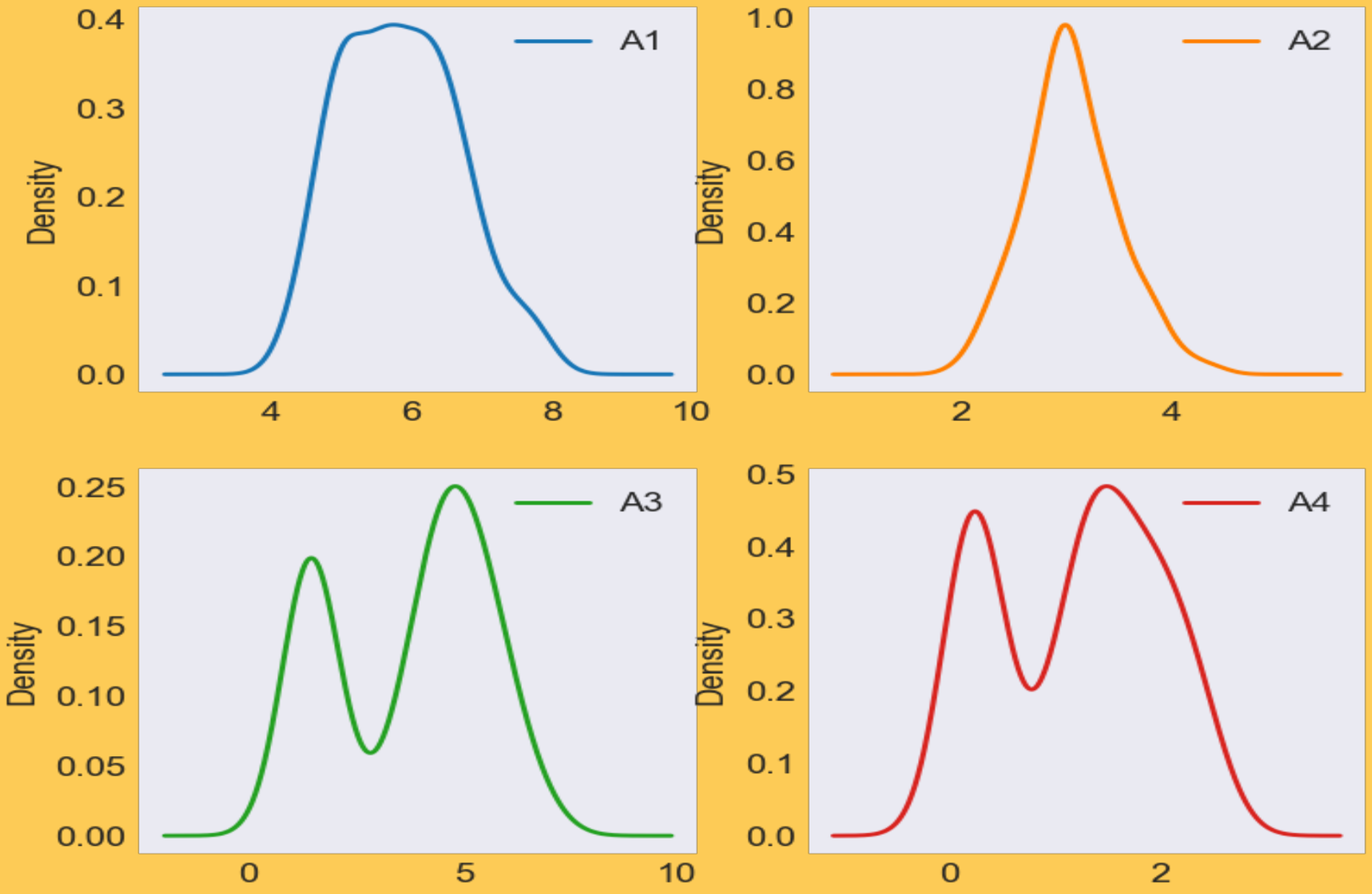
ABHISHEK DAS

# BCGDV MACHINE LEARNING ASSIGNMENT

# SECTION 1

# STANDARDIZATION VIA MIN-MAX SCALER

## SCALES ARE OF SIMILAR ORDER BUT