**Artificial Intelligence – Assignment 3 Report**

**Corc from GWU**

**The Value iteration**

The value iteration in every loop compares every state’s value of 4 directions and get the max value as the state’s value. In the calculation of value, use (direction’s value \* gamma \* noise+ noise direction’s value \*gamma\* noise+…) as the function. When the direction points to the boundary, see the direction’s value as himself. Do this update value until all states value does not change, then we get the goal state.

**The policy iteration**

The policy iteration randomly selects a direction (I select upward) for all the states and update the values according to the direction until all values do not change. Then pick the better direction by using the max value’s direction of all 4 direction’s value. According this direction to calculate the value as every state’s value again just like before. Then when the value does not change, we try to pick the direction again. Do this find better direction and update value until all states are not change their direction, then we get the goal state.

**How to run the code?**

Use readFile() to read the grid, gamma, noise and the states.

use valueIteration() to get the states of value iteration.

Use policyIteration() to get the states of policy iteration.

**Time comparation:**

I1.txt with 7 grids and 3 noises gamma=0.9

Value iteration cost: 691100ns

Policy iteration cost: 1097600ns

I6.txt with 6 grids and 4 noises gamma=0.8

Value iteration cost: 718100ns

Policy iteration cost: 341800ns

I8.txt with 30 grids and 3 noises gamma=0.9

Value iteration cost: 20784100ns

Policy iteration cost: 29263100ns

**Some screenshots:**

