HMC CS 158
Quiz 1: ML Basics

1. A computer program is said to learn from experience E with respect to some task T and some performance measure P if its performance on T, as measured by P, improves with experience E. Suppose we feed a learning algorithm a lot of historical weather data and have it learn to predict weather. In this setting, what is T?

   (a) The process of the algorithm examining a large amount of historical weather data.

   (b) The probability of it correctly predicting a future date's weather.

   (c) The weather prediction task.

   (d) None of these.

2. Suppose you are working on weather prediction, and use a learning algorithm to predict tomorrow's temperature (in degrees Centigrade/Fahrenheit). Would you treat this as a classification or a regression problem?

   (a) Regression

   (b) Classification

3. Suppose you are working on stock market prediction, and you would like to predict the price of a particular stock tomorrow (measured in dollars). You want to use a learning algorithm for this. Would you treat this as a classification or a regression problem?

   (a) Regression

   (b) Classification

4. Some of the problems below are best addressed using a supervised learning algorithm, and the others with an unsupervised learning algorithm. Which of the following would you apply supervised learning to? (Select all that apply.) In each case, assume some appropriate dataset is available for your algorithm to learn from.

   (a) Take a collection of 1000 essays written on the US Economy, and find a way to automatically group these essays into a small number of groups of essays that are somehow "similar" or "related".

   (b) Given a large dataset of medical records from patients suffering from heart disease, try to learn whether there might be different clusters of such patients for which we might tailor separate treatments.

   (c) Have a computer examine an audio clip of a piece of music, and classify whether or not there are vocals (i.e. a human voice singing) in that audio clip, or if it is a clip of only musical instruments (and no vocals).

   (d) Given historical data of children's ages and heights, predict children's height as a function of their age.

5. Which of these is a reasonable definition of machine learning?

This quiz is adapted from course material by Andrew Ng (Stanford).

(a) Machine learning is the science of programming computers.

(b) Machine learning is the field of study that gives computers the ability to learn without being explicitly programmed.

(c) Machine learning means labeled data.

(d) Machine learning is the field of allowing robots to act intelligently.