

1.

```

%%%%%%%%%
% .      ..      % .. G  %
%. G.    %% ...   .  %.    .. %
% .      %%      %%%%.   %
%. .    %%%%.   .    .      %
%      ...      ....   %
% .    %%%%.   %%%%.   %
%      %      . G      %      G %
%P .    %      .    .. %      %
%%%%%%%%%

```

```

C:\Users\user\Desktop\multiagent>python2 pacman.py -p ExpectimaxAgent -g Minimax
Ghost -a depth=1 -n 1 -l New
Pacman died! Score: -588
Average Score: -588.0
Scores:      -588.0
Win Rate:    0/1 (0.00)
Record:      Loss

```

2.

	Adversarial Ghost	Random Ghost
Minimax Pacman	Won 1/5 Avg. Score:-83.8	Won 0/5 Avg. Score:-255.2
Expectimax Pacman	Won 0/5 Avg. Score:-198.6	Won 0/5 Avg. Score:-265.2

(1)Adversarial Ghost and Minimax Pacman

```

C:\Users\user\Desktop\multiagent>python2 pacman.py -p MinimaxAgent -g MinimaxGho
st -a depth=1 -n 5 -l smallClassic
Pacman died! Score: -448
Pacman died! Score: -284
Pacman emerges victorious! Score: 874
Pacman died! Score: -332
Pacman died! Score: -229
Average Score: -83.8
Scores:      -448.0, -284.0, 874.0, -332.0, -229.0
Win Rate:    1/5 (0.20)
Record:      Loss, Loss, Win, Loss, Loss

```

(2)Adversarial Ghost and Expectimax Pacman

```

C:\Users\user\Desktop\multiagent>python2 pacman.py -p ExpectimaxAgent -g Minimax
Ghost -a depth=1 -n 5 -l smallClassic
Pacman died! Score: 193
Pacman died! Score: -779
Pacman died! Score: -149
Pacman died! Score: 129
Pacman died! Score: -387
Average Score: -198.6
Scores:      193.0, -779.0, -149.0, 129.0, -387.0
Win Rate:    0/5 (0.00)
Record:      Loss, Loss, Loss, Loss, Loss

```

### (3) Random Ghost and Expectimax Pacman

```
C:\Users\user\Desktop\multiagent>python2 pacman.py -p ExpectimaxAgent -g RandomGhost -a depth=1 -n 5 -l smallClassic
Pacman died! Score: -7
Pacman died! Score: -203
Pacman died! Score: -334
Pacman died! Score: -343
Pacman died! Score: -389
Average Score: -255.2
Scores:      -7.0, -203.0, -334.0, -343.0, -389.0
Win Rate:    0/5 <0.00>
Record:      Loss, Loss, Loss, Loss, Loss
```

### (4) Random Ghost and Minimax Pacman

```
C:\Users\user\Desktop\multiagent>python2 pacman.py -p MinimaxAgent -g RandomGhost -a depth=1 -n 5 -l smallClassic
Pacman died! Score: -249
Pacman died! Score: -154
Pacman died! Score: -165
Pacman died! Score: -383
Pacman died! Score: -375
Average Score: -265.2
Scores:      -249.0, -154.0, -165.0, -383.0, -375.0
Win Rate:    0/5 <0.00>
Record:      Loss, Loss, Loss, Loss, Loss
```

3. Adversarial Ghost and Minimax Pacman's combination wins the highest score.

Adversarial Ghost and Expectimax Pacman's combination ranks second.

Random Ghost and Minimax Pacman's combination ranks the third.

Random Ghost and Expectimax Pacman's combination ranks the last.

Then Minimax Pacman behaves the best. Especially when facing with the Adversarial Ghost.

Probably Minimax Pacman's reaction is better when meeting strong enemy.

4. For they are facing with the same enemy, and enemy's enemy could be the other's friend.

And also they are both chasing after the Pacman, and so there're 3/4 situation when pacman was being chased.

One: Ghost A chasing, Ghost B not chasing

Two: Ghost A not chasing, Ghost B chasing

Three: Ghost A chasing, Ghost B chasing

Four: Ghost A not chasing, Ghost B not chasing