

### Lesson Overview:

In this lesson, we are going to explain Overall structure value based Deep RL, Policy

### In class exercise:

1. Program a new simple version game for CartPole without considering DQN
2. Try the same code with another game like MountainCar-v0 (how the scores change? You should be able to analysis the score)

The following images represent the results.

### CartPoleDQN

```
episode: 4975/5000, score: 499, e: 0.0099
episode: 4976/5000, score: 254, e: 0.0099
episode: 4977/5000, score: 131, e: 0.0099
episode: 4978/5000, score: 28, e: 0.0099
episode: 4979/5000, score: 192, e: 0.0099
episode: 4980/5000, score: 79, e: 0.0099
episode: 4981/5000, score: 144, e: 0.0099
episode: 4982/5000, score: 499, e: 0.0099
episode: 4983/5000, score: 136, e: 0.0099
episode: 4984/5000, score: 184, e: 0.0099
episode: 4985/5000, score: 154, e: 0.0099
episode: 4986/5000, score: 61, e: 0.0099
episode: 4987/5000, score: 186, e: 0.0099
episode: 4988/5000, score: 120, e: 0.0099
episode: 4989/5000, score: 121, e: 0.0099
episode: 4990/5000, score: 206, e: 0.0099
episode: 4991/5000, score: 139, e: 0.0099
episode: 4992/5000, score: 128, e: 0.0099
episode: 4993/5000, score: 185, e: 0.0099
episode: 4994/5000, score: 138, e: 0.0099
episode: 4995/5000, score: 74, e: 0.0099
episode: 4996/5000, score: 26, e: 0.0099
episode: 4997/5000, score: 79, e: 0.0099
episode: 4998/5000, score: 95, e: 0.0099
episode: 4999/5000, score: 12, e: 0.0099
```

## CartPoleNoDQN

```
episode: 4975/5000, score: 16, e: 1.0
episode: 4976/5000, score: 33, e: 1.0
episode: 4977/5000, score: 19, e: 1.0
episode: 4978/5000, score: 14, e: 1.0
episode: 4979/5000, score: 69, e: 1.0
episode: 4980/5000, score: 30, e: 1.0
episode: 4981/5000, score: 25, e: 1.0
episode: 4982/5000, score: 37, e: 1.0
episode: 4983/5000, score: 20, e: 1.0
episode: 4984/5000, score: 20, e: 1.0
episode: 4985/5000, score: 19, e: 1.0
episode: 4986/5000, score: 15, e: 1.0
episode: 4987/5000, score: 18, e: 1.0
episode: 4988/5000, score: 26, e: 1.0
episode: 4989/5000, score: 8, e: 1.0
episode: 4990/5000, score: 10, e: 1.0
episode: 4991/5000, score: 9, e: 1.0
episode: 4992/5000, score: 30, e: 1.0
episode: 4993/5000, score: 15, e: 1.0
episode: 4994/5000, score: 25, e: 1.0
episode: 4995/5000, score: 13, e: 1.0
episode: 4996/5000, score: 10, e: 1.0
episode: 4997/5000, score: 16, e: 1.0
episode: 4998/5000, score: 13, e: 1.0
episode: 4999/5000, score: 35, e: 1.0
```

## MountainCar1

```
WARNING: Gym spaces.Box automatically casts
Failed to complete in trial 0
Failed to complete in trial 1
Failed to complete in trial 2
Failed to complete in trial 3
Failed to complete in trial 4
Failed to complete in trial 5
Failed to complete in trial 6
Failed to complete in trial 7
Failed to complete in trial 8
Failed to complete in trial 9
Failed to complete in trial 10
Failed to complete in trial 11
Failed to complete in trial 12
Failed to complete in trial 13
Failed to complete in trial 14
Failed to complete in trial 15
Failed to complete in trial 16
Failed to complete in trial 17
Failed to complete in trial 18
Failed to complete in trial 19
Failed to complete in trial 20
Failed to complete in trial 21
Failed to complete in trial 22
Failed to complete in trial 23
Failed to complete in trial 24
Failed to complete in trial 25
```

## MountainCar2

```
Failed to complete in trial 26
Failed to complete in trial 27
Failed to complete in trial 28
Failed to complete in trial 29
Failed to complete in trial 30
Failed to complete in trial 31
Failed to complete in trial 32
Failed to complete in trial 33
Failed to complete in trial 34
Failed to complete in trial 35
Failed to complete in trial 36
Failed to complete in trial 37
Failed to complete in trial 38
Failed to complete in trial 39
Failed to complete in trial 40
Failed to complete in trial 41
Failed to complete in trial 42
Failed to complete in trial 43
Failed to complete in trial 44
Failed to complete in trial 45
Failed to complete in trial 46
Failed to complete in trial 47
Failed to complete in trial 48
Failed to complete in trial 49
Failed to complete in trial 50
Failed to complete in trial 51
```

### MountainCar3

Failed to complete in trial	51
Failed to complete in trial	52
Failed to complete in trial	53
Failed to complete in trial	54
Failed to complete in trial	55
Failed to complete in trial	56
Failed to complete in trial	57
Failed to complete in trial	58
Failed to complete in trial	59
Failed to complete in trial	60
Failed to complete in trial	61
Failed to complete in trial	62
Failed to complete in trial	63
Failed to complete in trial	64
Failed to complete in trial	65
Failed to complete in trial	66
Failed to complete in trial	67
Failed to complete in trial	68
Failed to complete in trial	69
Failed to complete in trial	70
Failed to complete in trial	71
Failed to complete in trial	72
Failed to complete in trial	73
Failed to complete in trial	74
Failed to complete in trial	75
Failed to complete in trial	76
Failed to complete in trial	77

### MountainCar4

Failed to complete in trial	78
Failed to complete in trial	79
Failed to complete in trial	80
Failed to complete in trial	81
Failed to complete in trial	82
Failed to complete in trial	83
Failed to complete in trial	84
Failed to complete in trial	85
Failed to complete in trial	86
Failed to complete in trial	87
Failed to complete in trial	88
Completed in	89 trials



## MountainCarNoDQN

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Failed to complete in trial 975  
Failed to complete in trial 976  
Failed to complete in trial 977  
Failed to complete in trial 978  
Failed to complete in trial 979  
Failed to complete in trial 980  
Failed to complete in trial 981  
Failed to complete in trial 982  
Failed to complete in trial 983  
Failed to complete in trial 984  
Failed to complete in trial 985  
Failed to complete in trial 986  
Failed to complete in trial 987  
Failed to complete in trial 988  
Failed to complete in trial 989  
Failed to complete in trial 990  
Failed to complete in trial 991  
Failed to complete in trial 992  
Failed to complete in trial 993  
Failed to complete in trial 994  
Failed to complete in trial 995  
Failed to complete in trial 996  
Failed to complete in trial 997  
Failed to complete in trial 998  
Failed to complete in trial 999