Michigan State University **Feb 9, 2024**
CMSE381 - Data Science

CMSE381 - Quiz 4

I will adhere to the Spartan Code of Honor in completing this assignment.

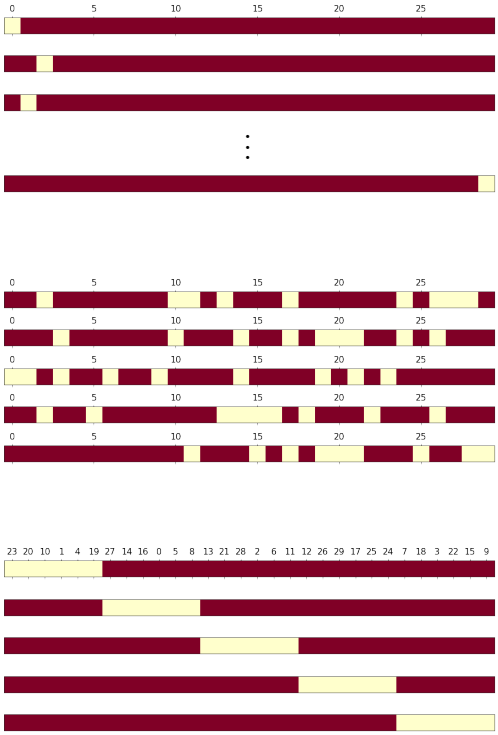
Signed: _____

1. (4pts) Match each name on the left to its picture representation on the right.

Validation set

Leave one out cross validation (LOOCV)

k-fold Cross Validation



2. (6pts) Assume stocks A, B, and C belong to the same industry. The price changes for these stocks today can be described as normally distributed, with means of 10%, 15%, and -1%, respectively, and a shared variance of 10%. These percentages represent the relative change in price. If I purchase one of these stocks today and sell it tomorrow, resulting in a 5% profit, which stock is most likely the one I bought, according to Linear Discriminant Analysis (LDA)? (assuming the prior probabilities of buying each of the stocks are the same)

$$\delta_k = x \cdot \frac{\mu_k}{\sigma_k^2} - \frac{\mu_k^2}{2\sigma_k^2} + \log \pi_k$$

$$\delta_k' = x \cdot \mu_k - \frac{\mu_k^2}{2}$$

$$\delta_1' = 0.05 \cdot 0.1 - \frac{0.1^2}{2}$$

$$\delta_2' = 0.05 \cdot 0.15 - \frac{0.15^2}{2}$$

$$\delta_3' = 0.05 \cdot (-0.01) - \frac{(0.01)^2}{2}$$