In this assignment, we will consider the problem of finding the shortest path for a robot vacuum on an 8x8 grid. The detailed instructions are included in the *PA2\_instruction.pdf* file and python files that will guide you through the assignment.

The code for this assignment includes the following files:

* *PA2\_search.py*: you will edit this file which contains methods for A\* an UCS algorithms.
* *PA2\_test.py*: this file is used to visualize the results and test the A\* and UCS algorithms.
* **Files to Edit and Submit:** You will fill in portions of *PA2\_search.py* only during the assignment, and submit it. You should submit this file with your code and comments. Please *do not* change the other files in this distribution or submit any of our original files other than this file.

In *PA2\_search.py* file, there are ###### START OF YOUR CODE HERE/#### END OF YOUR CODE#### tags denoting the start and end of code sections you should fill out. Take care to not delete or modify these tags. Otherwise, your assignment may not be properly graded.

Complete *UCsearch()* and *aStarSearch()* functions in the PA2\_search.py file.

Although there are multiple solutions with *A\** and *UCS*, make sure that you achieve the same cost for these methods.

To test your implementation, run your code with: *python PA2\_test.py*

**Grading Policy:**

* Program crash: **0 points**. We also made an auto-grading program. If our program cannot run your implementation, you will not get any point, you will get 0 points. Therefore, please keep the name of functions, the input parameters, and the output.
* Plagiarism: **0 points**. Before we do the grading, we will check the code similarity to make sure that no one copies and pastes the code from others.
* Grading environment: **Python 3.7.4 on Windows 10**. You can use Anaconda with Jupyter to debug. However, if your code cannot run on the terminal in the grading environment, you will get **0 points**.
* Deadline: **10th September 2020, 23:59**