DISTRIBUTIONS DIFFERENT



# K-MEANS CLUSTERING

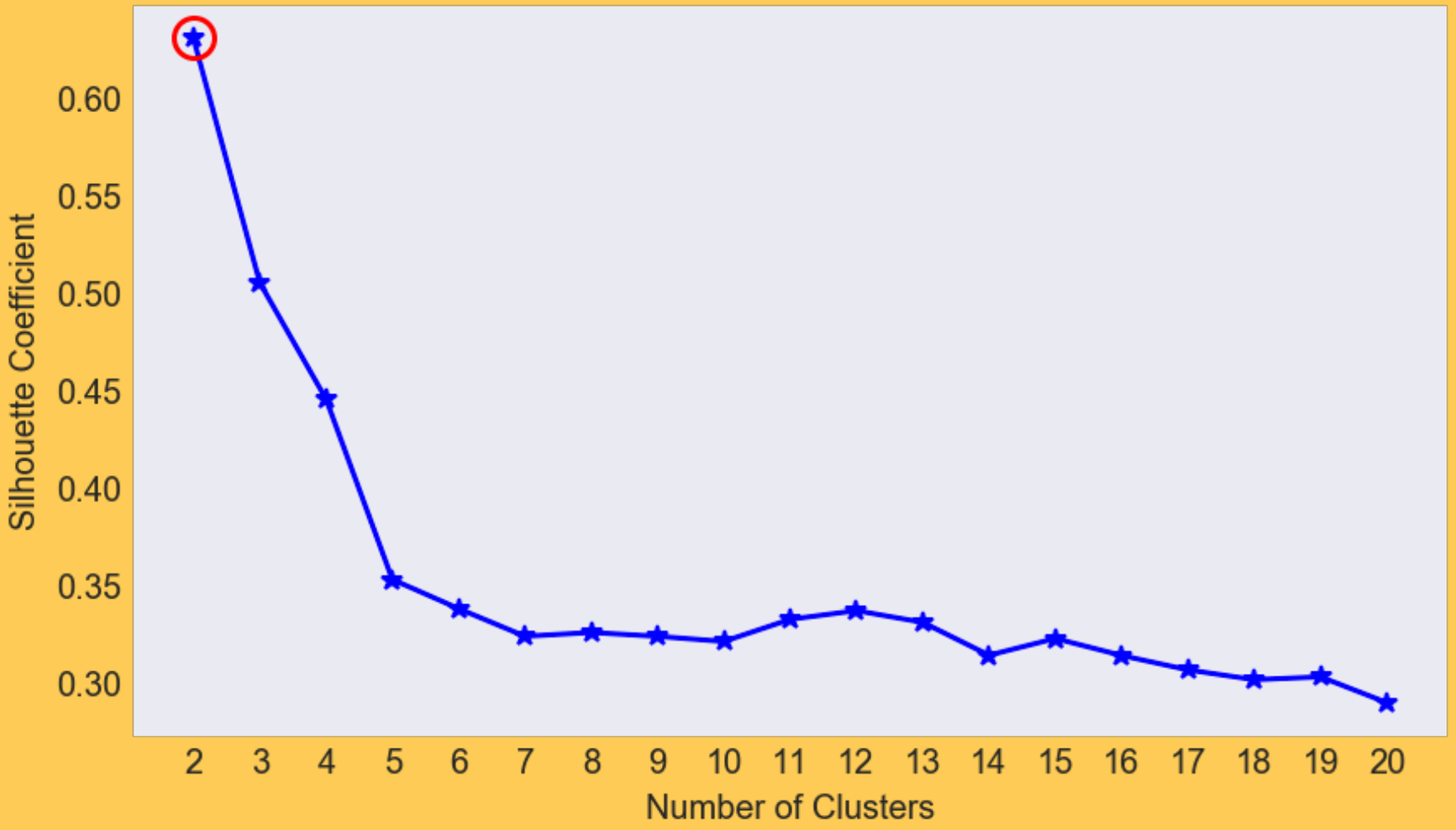
- Intuitive: Randomly pick centroids and move them until they are ‘center’ of data clusters

