Discriminative vs Generative Quiz CSE 255, Spring 2019

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Name: _____

PID: _____

This is a quiz for CSE255/DSE230
On your desk you should have only the exam paper and writing tools.
No hats or hoods allowed (unless religious items).
There is one question in this quiz.
Write your answer in the lines provided.
You have 5 minutes to complete the exam.
Start by writing your name and PID on this page.
Good Luck!

Suppose you are given a set of n labeled points $(x_1, y_1), (x_2, y_2), \ldots, (x_n, y_n)$ where $x_i \in R^d$ and $y_i \in \{-1, +1\}$.

1) Suppose you know that the data is ganarated by drawing from two spherical gaussians with equal variances (radii), one corresponding to the label $+1$, the other corresponding to the label -1 and that examples are drawn from each gaussian with probability $1/2$. Your goal is to minimize the error on a test set drawn from the same distribution. What rule should you output. Express this rule as a mathematical expression.

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2) Suppose you know that the data was generated according to some distribution P. All you know about P is that there exists a linear classifier with small expected error. Your goal is the same, to minimize the error on a test set drawn from the same distribution. What rule should you output. Express this rule as a combination of words and mathematical expressions.

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