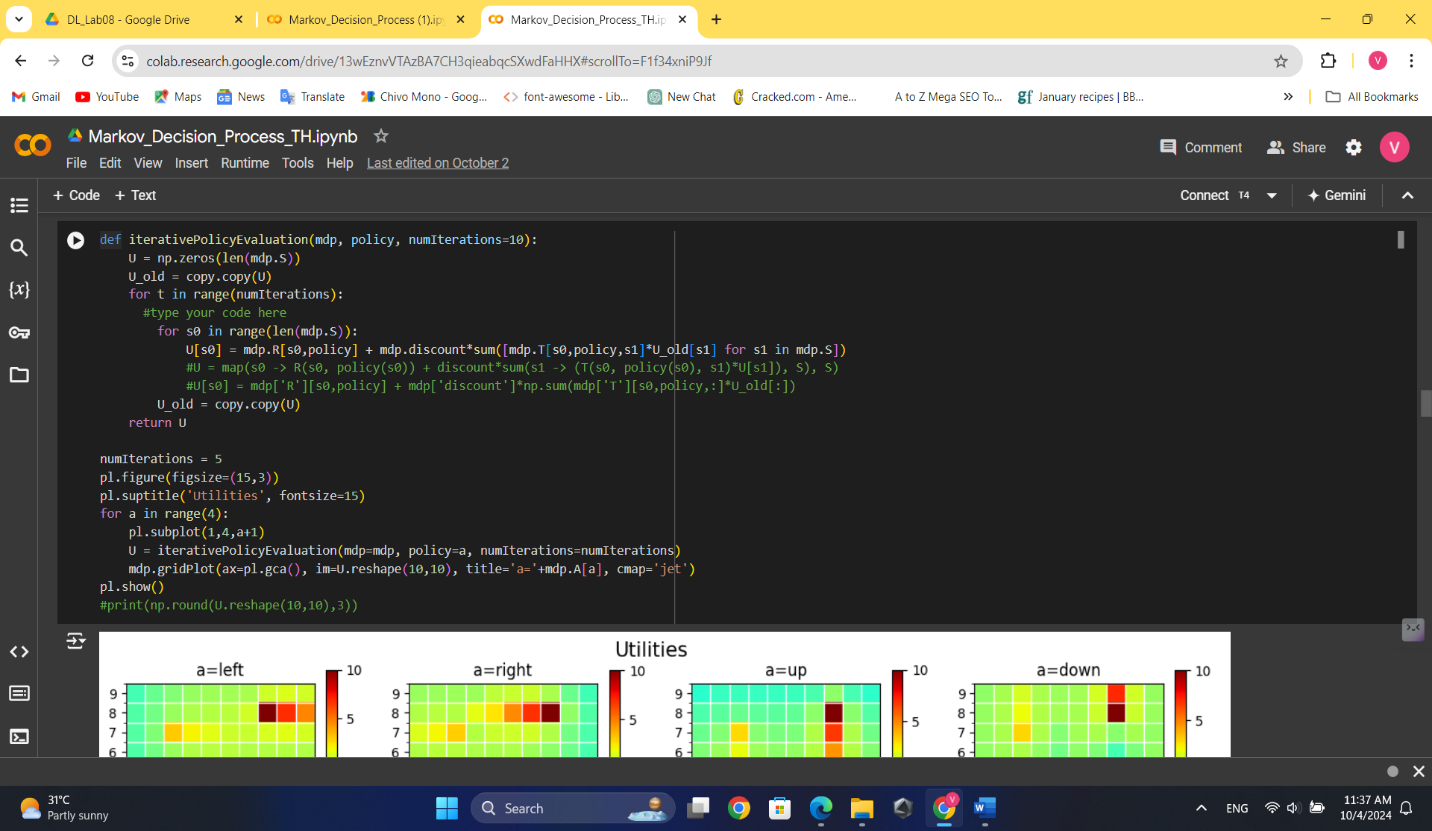
IT21207754

GitHub repository:

