In this assignment, there are two python files:

* **as1\_bfs.py:** we have already implemented the basic BFS algorithm, which can work properly with the non-loopy path.
* **as1\_test.py:** you can use this file to test your implementation. In this file, we included two data structures that reflect the tree. These are also the trees that we will use to grade your implementation.

Tasks: two functions need to be implemented:

1. **def traverse(tree, init)**: BFS traversal function. This func accepts two inputs: the tree to traverse and the initial state. We already provided an example of how to run this func in the as1\_test.py. Your task is to modify it to run with the loopy path. So far, if you try to traverse the tree\_2 without a valid modification, your program crashes. (2 points)
2. **def pathfinder(tree, init, goal)**: still BFS traversal function. However, this func accepts three inputs: the tree, the initial state, and the goal state. Your task is to find the solution from the initial state to the goal state even we have the loopy path in the tree. (3 points)

**Grading Policy:**

* Rule of traversing: Alphabetical ordered first. If there are two nodes with the same name, the same cost, we will traverse from left to right. We put this policy to reduce the confusion (if any).
* 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**.
* Important: the output should be exactly in the **form of an array**. For example: **result=['1', '2', '3', '4', '5', '6', '7']**. There is a runnable example of the output in**as1\_test.py**. You might test the case by yourself.
* 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: **1st September 2020, 23:59**