

# DRL Assignment 1

7/9/2024

10 Points Possible

Attempt 1



In Progress

**NEXT UP: Submit Assignment**



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**2 Attempts Allowed**

6/26/2024 to 7/9/2024

▼ Details

## DRL Assignment

**Course ID:** S2-23\_AIMLCZG512

**Course Name:** Deep Reinforcement Learning

**Assignment Objective:** Hands-on experience on conceptual topics Multi-Arm Bandit and Dynamic Programming taught in the class.

**Total Marks:** 10


**Submission Deadline:** 09/July/2024

### Instructions:


- Solve both the assignment problems.
- Read the assignment proposal carefully.
- If any of the requirements are missed in the final code submission, the respective marks will be deducted.
- It is mandatory to submit the assignment in the **PDF format only** consisting of all the outcomes with each and every iteration. Any other format will not be accepted.
- Add comments and description to every function you are creating or operation you are performing. If not found, then 1 mark will be deducted. There are many assignments that need to be evaluated. By providing the comments and description it will help the evaluator to understand your code quickly and clearly.
- Maintain the same naming conventions for the PDF files to be submitted as that of ipynb files.
- Submit 2 different pdfs. One for Arm-bandit and One for Dynamic Programming

## Two Assignment Statements:

1. Multi-Arm Bandit Problem (**5 Marks**): Imagine an innovative digital advertising agency, AdMasters Inc., that specializes in maximizing click-through rates (CTR) for their clients' advertisements. One of their clients has identified four key tunable elements in their ads: Age, City, Gender, and Mobile Operating System (OS). These elements significantly influence user engagement and conversion rates. The client is keen to optimize their CTR while minimizing resource expenditure.

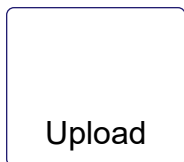
**Template:** [MAB\\_Click\\_Through\\_rate.ipynb \(https://bits-pilani.instructure.com/courses/2825/files/548674?wrap=1\)](https://bits-pilani.instructure.com/courses/2825/files/548674?wrap=1)  (https://bits-pilani.instructure.com/courses/2825/files/548674/download?download\_frd=1) *(The dataset link is provided in the colab)*

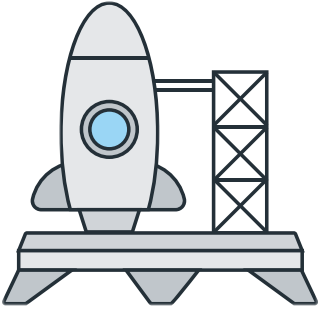
1. Dynamic Programming (**5 Marks**): Develop a reinforcement learning agent using dynamic programming methods to solve the Dice game optimally. The agent will learn the optimal policy by iteratively evaluating and improving its strategy based on the state-value function and the Bellman equations.

**Template:** [Dice\\_Game\\_using\\_Dynamic\\_Programming.ipynb \(https://bits-pilani.instructure.com/courses/2825/files/548675?wrap=1\)](https://bits-pilani.instructure.com/courses/2825/files/548675?wrap=1)  (https://bits-pilani.instructure.com/courses/2825/files/548675/download?download\_frd=1)

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