Project 2

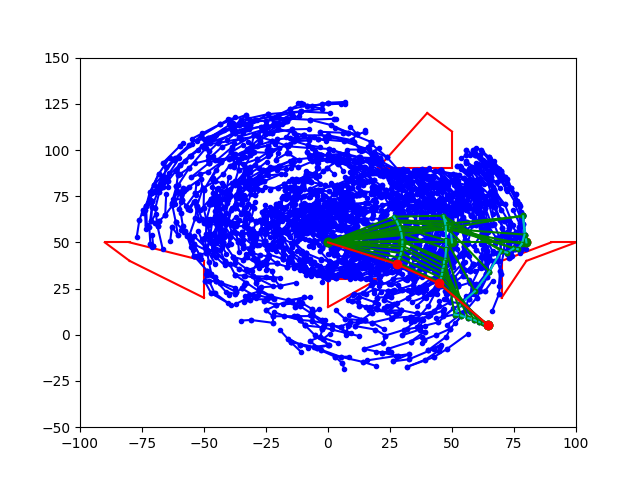
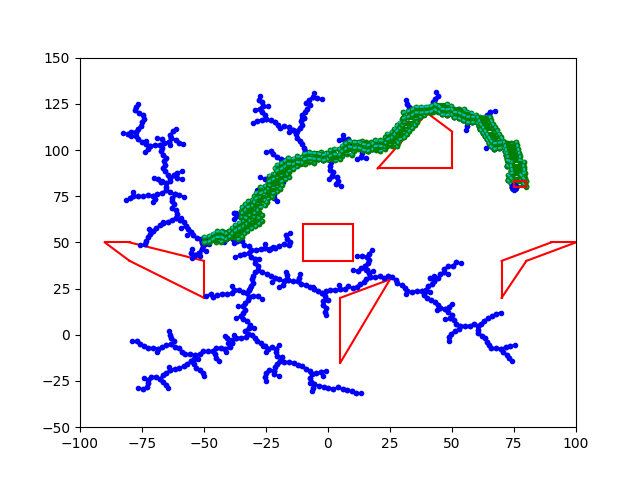
Will Graham