- Distance: Minimize within cluster variance = Euclidean$^2$

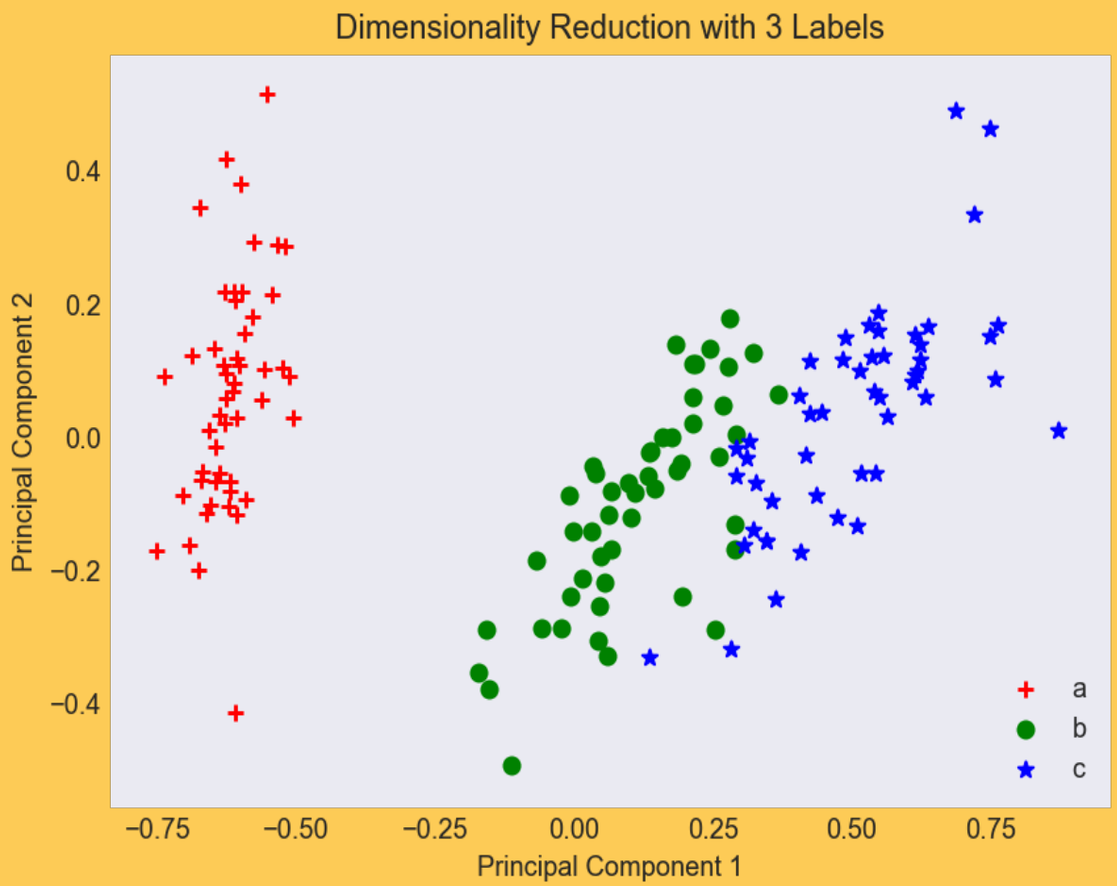
- Cohesion: How far are points from their centroid?
- Separation: How far are clusters from each other?

