Homework 2
Christopher Seagraves

Problem 1

./Grid.py
https://github.com/nosv1/seagraves_unmanned_systems/blob/main/HW2/Grid.py

```python
1   class Grid:
2
3       ...
4
5       def node_in_obstacle(self, position: Node) -> bool:
6           """
7           Checks if a position is in an obstacle
8           :param position: position to check
9           :return: True if in obstacle, False otherwise
10          """
11          for obstacle in self.obstacles:
12              if position.distance(obstacle) <= self.bot_radius:
13                  return True
14          return False
15
16      def node_in_bounds(self, position: Node) -> bool:
17          """
18          Checks if a position is in the bounds of the grid
19          :param position: position to check
20          :return: True if in bounds, False otherwise
21          """
22          return (
23              0 + self.bot_radius <= position.x <= self.max_x - self.bot_radius and
24              0 + self.bot_radius <= position.y <= self.max_y - self.bot_radius
25          )
26
27      def node_is_valid(self, position: Node) -> bool:
28          """
29          Checks if a position is valid
30          :param position: position to check
31          :return: True if valid, False otherwise
32          """
33          return (
34              self.node_in_bounds(position) and
35              not self.node_in_obstacle(position)
36          )
```

Valid Positions (obstacles)
Grid Spacing: 0.5, Obstacle Radius: 0.5