# CSC 546/746
## Assignment 5
## (25 points)

1. (1 point) Create a new Jupyter Notebook project and name it as "hw05.ipynb".
2. (1 points) Read data from the "hw05_data.csv".
3. (8 points) Train a decision tree model based on the data:
    a. The features are "Weather", "Just Ate", and "Work Late".
    b. The target is "Will Exercise?"
    c. The decision tree will predict whether the person will go out for exercise based on the features.
    d. The Scikit-Learn Decision Tree model can only take numerical data, so you will need to use *one-hot encoding* to convert the original data to zero and one.
    e. Train the model with *Gini impurity* measurement
    f. Don't limit the maximum depth of the tree.
4. (2 points) Display the decision tree.
5. (1 point) Display the prediction result with the following input:
   Weather: Sunny
   Just Ate: yes
   Work Late: yes
6. Submit "hw05.ipynb" to the Blackboard.
7. (12 points) Build a decision tree manually with the data from "hw05_data.csv".
    a. Use ID3(Entropy) algorithm
    b. Must provide all steps (Calculate all Entropy values and Information Gains, and show how you select the split features for each level)
    c. Draw the final decision tree.
    d. Submit your answer to the blackboard. (You can write the answers on a paper and upload a picture of the paper, or you can use an electronic tool and upload the file.)