

# CSCI 397: Introduction to RL

## Designing RL Loop and Dynamic Programming

**Due Date: Friday September 15<sup>th</sup> @ 11:59 PM**

### Information

This assignment focuses on designing and flushing out an RL problem. In addition, you will be completing a dynamic programming problem. Dynamic programming is essentially what RL is all about, capturing a history that is then used to solve a problem of determining an action at the current state. You will complete everything in this assignment via GitHub and turn in the link on canvas. You may need to set up a GH account and invite me to your repository for me to view your code. You should interact with your GH projects by making commits, opening issues, and making branches. I will be partially grading you on your use of GH.

### Design RL Loop

For the RL problem I want you to design, I want you to develop an RL loop for marketing and advertising. You want to perform a series of advertising actions (TV, Radio, Flyers) and you want people to buy your products. You have complete freedom to define the agent, action space, state, and reward. All four of those components must exist and I want to see that you put in effort to flush out the problem. Lastly, discuss challenges with defining the state, action, reward for your RL loop.

### Dynamic Programming Problem

Given  $n$  non-negative integers representing an elevation map where the width of each bar is 1, compute how much water it can trap after raining.

Example:



Input: height = [0,1,0,2,1,0,1,3,2,1,2,1]

Output: 6

The above elevation map (black section) is represented by array [0,1,0,2,1,0,1,3,2,1,2,1]. In this case, 6 units of rainwater (blue section) are being trapped.

Please upload your answer to your GitHub repo and invite me, I will pull down the code and run it locally to determine the validity of your solution.