<https://github.com/Isuru-rangana/DL_Lab/tree/main/Lab08/CompletedLab08>

SE4050 – Deep Learning

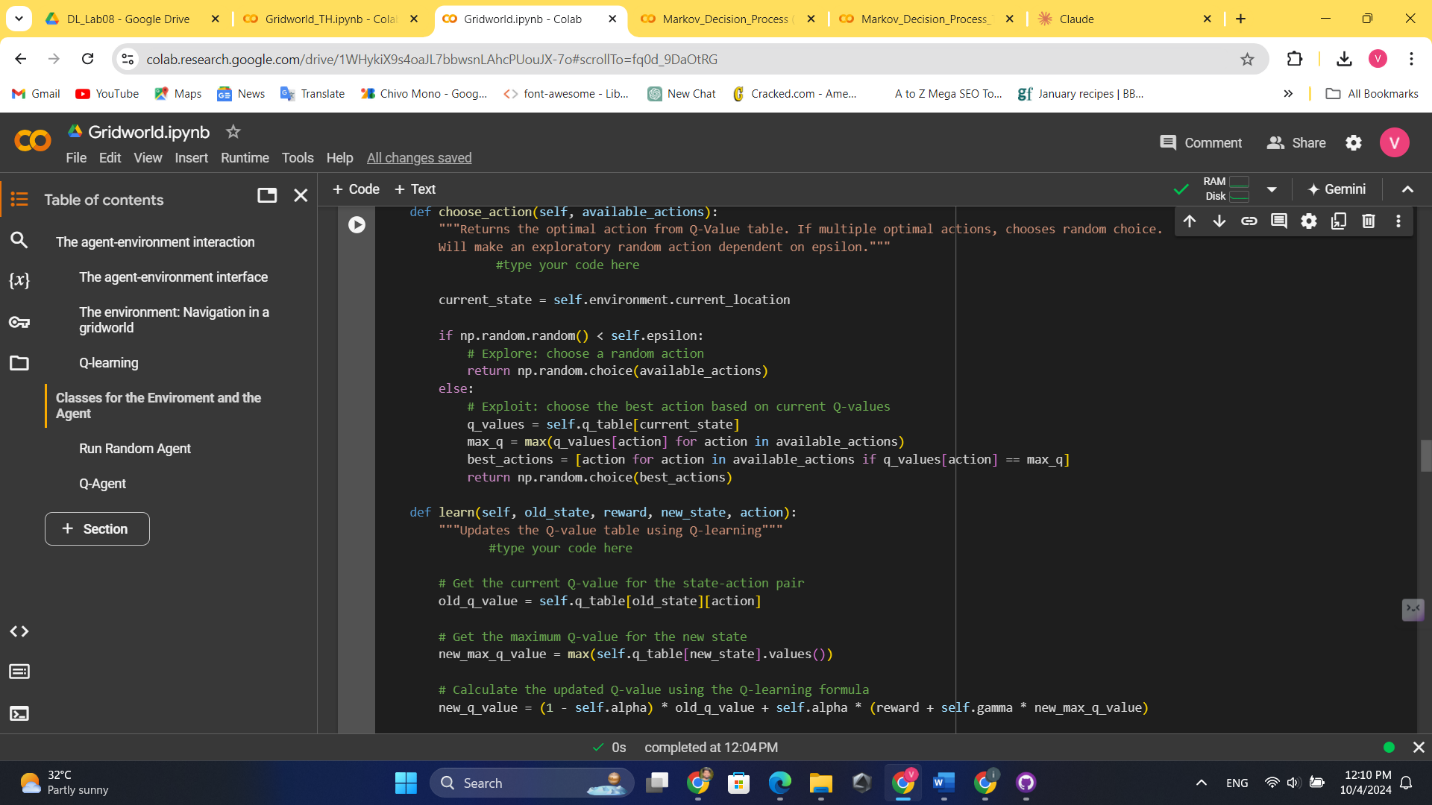
Question 1: Markov Decision Process and Q-Learning



