

Results:

```
C:\Users\Abigile\Desktop\senior\AIB\Assignment3\prac4_Pacman>python2 pacman.py -l smallClassic -g MinimaxGhost -p MinimaxAgent -q -n 5
Pacman died! Score: -115
Pacman died! Score: -549
Pacman died! Score: 55
Pacman died! Score: -295
Pacman died! Score: -503
Average Score: -281.4
Scores: -115.0, -549.0, 55.0, -295.0, -503.0
Win Rate: 0/5 (0.00)
Record: Loss, Loss, Loss, Loss, Loss
```

```
C:\Users\Abigile\Desktop\senior\AIB\Assignment3\prac4_Pacman>python2 pacman.py -l smallClassic -g RandomGhost -p MinimaxAgent -q -n 5
Pacman died! Score: 14
Pacman died! Score: -126
Pacman died! Score: -30
Pacman died! Score: -361
Pacman died! Score: -380
Average Score: -176.6
Scores: 14.0, -126.0, -30.0, -361.0, -380.0
Win Rate: 0/5 (0.00)
Record: Loss, Loss, Loss, Loss, Loss
```

```
C:\Users\Abigile\Desktop\senior\AIB\Assignment3\prac4_Pacman>python2 pacman.py -l smallClassic -g RandomGhost -p ExpectimaxAgent -q -n 5
Pacman emerges victorious! Score: 1045
Pacman died! Score: -31
Pacman died! Score: 145
Pacman died! Score: -169
Pacman died! Score: 109
Average Score: 219.8
Scores: 1045.0, -31.0, 145.0, -169.0, 109.0
Win Rate: 1/5 (0.20)
Record: Win, Loss, Loss, Loss, Loss
```

```
C:\Users\Abigile\Desktop\senior\AIB\Assignment3\prac4_Pacman>python2 pacman.py -l smallClassic -g MinimaxGhost -p ExpectimaxAgent -q -n 5
Pacman emerges victorious! Score: 788
Pacman died! Score: -655
Pacman died! Score: -200
Pacman died! Score: 0
Pacman died! Score: 293
Average Score: 45.2
Scores: 788.0, -655.0, -200.0, 0.0, 293.0
Win Rate: 1/5 (0.20)
Record: Win, Loss, Loss, Loss, Loss
```

	Random Ghost	Minimax Ghost
Minimax Pacman	-176.6, won 0/5	-281.4 won 0/5
Expectimax Pacman	219 won 1/5	45.2 won 1/5

3. In all cases, the Pacman agent implementing the correct assumption of the ghosts' behavior. As the result shows, the average scores of minimax ghost are smaller than random ghosts, which means our ghosts are smarter so that the pacman got lower scores.

4. Because they use the same algorithm, if there are many ghosts, they go through different roads, but they have the same goal which is eating pacman. Hence, they seem as if they are cooperating.