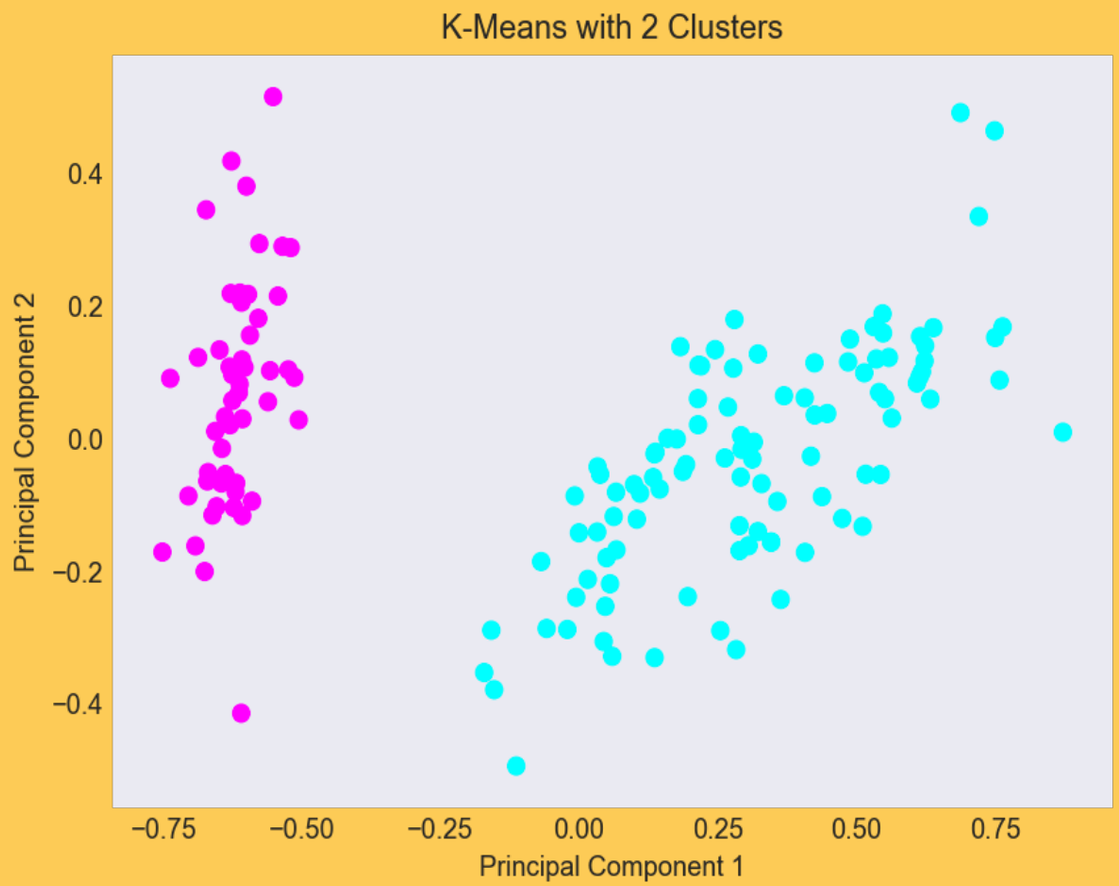
# CHOOSING THE K IN K-MEANS

## STANDARDIZED