A screenshot of a computer

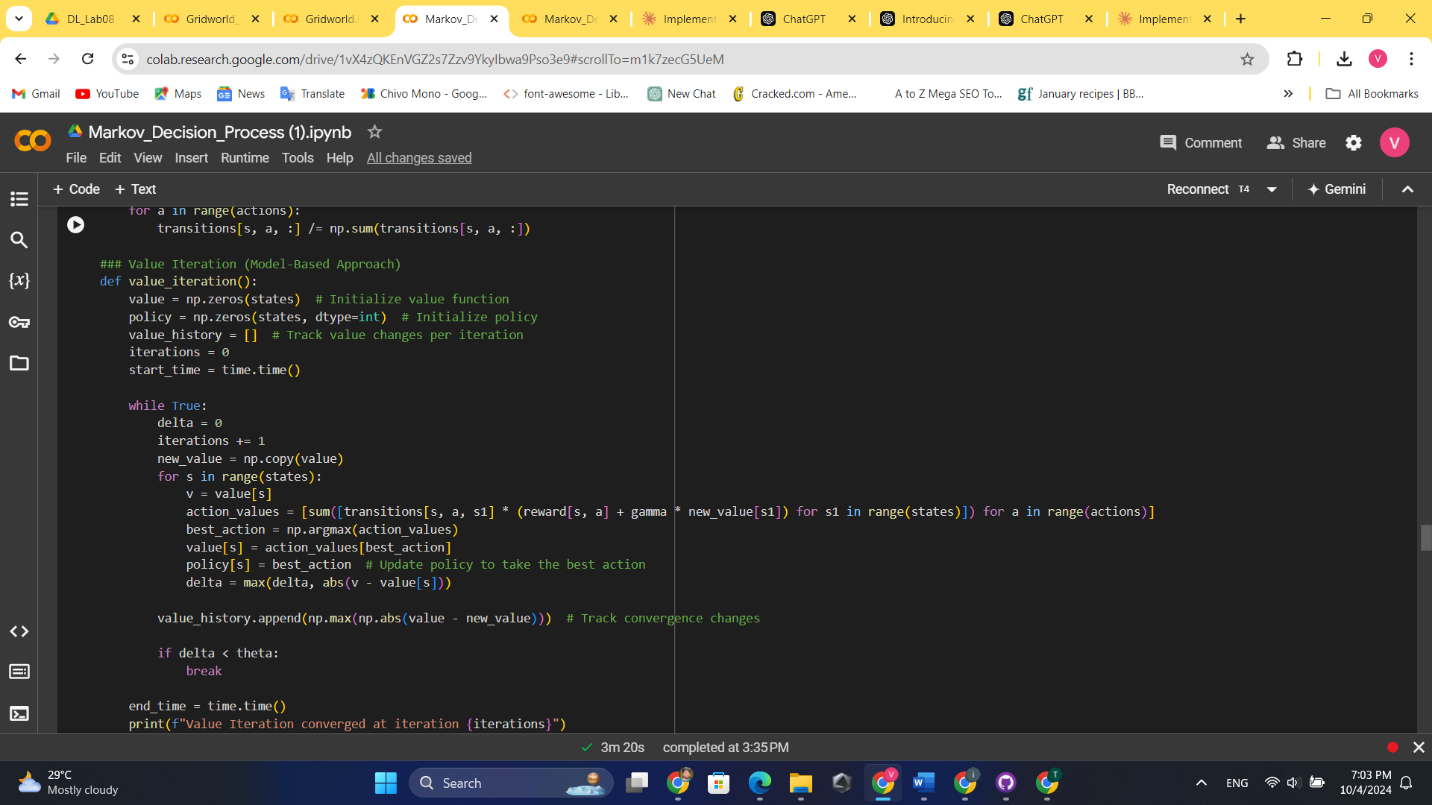
Description automatically generated

Gridworld.ipynb



Question 2: Model-Based vs Model-Free Reinforcement Learning

Implement the Model-Based Approach (Value Iteration)



Implement the Model-Free Approach (Q-Learning)

