

COSC 311 - Lab 6

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Due: 10 December

1 Objectives

In this lab, we will

1. Practice visualizing and presenting the behavior of a complex algorithm on data
2. Continue developing skills with Python, Jupyter notebooks, and data-processing libraries

2 Tasks

1. You may submit this lab in groups of one or two.
2. Begin by installing the `shap` library for Python (homepage at <https://github.com/slundberg/shap>).
3. Do the following with 1) the Iris dataset from last lab, 2) the Adult dataset from last lab, and 3) the dataset you are using for Project 2. Be sure to provide thorough evaluations of the resulting visualizations; use examples from the plots and clear written descriptions to accompany each one. Remember that the ideas here are to help humans understand why a model makes the predictions that it does. So first come up with an explanation for yourself and then write it in a concise way to also convince your reader.
 - (a) Train a model from the `scikit-learn` library on the data (e.g. support vector machine, tree classifier, multilayer perceptron). That is, your goal for the iris dataset is a multi-class decision of the iris species, for the adults, the decision is whether or not a person makes over \$50k, and for your project data will depend on your own focus.
 - (b) Using the `shap` package (see the linked documentation), plot the waterfall graph of SHAP values of the features in your data; do this for a couple different predictions, how do they differ for different class outputs? Try for both a correct and incorrect prediction.
 - (c) Try the `force` plot on some individual SHAP values and also the entire set of predictions. What do these indicate about the influence of various features in your data?
 - (d) Try the above with a second model and compare and contrast the results. If you were to use one of these in a practical setting (i.e. your job/income/business depends on it), which would you choose and why?

3 Submission

Submit any notebooks, Python files, and documentation to the MyClasses assignment page.