# **Rapidly-Exploring Random Trees**

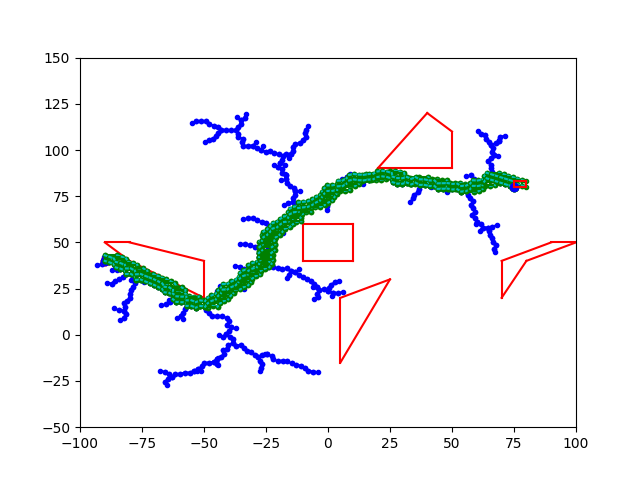
A picture containing text

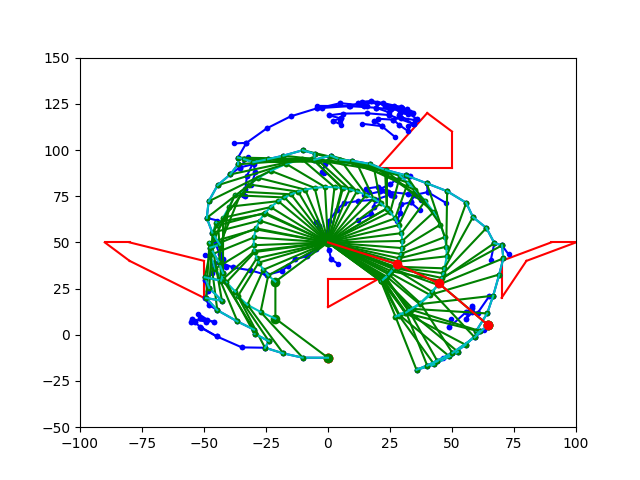
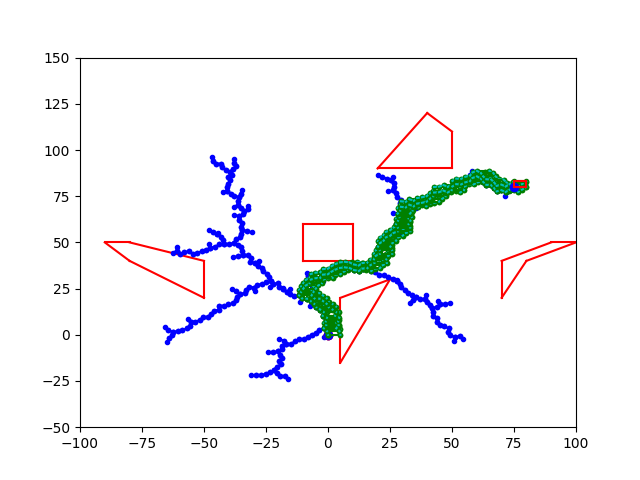
Description automatically generated

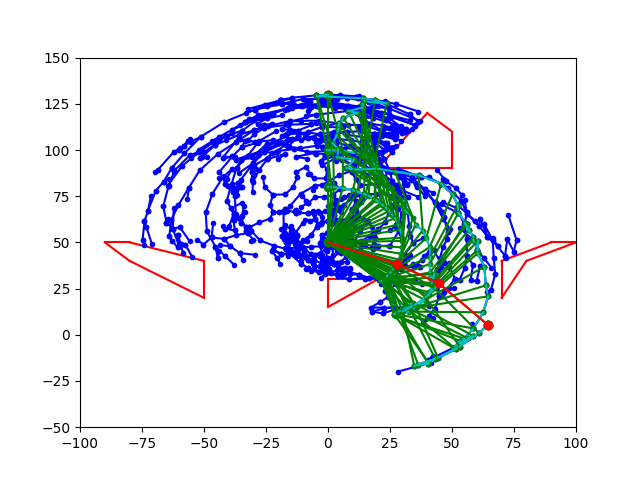
Env0 and Env 1 with 5% probability of sampling towards goal



Additional Configurations (run with same probability and step size, included in zip folder)

