Project 2

A.

1.

It didn't perform well because it was sitting idly for a long time at corners while the ghosts are on the other side. This was probably due to since depth is 2, it only looks at closest actions. Since the distance of the ghosts and food/pallets are about the same, it just sit there until the ghosts come closer to force pacman to move

```
(cs360) C:\Users\Saitama\git\usc\cs360\project2-multiagent>python pacman.py -p MinimaxAgent -l smallClassic -a depth=2 -
n 10 --frameTime 0
Pacman died! Score: -226
Pacman emerges victorious! Score: 785
Pacman died! Score: -121
Pacman died! Score: -270
Pacman died! Score: -29
Pacman died! Score: -205
Pacman died! Score: -481
Pacman died! Score: -526
Pacman emerges victorious! Score: 764
Pacman died! Score: -293
Average Score: -60.2
Scores:        -226.0, 785.0, -121.0, -270.0, -29.0, -205.0, -481.0, -526.0, 764.0, -293.0
Win Rate:      2/10 (0.20)
Record:        Loss, Win, Loss, Loss, Loss, Loss, Loss, Loss, Win, Loss

(cs360) C:\Users\Saitama\git\usc\cs360\project2-multiagent>python pacman.py -p AlphaBetaAgent -l smallClassic -a depth=2
 -n 10 --frameTime 0
Pacman died! Score: -252
Pacman emerges victorious! Score: 1351
Pacman died! Score: -390
Pacman died! Score: -241
Pacman died! Score: -285
Pacman died! Score: -110
Pacman died! Score: -276
Pacman died! Score: -343
Pacman died! Score: -17
Pacman died! Score: -181
Average Score: -74.4
Scores:        -252.0, 1351.0, -390.0, -241.0, -285.0, -110.0, -276.0, -343.0, -17.0, -181.0
Win Rate:      1/10 (0.10)
Record:        Loss, Win, Loss, Loss, Loss, Loss, Loss, Loss, Loss, Loss

(cs360) C:\Users\Saitama\git\usc\cs360\project2-multiagent>python pacman.py -p ExpectimaxAgent -l smallClassic -a depth=
2 -n 10 --frameTime 0
Pacman died! Score: -116
Pacman died! Score: -113
Pacman died! Score: 82
Pacman died! Score: -181
Pacman emerges victorious! Score: 966
Pacman died! Score: -314
Pacman died! Score: -352
Pacman died! Score: -195
Pacman died! Score: -274
Pacman died! Score: -516
Average Score: -101.3
Scores:        -116.0, -113.0, 82.0, -181.0, 966.0, -314.0, -352.0, -195.0, -274.0, -516.0
Win Rate:      1/10 (0.10)
Record:        Loss, Loss, Loss, Loss, Win, Loss, Loss, Loss, Loss, Loss

(cs360) C:\Users\Saitama\git\usc\cs360\project2-multiagent>
```

2.

I prioritized looking for the food and ghost's distance from pacman. If the ghost is too close (< 2), returns a large negative value to make pacman avoid ghost. If food is very close (< 1), returns a large positive value to make pacman move to the food. At the end, it returns sum of current score, ghost distance, and food distance. They're inversed for more precise value.
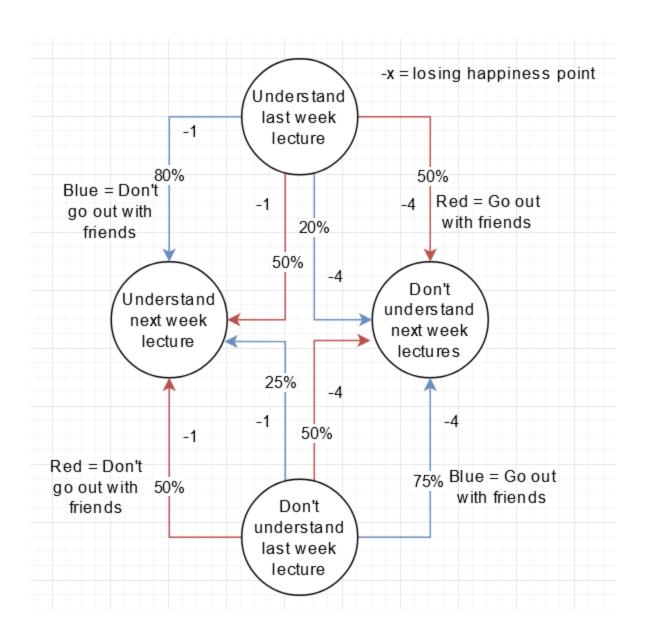
```
Question q4
===========

Pacman emerges victorious! Score: 891
Pacman emerges victorious! Score: 937
Pacman emerges victorious! Score: 773
Pacman emerges victorious! Score: 917
Pacman emerges victorious! Score: 911
Pacman emerges victorious! Score: 826
Pacman emerges victorious! Score: 946
Pacman died! Score: -163
Pacman emerges victorious! Score: 966
Pacman died! Score: -67
Average Score: 693.7
Scores:        891.0, 937.0, 773.0, 917.0, 911.0, 826.0, 946.0, -163.0, 966.0, -67.0
Win Rate:      8/10 (0.80)
Record:        Win, Win, Win, Win, Win, Win, Win, Loss, Win, Loss
*** FAIL: test_cases\q4\grade-agent.test (4 of 6 points)
***     693.7 average score (1 of 2 points)
***         Grading scheme:
***          < 500:  0 points
***         >= 500:  1 points
***         >= 1000:  2 points
***     10 games not timed out (1 of 1 points)
***         Grading scheme:
***          < 0:   fail
***         >= 0:   0 points
***         >= 10:  1 points
***     8 wins (2 of 3 points)
***         Grading scheme:
***          < 1:   fail
***         >= 1:   1 points
***         >= 5:   2 points
***         >= 10:  3 points

### Question q4: 4/6 ###


Finished at 23:07:21

Provisional grades
==================
Question q1: 5/5
Question q2: 5/5
Question q3: 5/5
Question q4: 4/6
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Total: 19/21

Token for submission has been created! Submit submit.token, multiagent.py, and report.pdf to Blackboard.

Your grades are NOT yet registered.  To register your grades, make sure
to follow your instructor's guidelines to receive credit on your project.
```

B.

1.