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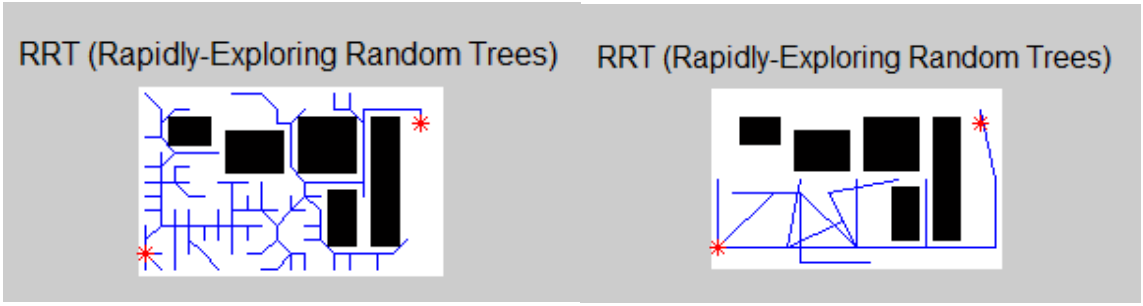
Robotics Assignment 1

RRT (Rapidly-Exploring Random Trees)

- In RRT we maintain two lists Edges and Vertices.
- Vertices contains
    - All valid nodes as we compute new vertex.
    - Vertices must lie in obstacle free space.
- Edges contains
    - Two vertices which constitutes the edge.
    - The edge must lie in obstacle free space.
- Implementation
    - Find a random point within the environment
    - Find a nearest vertex to that random point.
    - Find a new point at the delta distance away from nearest point in the direction of random point.
    - Check if the new point and edge attached to it lies in free space by breaking the edge in intermediate points and checking for each point alone.
    - Keep doing this until the cell with the target is not reached or the edge constitutes the target.



- Matlab Code Info:
    - creating_environment.m is used to create a matrix with obstacles.
    - rrt_run.m calls rrt_implement with variable delta and environment.
    - Left one is un-simplified path from source to goal with delta = 1.
    - Right one is un-simplified path from source to goal with delta = 5.