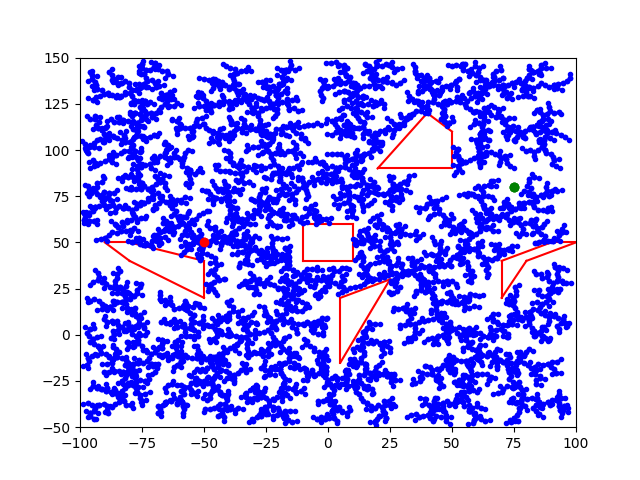
Chart

Description automatically generatedA picture containing diagram

Description automatically generated



Env0 with 0% probability of sampling towards goal step size of 0.2



Env 0 with 10% probability of sampling towards goal step size of 0.2

Chart

Description automatically generated­­

Env 0 with 50% probability of sampling towards goal step size of 0.2

Chart, line chart

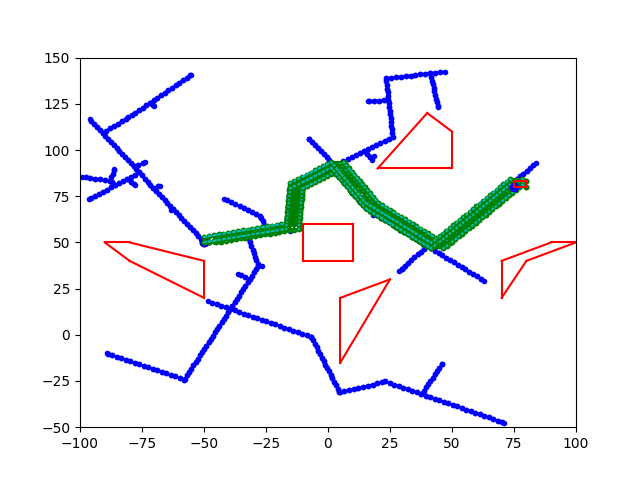
Description automatically generated

* The higher the percentage of sampling the goal, the more directed towards the goal. In our limited environment, this led to much quicker computing times. Unfortunately, this might also lead to our algorithm getting trapped in obstacles.

Text

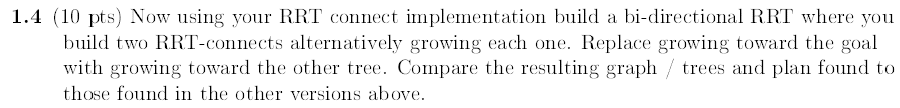
Description automatically generated

* Original environments

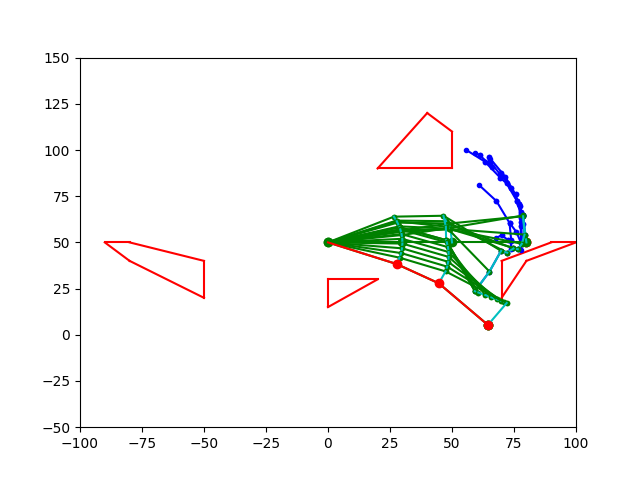
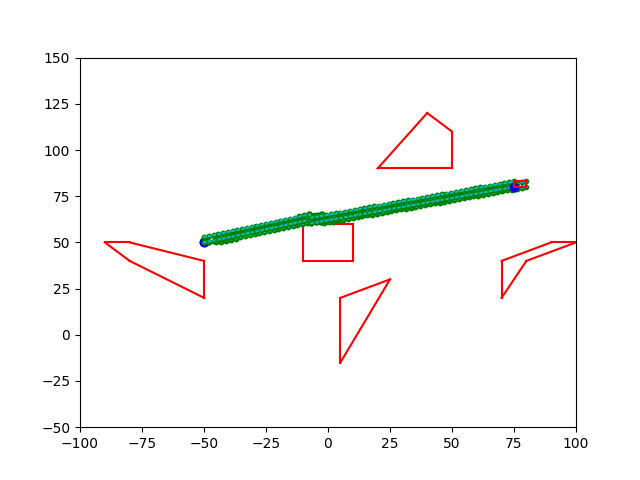
Chart