DATA

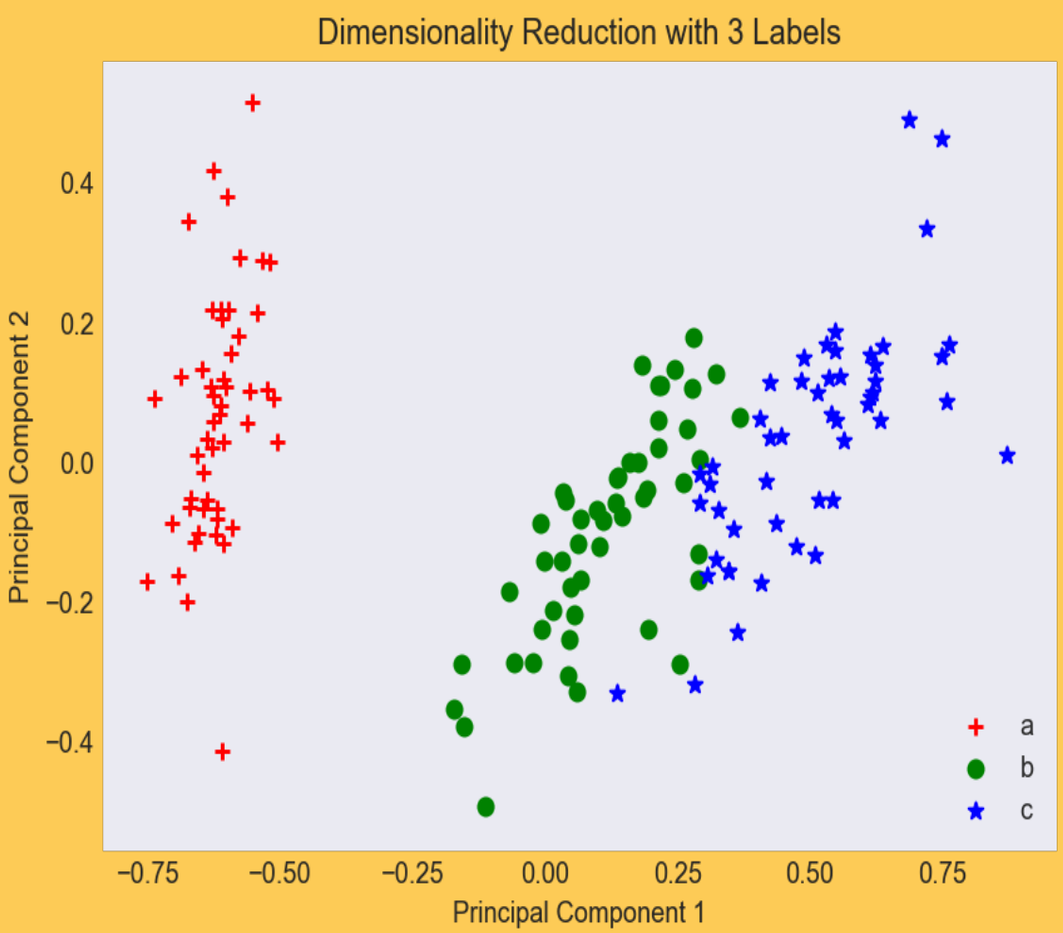


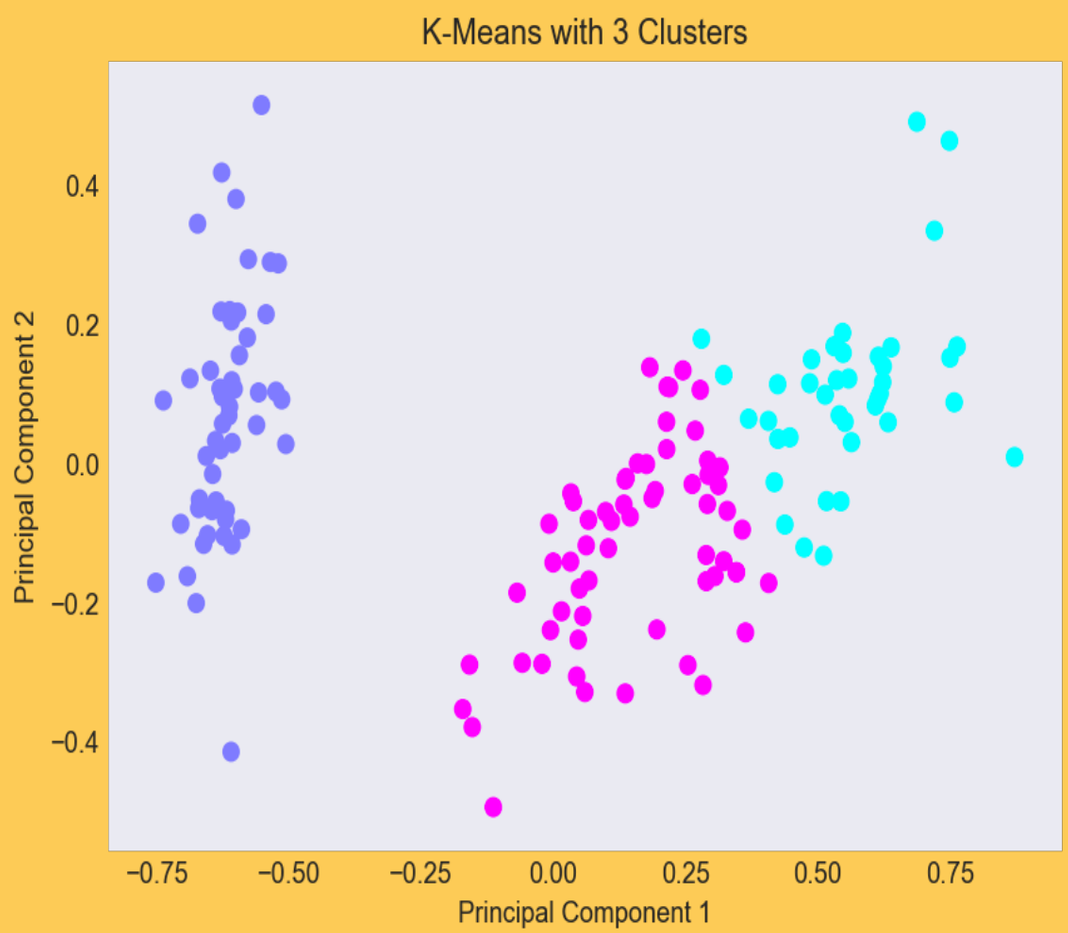
