Project 1 – Part a

IB00398: Introduction to Deep Reinforcement Learning

Instructor: Manyou Ma Due Date: October 11

Name:

Student Number:

Email:

(Home) University:

Year of Entrance:

Specialization / Major:

Project Title:

Please complete this questionnaire to ensure your project topic is well-defined, feasible, unique, and aligned with your goals. You may submit a **TYPED** PDF or directly modify the LaTeXsource code.

Topic Quality

1. **Problem Statement**

   What is your project about? (150 Words)

2. **MDP Suitability**

   Can this problem be modeled with **states, actions, and rewards**? Briefly describe:

   States:

   Actions:

   Rewards:

3. **Motivation**

   Why is this problem interesting and meaningful? (100 Words)

4. **Personal Interest**

   Am I personally interested to work on this problem? Why or why not?

5. **Career and Academic Alignment**

   How does this project connect to my career or academic goals?

   Job readiness / skills employers value:

   Academic paper or portfolio potential:

6. **Degree Program Relevance**

   Can I use knowledge from my other classes (e.g., mechatronics, cybersecurity, communications, control) in this project? Which course and how?

7. **Feasibility**

   Do I have enough data and domain knowledge to build a simple simulator? What data or approximations will I use?

8. **Uniqueness**

   Is your topic original, or does it go beyond copying an existing GitHub repo/tutorial? What makes it unique?

MDP Components

Your project must include at least **10 states** and **3 distinct actions**. Actions should represent **different categories of decisions**, not just variations of the same one.

- Not acceptable: {move left, move right, move up, move down}
- Better example: {move, pick up object, drop object, wait, signal another agent}

States and actions may be **discrete** (finite categories) or **continuous** (real values).

- Discrete example (traffic light): States = {low, medium, high traffic}, Actions = {switch to green, switch to red}.
- Continuous example (drone): States = (x, y, z, v_x, v_y, v_z), Actions = thrust vector (f_x, f_y, f_z), yaw angle θ.

9. **States (at least 10)**
   List possible states for your problem. Mark if they are discrete or continuous.

10. **Actions (at least 3 distinct)**
    List possible actions for your agent. Mark if they are discrete or continuous.

11. **Rewards**

    What is the reward signal? How is success measured?

12. **Transitions**

    Are the transitions between states clear and plausible? Briefly explain how the system evolves.

Literature Survey

13. **References**

    List at least 3–6 related papers or articles you have found.

Note: This questionnaire is for your own benefit. Be honest and specific. If you are unsure about any part, or if you need help finding a suitable topic, please check with me before the due date of this assignment. – Version 0, Sept. 26, 2025