Artificial Intelligence Assignment #2

(2021-11-27 updated)

Due Date

- 2021-12-17 (Friday) 11:59pm

Programming Details

- Python 3
- There is no external library required for this assignment
- Possible to use any IDE (SublimeText, VS Code, Vim, …)

Grading Policy

- Win 0~4 levels = 100% (20% for each level)
- I will run your code 10 times and count that case as winning if (# of wins) >= 8
- Otherwise, you can set a seed to your main.py file and submit it.

Assignment Details

- Write an **Q-learning** agent to play **Pacman**
- **Ghost** : It follows the user if the user is nearby, otherwise move randomly
- **User** : It moves by your policy
- **Item** : User get a point when eat an item on the board
- **Score** :
  - Each move : -1
  - Eat item : +10
  - Win : +500
  - Lose : -500
- To win, you should eat every item (include power) before catched by ghosts
- If you catched by ghosts or make too many move, you will lose
- Your program should finish 100 training in **2 min**

Need to Do

- Modify a **next_pos_v3** function in **user.py** file to win all levels
- It is allowed to add any new class or function, but the **next_pos_v3** function is required
- Skeleton code of **Q-learning (v2)** and **Approximate Q-learning (v3)** are given
- You are not allowed to modify the other files

How to Test Your Code

- Change the **move=v2** and **level** in **main.py** file to test user policy
- It will train 1000 episodes and gives an step-by-step test episode
- There are 5 levels (0 ~ 4)

Need to Include

- Zip of your code. (**user.py** in **student_id.zip**)
- Please include only **user.py** file (do not make additional files)

Submission

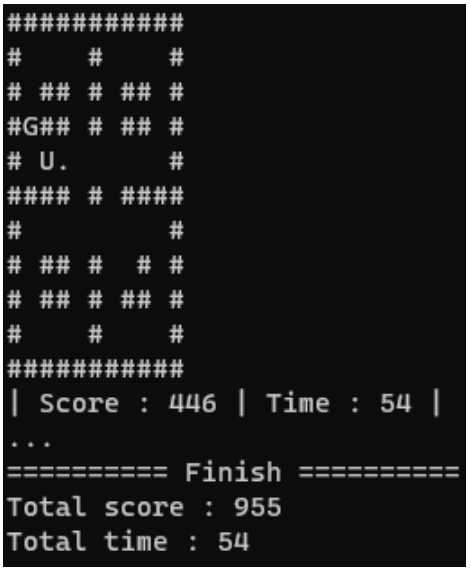
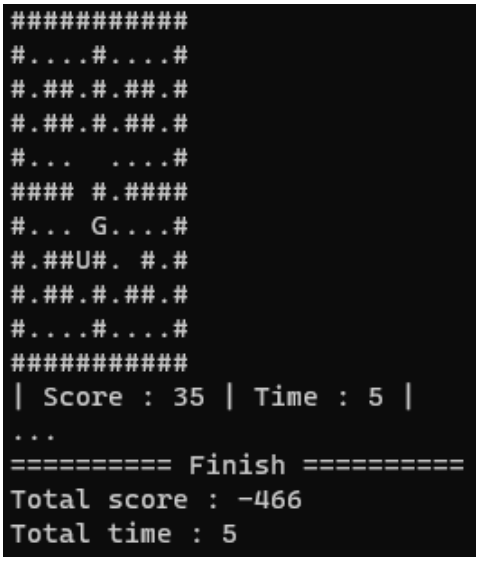
- Submit your file in ETL → Assignment 2
- Zip your **user.py** into **student_id.zip** (ex: **2021-12345.zip**)

Late Submission Penalty

- Late submission is allowed, but there is a 20% point deduction per day up to a maximum of four days.

Download

- Python 3 : https://www.python.org/downloads/
- Alternatively, you can use **Anaconda** to install python. https://www.anaconda.com/products/individual-d#Downloads

	
Win	**Lose**