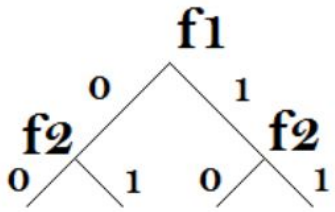
HMC CS 158
Quiz 2: Decision Trees, k-Nearest Neighbor

1. Consider the following balanced binary decision tree of depth 2 with features f_1 and f_2, each of which takes the value 0 and 1. What is the expressiveness of this decision tree? That is, what is the size of the space of distinct hypotheses that this tree can represent?



2. True or False: Without depth limiting or pruning (i.e. building the full tree), decision trees will always achieve 0% training error.

3. True or False: It is possible for a 2-class 1-NN to always classify all new examples as positive even though there are negative examples in the training data? (If true, show an example. If false, briefly explain.)

4. True or False: In most situations k-NN is faster to classify than Decision Trees.

This quiz is adapted from course material by Ziv Bar-Joseph and William Cohen (CMU).