

CSC 242: Homework 3

Assigned on Feb. 16
Hand in before 2pm Mar. 3 (Tuesday)

Requirement

Please hand in the hard copy of your homework in our class (that is, before 2pm) on Feb. 24 (Tuesday). If you need to use your delay coupon, you can hand in your homework to my office. Include the **class ID number** assigned to you for this class, **your name**, and **how many days** late it is (if handed in late) in the headline. The ID number is used to simply the grading procedure. If you do not know your ID number assigned to you, you can check the link.¹ If you are not on the list, please contact our TA Sean Esterkin (sesterki@u.rochester.edu). (*), (**), or (***) indicates the difficulty of each question.

Policy

We apply the late policy explained in syllabus to all homework. Any grading questions must be raised with the TA in two weeks after the homework is returned.

The homework must be completed individually. However, you are encouraged to discuss the general algorithms and ideas with classmates in order to help you answer the questions. You are also allowed to share examples that are not on the homework in order to demonstrate how to solve problems. If you work with one or more other people on the general discussion of the assignment questions, please record their names over every question they participated.

However, the following behaviors will receive heavy penalties (lose all points and apply the honest policy explained in syllabus)

- explicitly tell somebody else the answers;
- explicitly copy answers or code fragments from anyone or anywhere;
- allow your answers to be copied;
- get code from Web.

¹https://docs.google.com/spreadsheets/d/1hgxcxqFxBxZYb55_HHi2pWQt0rEyEppcStSZBKni8MU/edit?usp=sharing

1 (*) Decision Tree: 3 points

In a given classification problem there are three classes only: class 1, class 2, and class 3. There are three features: A , B , and C :

$$A \in \{\text{red, blue}\}, \quad B \in \{\text{true, false}\}, \quad C \in \{1, 2, 3\}.$$

Given the following possible logical statement or rule, draw a corresponding decision tree.

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IF(( $A = \text{red AND } C = 1$ ) OR ( $A = \text{blue AND } C \in \{1, 2\} \text{ AND } B = \text{false}$ ))  
  THEN class label = class 1  
ELSE IF (( $A = \text{red AND } C = 2$ ) OR ( $A = \text{blue AND } C = 3$ )  
  OR ( $A = \text{blue AND } C = 1 \text{ AND } B = \text{true}$ ))  
  THEN class label = class 2  
OTHERWISE class label = class 3.
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2 (*) Question 18.6, AI textbook: 3 points