

DA-IICT, IT 567, Winter 2024-2025
Lab Exercise 4
Date: 03/02/2025, Expected by: 12/02/2025
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References for perusal:

- [1] *Reinforcement Learning: An Introduction*, 2nd edition, Richard S. Sutton, and Andrew G. Barto, The MIT Press, 2018.
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- The lab exercise comprises of 3 problems. All the problems involve analytical and simulation work.
 - All the problems need to be solved individually. However, collaboration is encouraged for building an initial understanding of the problem, and subsequently, for creating the solution strategy.
 - All the required soft copies of the texts referred to in the exercises are available in the lecture folder of the instructor.
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1. Study pgs. 64-66 from chapter 3 and understand the solution to examples 3.8 and 3.9. Write code wherever required.
 2. In reference to Fig. 4.1 on page 77 of [1], read last two paragraphs on page 79 to clearly understand the greedy policy diagrams in Fig. 4.1.
 3. From [1], study and write the code for the Jacks Car Rental problem from example 4.2 in chapter 4, pg. 81. Then, solve exercises 4.4 and 4.5. Note that you may find videos on Youtube related to the problem. You may choose the one which you find best.
 4. Write an article on “Dynamic programming & its association with Bellman equation”. You can see the Wikipedia articles on “Dynamic programming” and “Bellman equation”, or any other references including books and online resources.

Instructions for Preparing Lab Report:

- For analytical problems, either create a digital copy of your solution (through latex/Word/etc.), or write it on a paper and scan. Whichever choice you make, send it to the instructor through email.
- For problems solved in simulations environments (python/Visual studio/etc.), send the code file along with the snapshot of the result.

General Instructions:

- The lab is intentionally made from the references given above so that you have ample resources to refer to and learn.
- For the final evaluation, we may have a quiz/lab test which will test if you have read through the references and solved the problems yourself.