A screenshot of a computer

Description automatically generated

 Visualize Value Iteration Convergence

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

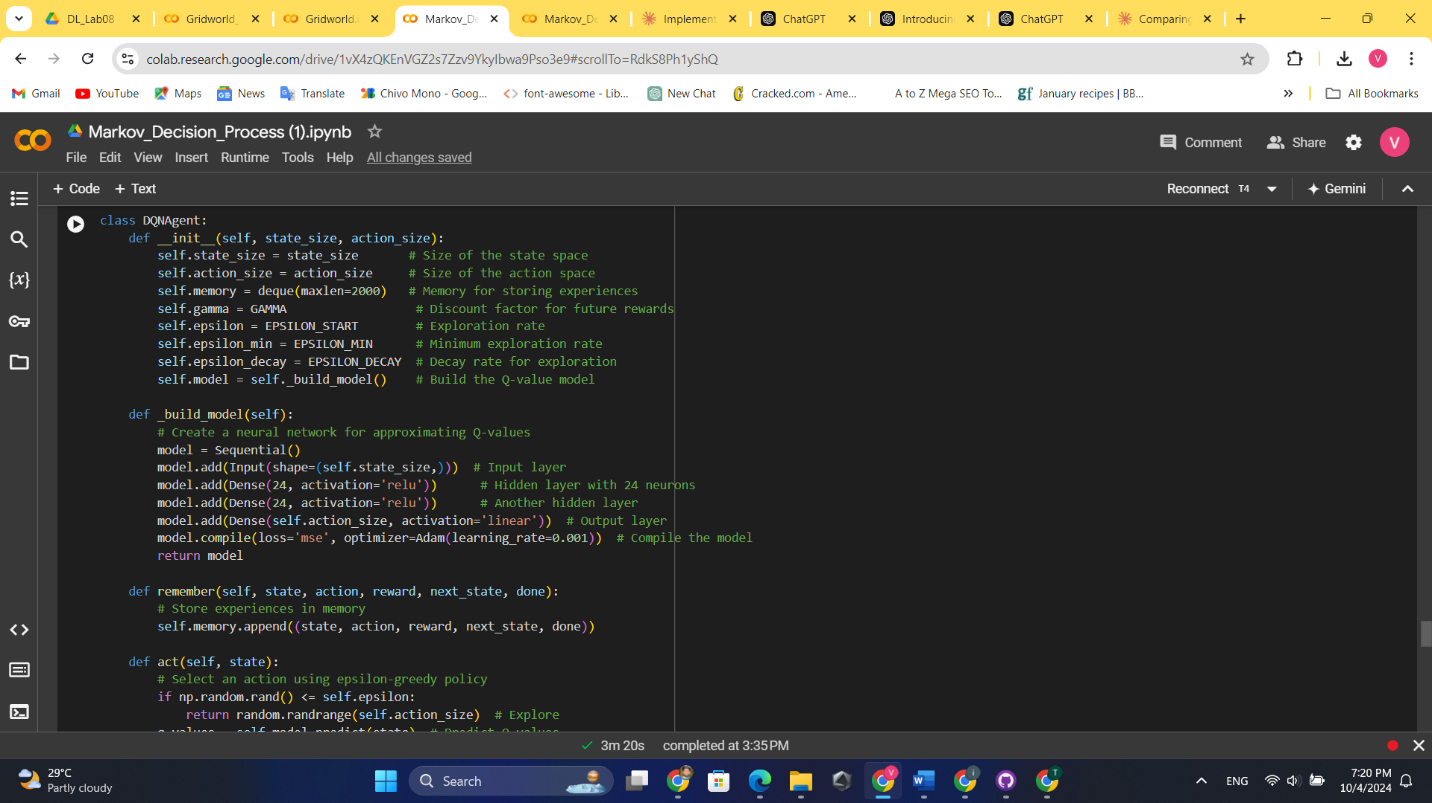
2. Explain the difference between Model-Based and Model-Free algorithms briefly.

**Model-Based algorithms use an explicit model of the environment to make decisions. They learn or are given a representation of how the environment works, including state transitions and rewards. These algorithms plan actions by simulating possible outcomes using this model.**

**Model-Free algorithms, on the other hand, learn directly from experience without using an explicit model of the environment. They interact with the environment through trial and error, updating their understanding based on the outcomes they observe**

Question 3: Introduction to Deep Q-Learning (DQN)

DQN agent interacts with the environment.



Train the DQN agent.

A screenshot of a computer

Description automatically generated

Plotting & dqn performance with different Values

A screenshot of a computer

Description automatically generated

**A screenshot of a computer screen

Description automatically generated**