



**National University of Computer & Emerging Sciences, Karachi   
Computer Science Department**

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| **Course Code: AI-2002** | **Course: Artificial Intelligence Lab** |
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**Summer 2023, Lab Manual – 10**

**Tasks**

1. Implement Q-learning algorithm using OpenAI gym environment.
2. The Smartcab's job is to pick up the passenger at one location and drop them off in another.

The agent should receive a high positive reward for a successful drop-off because this behavior is highly desired

The agent should be penalized if it tries to drop off a passenger in wrong locations

The agent should get a slight negative reward for not making it to the destination after every time-step.

The passenger can be in one of the four possible locations: R, G, Y, B, which are represented in row, column coordinates as (0,0), (0,4), (4,0), (4,3) respectively. Additionally, we need to consider a fifth state where the passenger is already inside the taxi. Therefore, the number of possible states for the passenger's location is 5.

The destination can be one of the four possible locations: R, G, Y, B, which are also represented in row, column coordinates. Therefore, the number of possible states for the destination is 4.

We have six possible actions:

1. south
2. north
3. east
4. west
5. pickup
6. dropoff

Implement the above problem using Gym environment called **Taxi-V2.**