Description automatically generated

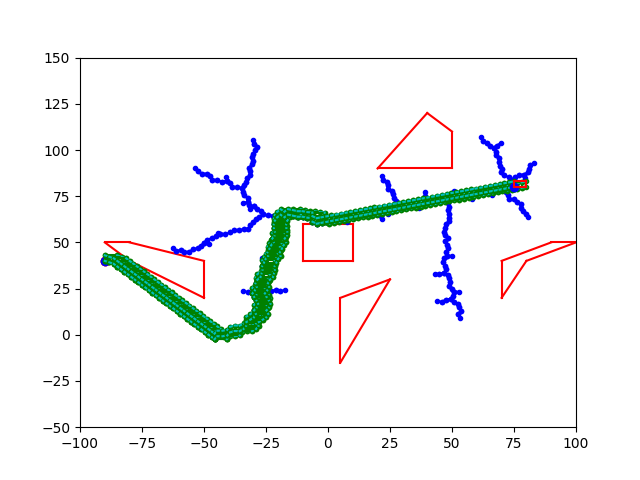
* Custom environments

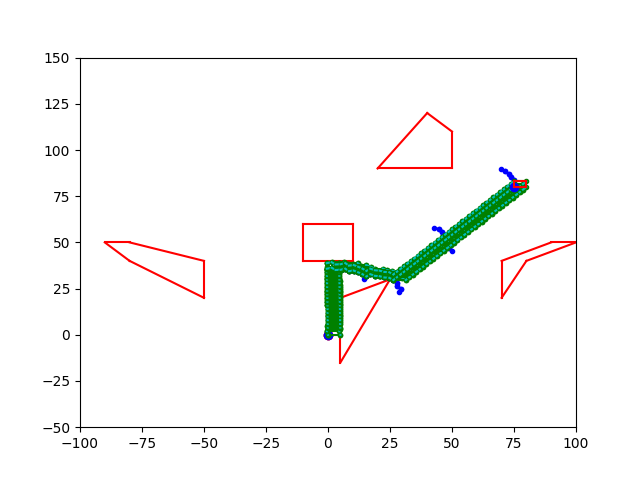


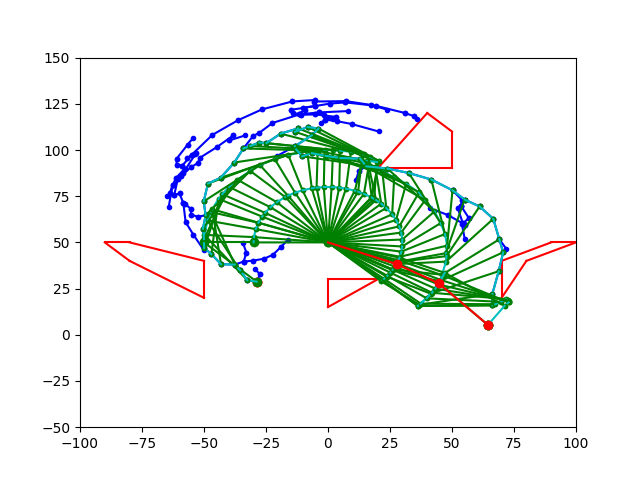
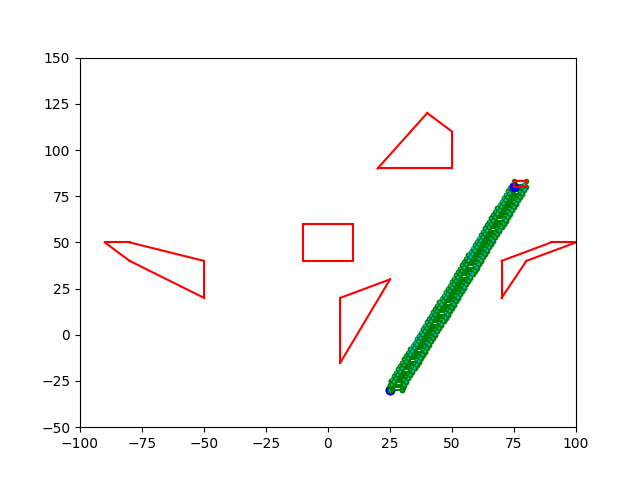
* Original Environments



* Custom environments

Chart

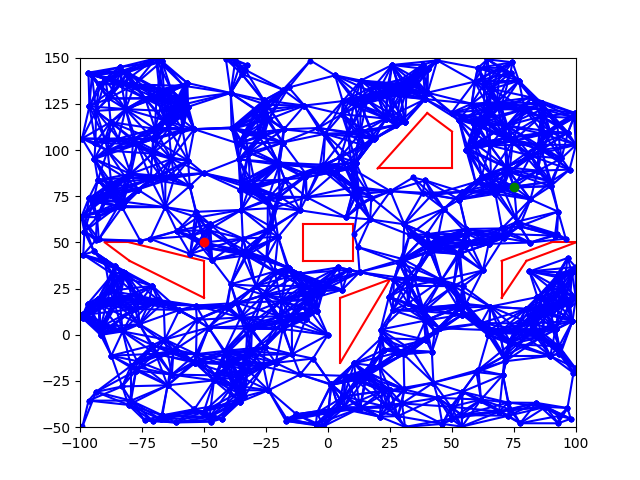
Description automatically generatedChart

