# mlbd2022fall-small-grid-world

2022机器学习与大数据作业9, code here: https://github.com/keyork/mlbd2022fall-small-grid-world

#### **Envs**

```
python==3.7.13
numpy==1.21.6
colorlog==6.7.0
```

### **Usage**

```
git clone git@github.com:keyork/mlbd2022fall-small-grid-world.git
   cd mlbd2022fall-small-grid-world
   python run.py --ws 4 --am 0.25 0.25 0.25 0.25
4
5
   usage: run.py [-h] [--ws WS] [--am AM [AM ...]]
6
7
   optional arguments:
8
     -h, --help
                     show this help message and exit
9
      --ws WS
                      world size
10
      --am AM [AM ...] agent mind, [left, right, up, down]
```

#### Result

```
Set agent mind = [p_{left}, p_{right}, p_{up}, p_{down}]
```

- agent mind = [0.25, 0.25, 0.25, 0.25]
  - o iter times: 107
  - Result:

```
1 [[ 0. -13.96 -19.94 -21.94]
2 [-13.96 -17.95 -19.94 -19.94]
3 [-19.94 -19.94 -17.95 -13.96]
4 [-21.94 -19.94 -13.96 0. ]]
```

- agent mind = [0.1, 0.5, 0.2, 0.2]
  - o iter times: 148
  - Result:

```
1 [[ 0. -26.06 -29.8 -30.22]
2 [-19.17 -24.73 -25.61 -25.45]
3 [-19.45 -19. -17.25 -15.62]
4 [-15.86 -12.42 -7.11 0. ]]
```

- agent mind = [0.9, 0.01, 0.05, 0.04]
  - o iter times: 462
  - Result:

```
1 [[ 0. -3.17 -6.22 -9.12]
2 [ -48.6 -48.77 -49.07 -49.32]
3 [ -84.43 -84.44 -84.38 -80.21]
4 [ -104.33 -104.32 -103.24 0. ]]
```

### **Change World Size**

Set agent mind =  $[p_{left}, p_{right}, p_{up}, p_{down}]$  = [0.25, 0.25, 0.25, 0.25]

- world size = 3
  - o iter times: 43
  - Result:

```
1 [[ 0. -6.98 -8.98]
2 [-6.98 -7.98 -6.98]
3 [-8.98 -6.98 0. ]]
```

- world size = 5
  - o iter times: 213
  - o Result:

```
1 [[ 0. -22.95 -34.25 -39.57 -41.56]

2 [-22.95 -30.6 -36.25 -38.91 -39.57]

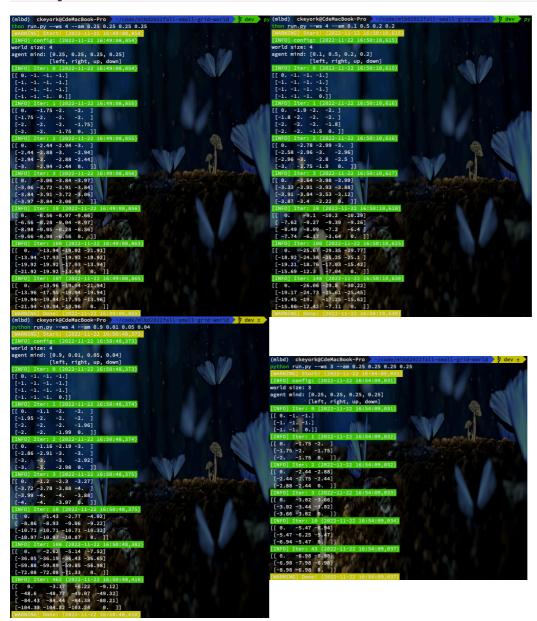
3 [-34.26 -36.25 -37.25 -36.25 -34.25]

4 [-39.57 -38.91 -36.25 -30.6 -22.95]

5 [-41.56 -39.57 -34.25 -22.95 0. ]]
```

- world size = 9
  - o iter times: 1049
  - o Result:

## **Output in Terminal**



If you input error <code>agent mind</code>, the program will report an error like this:

```
(mlbd) ckeyork@CdeMacBook-Pro /code/mlbd2022fall-small-grid-world // dev ± python run.py --ws 4 --am 0.9 0.9 0.9 0.9 [WARNING] Start! (2022-11-22 16:53:08,984) [INFO] config: (2022-11-22 16:53:08,984) world size: 4 agent mind: [0.9, 0.9, 0.9, 0.9] [Left, right, up, down] [ERROR] The sum of agent mind MUST be 1 but got [0.9, 0.9, 0.9, 0.9], EXIT! (2022-11-22 16:53:08,985)
```