

3.

```
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p MinimaxAgent -l testClassic -g RandomGhost -a depth=4
Pacman emerges victorious! Score: 562
Average Score: 562.0
Scores: 562.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p MinimaxAgent -l testClassic -g RandomGhost -a depth=4
Pacman emerges victorious! Score: 550
Average Score: 550.0
Scores: 550.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p MinimaxAgent -l testClassic -g RandomGhost -a depth=4
Pacman emerges victorious! Score: 456
Average Score: 456.0
Scores: 456.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p MinimaxAgent -l testClassic -g RandomGhost -a depth=4
Pacman emerges victorious! Score: 534
Average Score: 534.0
Scores: 534.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p MinimaxAgent -l testClassic -g RandomGhost -a depth=4
Pacman emerges victorious! Score: 556
Average Score: 556.0
Scores: 556.0
Win Rate: 1/1 (1.00)
Record: Win
```

Fig.1 Minimax Pacman vs. Random Ghost (testClassic.lay)

```
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p ExpectimaxAgent -l testClassic -g RandomGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p ExpectimaxAgent -l testClassic -g RandomGhost -a depth=4
Pacman emerges victorious! Score: 562
Average Score: 562.0
Scores: 562.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p ExpectimaxAgent -l testClassic -g RandomGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p ExpectimaxAgent -l testClassic -g RandomGhost -a depth=4
Pacman emerges victorious! Score: 560
Average Score: 560.0
Scores: 560.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p ExpectimaxAgent -l testClassic -g RandomGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
```

Fig.2 Expectimax Pacman vs. Random Ghost (testClassic.lay)

```
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p ExpectimaxAgent -l testClassic -g MinimaxGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p ExpectimaxAgent -l testClassic -g MinimaxGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p ExpectimaxAgent -l testClassic -g MinimaxGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p ExpectimaxAgent -l testClassic -g MinimaxGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p ExpectimaxAgent -l testClassic -g MinimaxGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
```

Fig.3 Expectimax Pacman vs. Minimax Ghost (testClassic.lay)

```

[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p MinimaxAgent -l testClassic -g MinimaxGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p MinimaxAgent -l testClassic -g MinimaxGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p MinimaxAgent -l testClassic -g MinimaxGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p MinimaxAgent -l testClassic -g MinimaxGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win
[PENGdeMacBook-Pro:prac4_Pacman_test pengxiaoru$ python pacman.py -p MinimaxAgent -l testClassic -g MinimaxGhost -a depth=4
Pacman emerges victorious! Score: 564
Average Score: 564.0
Scores: 564.0
Win Rate: 1/1 (1.00)
Record: Win

```

Fig.4 Minimax Pacman vs. Minimax Ghost (testClassic.lay)

	Minimax Ghost	Random Ghost
Minimax Pacman	5/5 (Average 564)	5/5 (Average 532)
Expectimax Pacman	5/5 (Average 564)	5/5 (Average 563)

(1) Minimax Pacman & Minimax Ghost: They are contending against each other.

(2) Minimax Pacman & Random Ghost: Pacman wins. Minimax pacman is smarter and can try to avoid the

ghost while getting the pallet.

(3) Expectimax Pacman & Minimax Ghost: They are contending against each other.

(4) Expectimax Pacman & Random Ghost: Pacman wins. Ghosts are moving randomly while pacman moves quite directly to the pallet while avoiding the ghosts.

4. They share the same information of the situation and same evaluation system while working towards the same goal.