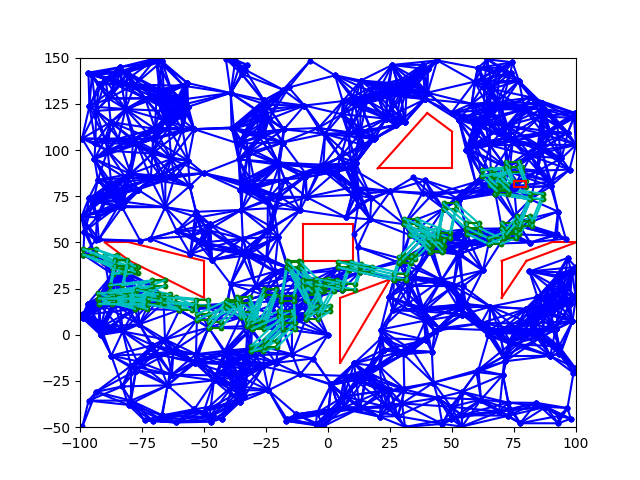
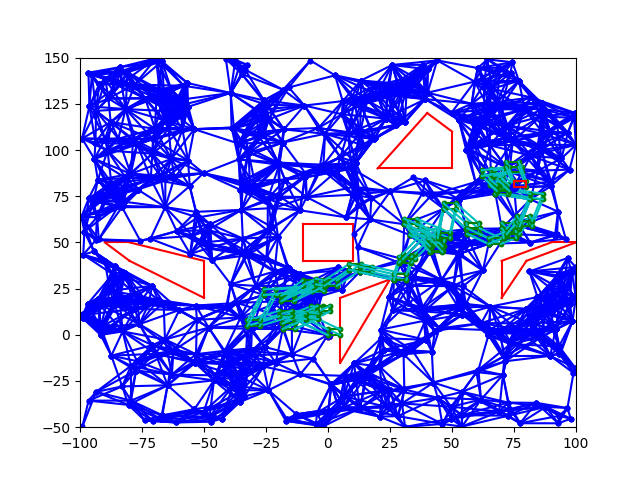
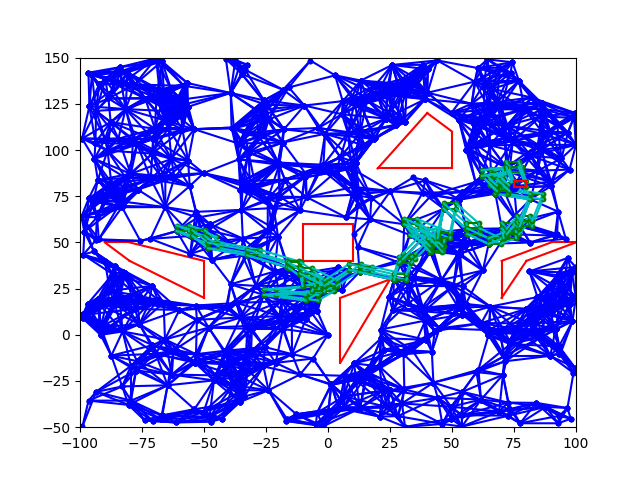
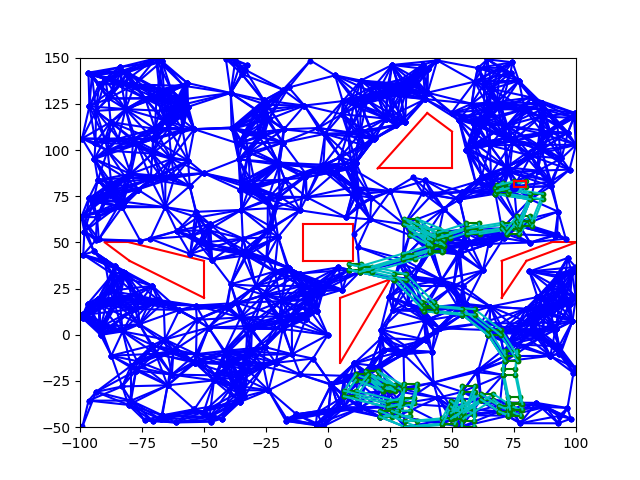
Description automatically generated

