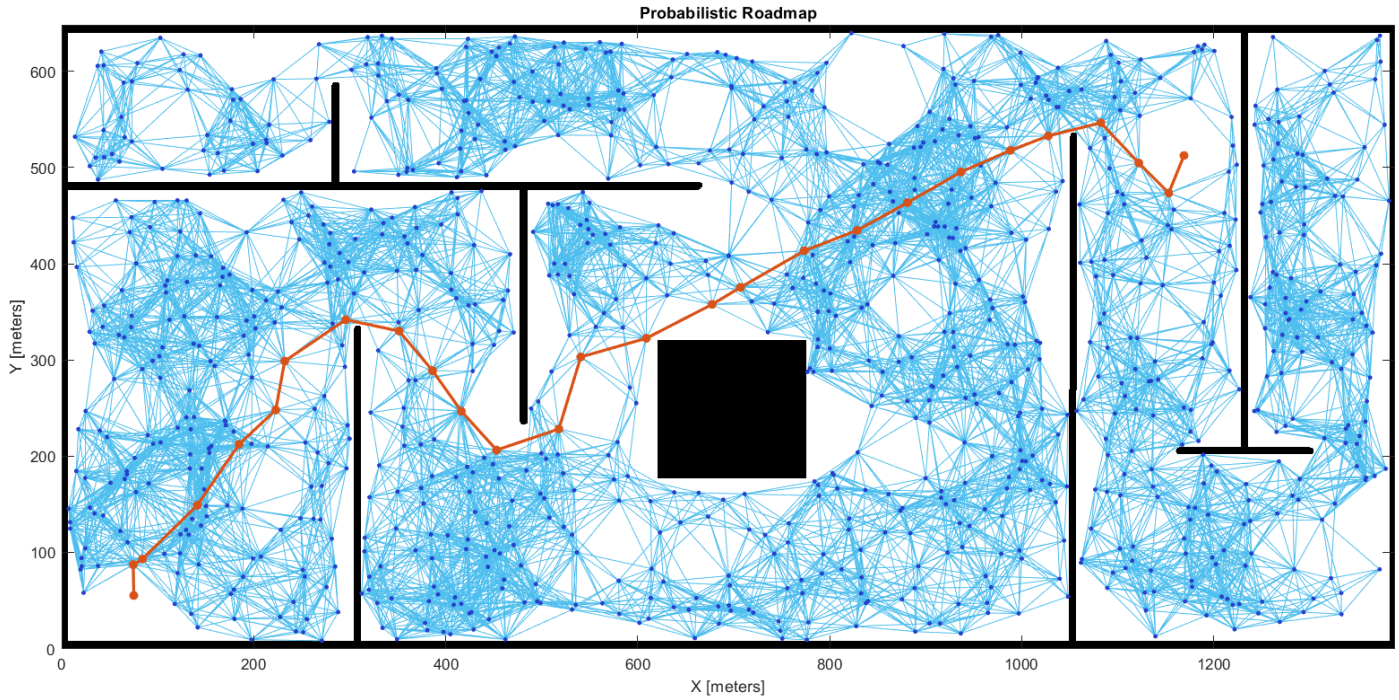


2) PROBABILISTIC ROAD MAP METHOD BY ROBOTICS TOOLBOX.

This is basically done by the inbuilt functions of the Probabilistic road map and draw out the possible paths.

Work space:





Considerable code is at the end of the document.