# B AND C ARE GROUPED TOGETHER



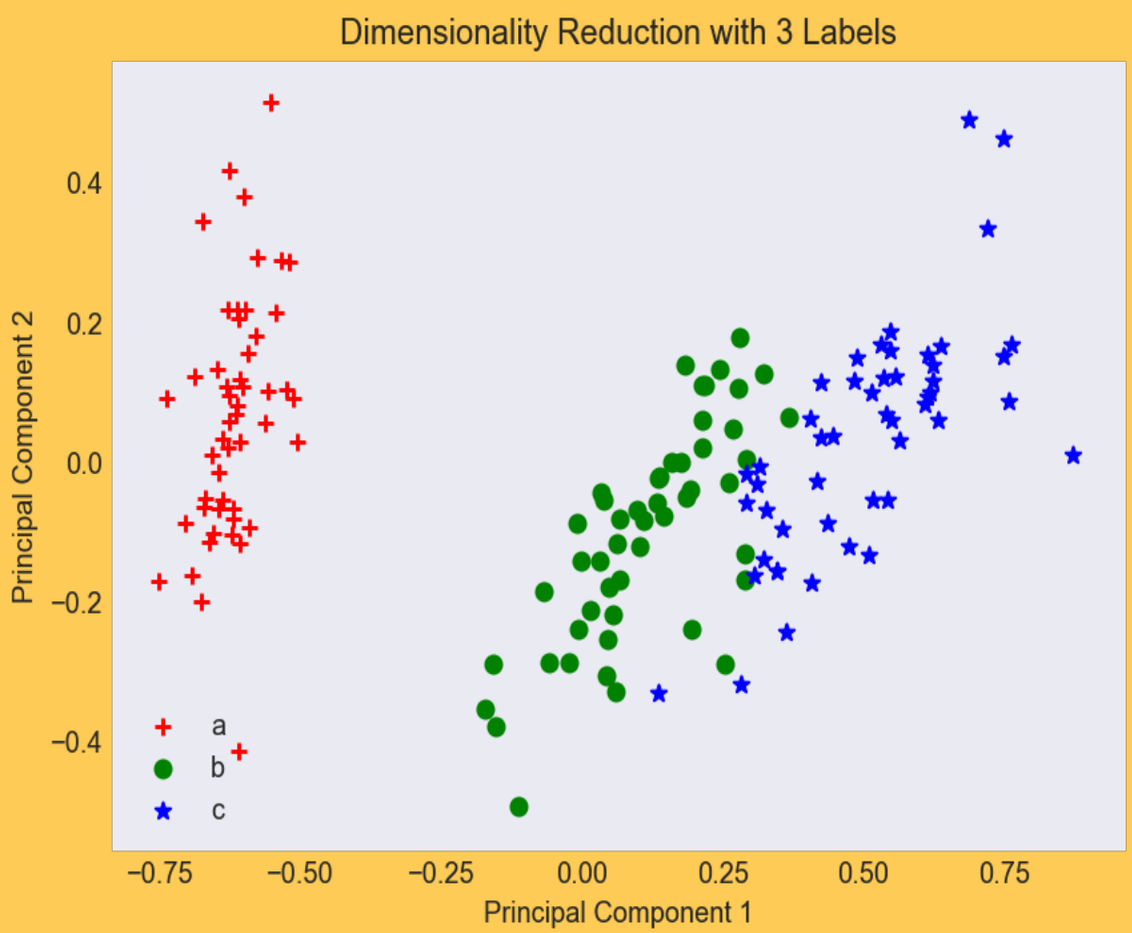