Text

Description automatically generated with low confidence

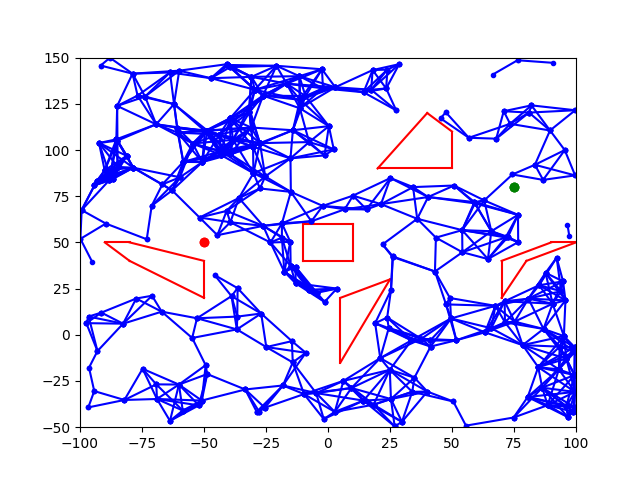
PRM on env0 with 500 samples, step size of 2 with radius of 25 and no plan shown



PRM on env0 with different starting points with same goal on same map

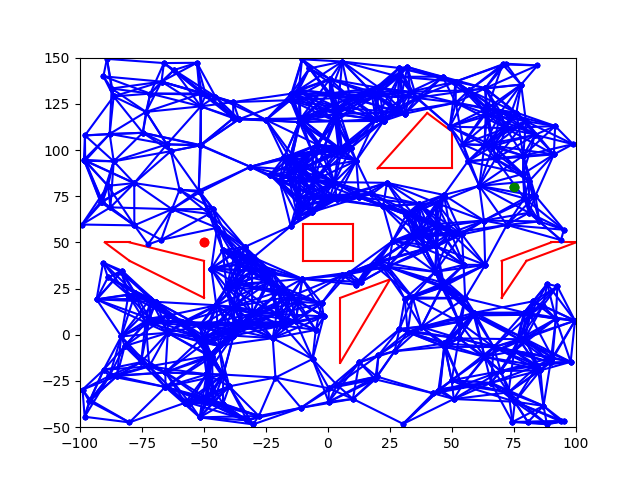
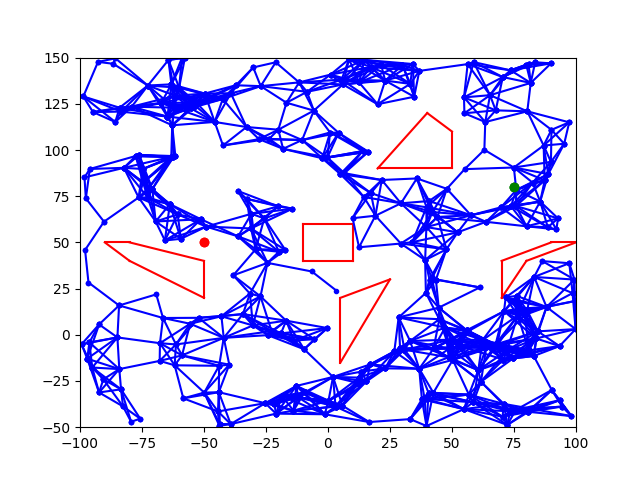
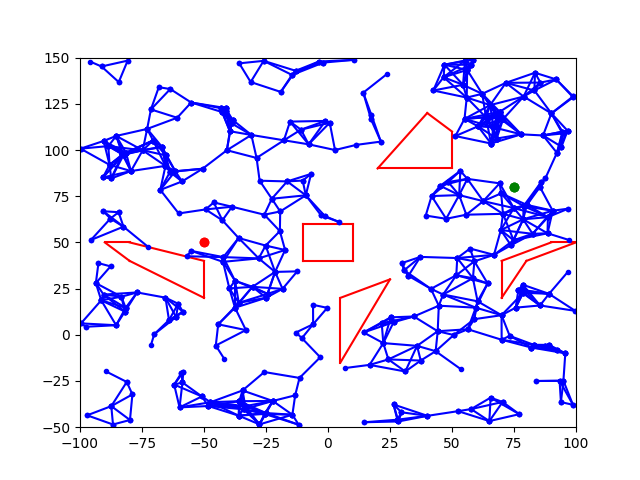
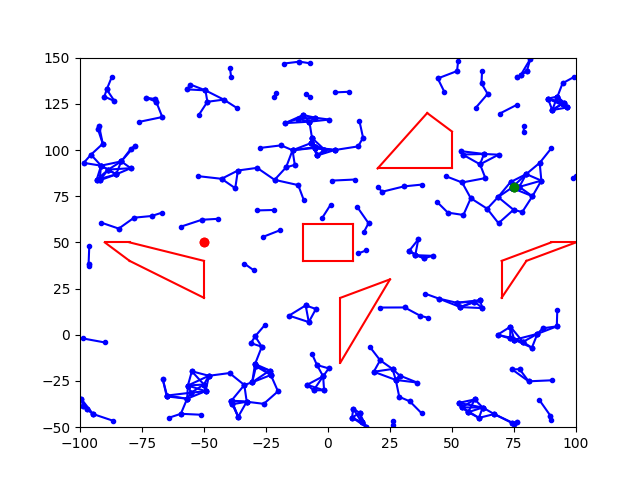
Different sample sizes (n = 100, n = 250, n = 500; all with step size 2, radius 25)

