

CSCI 5270 – Machine Learning

Lab 3 - Binary and Multi-class Classification Using Decision Trees and Random Forests

# Activity

## Overview

In this assignment, you'll get to practice some of the concepts and skills covered in the course so far.

## Procedure

1. To complete this assignment, you must download the following from D2L:
   1. **Lab 3 - Binary and Multi-class Classification Using Decision Trees and Random Forests.ipynb** notebook,
   2. **weatherAUS.csv** file
   3. **penguins.csv** file.
2. Save your work as **Lab3.ipynb** file and submit to **Lab 3 - Binary and Multi-class Classification Using Decision Trees and Random Forests (Dropbox)** by the due date.
3. As you go through the notebook, you will find the symbol ??? in certain places. To complete this assignment, you must replace all the ??? with appropriate values, expressions or statements to ensure that the notebook runs properly end-to-end.
4. Include your response for Part 1 and Part 2 in the notebook. Only one file submission (the IPYNB file)
5. Use markdown cells to write your discussions and reflections.

Part 1: Activity

1. You will find the specifications for this part of the assingment in **Lab 3 - Binary and Multi-class Classification Using Decision Trees and Random Forests** notebook on D2L.
2. Write and run your python code for this part on jupyter notebook

# Part2: Reflection

1. You will find the specifications for this part of the assingment in **Lab 3 - Binary and Multi-class Classification Using Decision Trees and Random Forests** notebook on D2L.
2. Write your reflection for this part on jupyter notebook as markdown cells.

# Submission

Submit **Lab3.ipynb** to the **Lab 3 - Binary and Multi-class Classification Using Decision Trees and Random Forests (Dropbox)** on D2L by the due date.

# Grading Rubric

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Criterion** | **Excellent** | **Good** | **Average** | **Below Average** | **Poor** | **No Attempt** |
| **Part 1:** Activity-Question 1.1 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 1.2 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 1.3 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 1.4 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 1.5 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 1.6 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 1.7 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 1.8 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 2.1 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 2.2 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 2.3 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 2.4 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 2.5 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 2.6 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 2.7 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 1:** Activity-Question 2.8 | 10 points  Completes all aspects of the question correctly | 8 points  Completes most aspects of the question correctly | 6 points  Completes aspects of the question correctly, and some incorrectly | 4 points  Completes most aspects of the question incorrectly or does not attempt many aspects | 2 points  Minimal effort or completes a few aspects of the question or very few correctly | 0 points  Did not complete the question |
| **Part 2:** Reflection | 10 points  Reflection clearly ties to the module content; experience and importance clearly laid out | 8 points  Reflection mostly ties to the module content; experience & importance are discussed | 6 points  Reflection ties minimally to the module content; experience & importance are discussed but not thoroughly | 4 points  Reflection does not tie to the module content; experience & importance are minimally discussed | 2 points  Minimal effort to tie to content; minimal effort to describe experience/ importance | 0 points  Did not complete the reflection |