Homework 4 - Weighted Majority

# Instructions

Most homework assignments for this class will consist of two tasks:

1. **Reading/Video**: This will be an article or video about a topic in machine learning related to what we have learned so far in the class. After you read the article or watch the video, we will ask you to answer some comprehension questions (typed or handwritten responses are fine), which will relate to the class content, coding activity, and/or to the reading/video. We will start off class next week by discussing these comprehension questions (remind us if we forget!)
2. **Coding**: This consists of completing the coding file you were working on in class today. This does not include the bonus challenge, although you are welcome to complete that if you want!

# Reading

Please read the below article and the two videos below about a new electrical grid system. The first two questions below are about this week’s algorithm Weighted Majority and this week’s coding assignment. The following questions is about the video on body estimation with machine learning.

https://www.youtube.com/watch?v=pW6nZXeWlGM

## Comprehension Questions

1. We looked at how a weighted majority algorithm can look at multiple predictions and combine them to make a movie prediction. What does this tell you about a site like rottentomatoes.com that gives you a bulk percentage of reviews of a movie? Is looking at a percentage “fresh” or “rotten” an accurate way to see if you will like a movie? Explain.
2. We learned about decision trees last week and weighted majority this week. What do you think are the major pros and cons of one algorithm versus the other? Is one more interpretable than the other? In other words, if one thing does not predict an outcome well as another thing, they both are able to figure it out. Does one tell you how much better or worse at predicting one attribute is?
3. In machine learning, often many different problems have to be solved, one step at a time. In the attached video, they were able to predict the movements of multiple people in a video frame. On a broad level what would be the steps of problems that would have to be solved in order to do this? In other words, if one machine learning task takes training data and predicts an outcome based on it, how many tasks would have to be learned here and in what order would they have to be learned and predicted? For instance, would it have to recognize an arm before recognizing that it’s attached to a person? Would it have to recognize a person before it recognizes dancing? Would it have to recognize perspectives of the floor the person is on?