Diagram

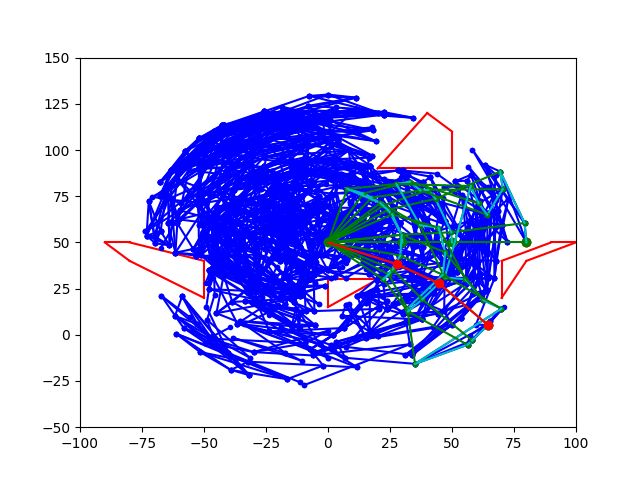
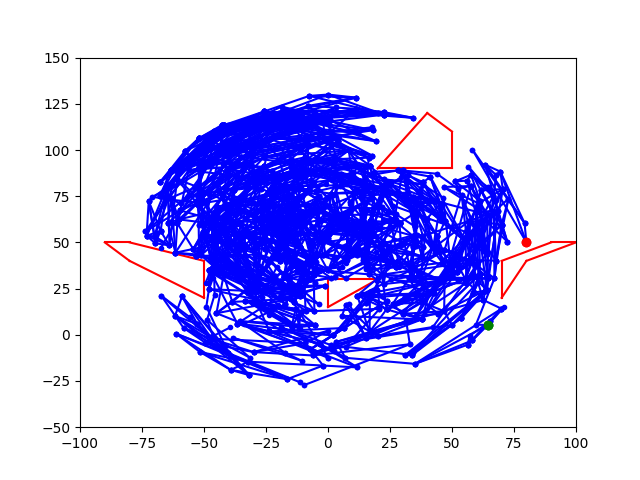
Description automatically generatedA picture containing graphical user interface

Description automatically generated

Different Radius Sizing (r = 10, 15, 20, 25, 30, with 300 samples)

A picture containing shape

Description automatically generated

PRM on env1 with 750 samples, step size of 0.01, radius of .75A picture containing chart

Description automatically generated