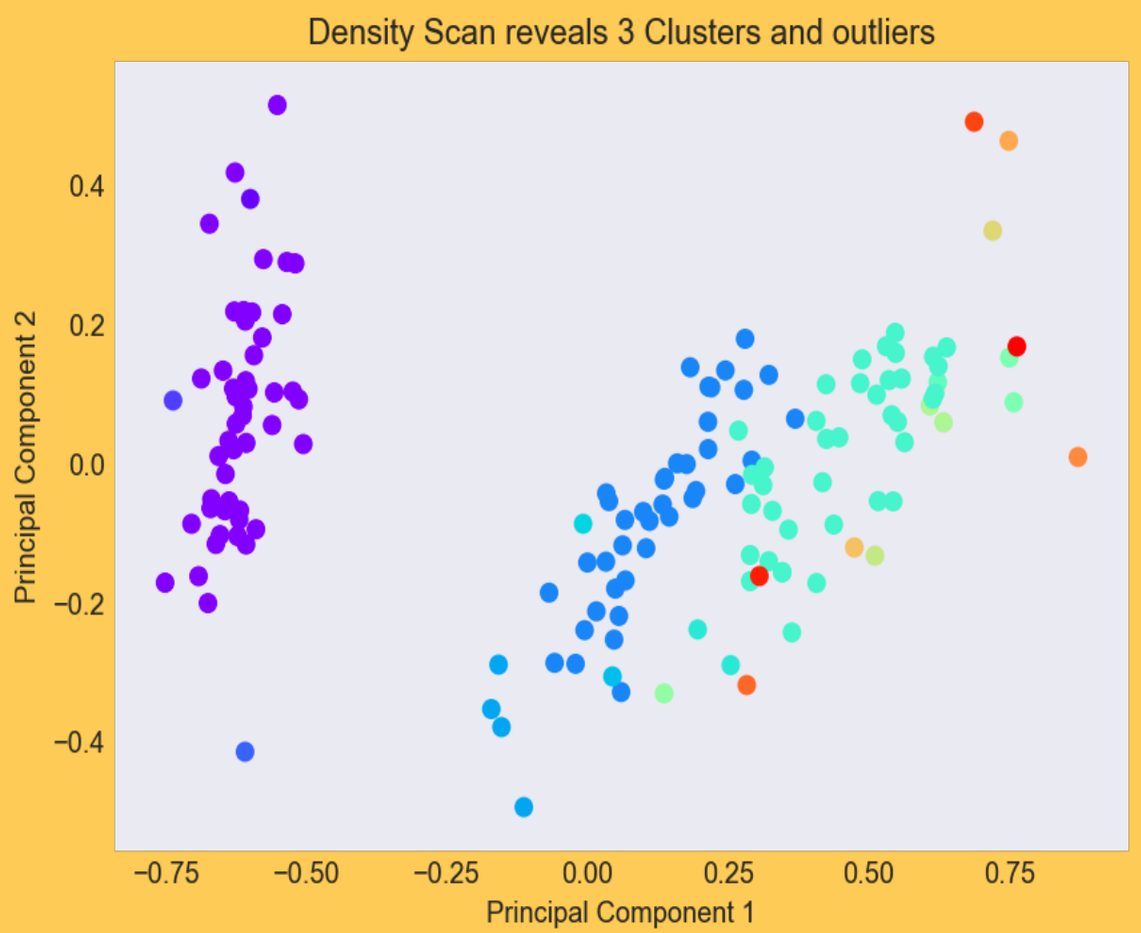
# 3 CENTROIDS IS NOT A LOT BETTER. . .



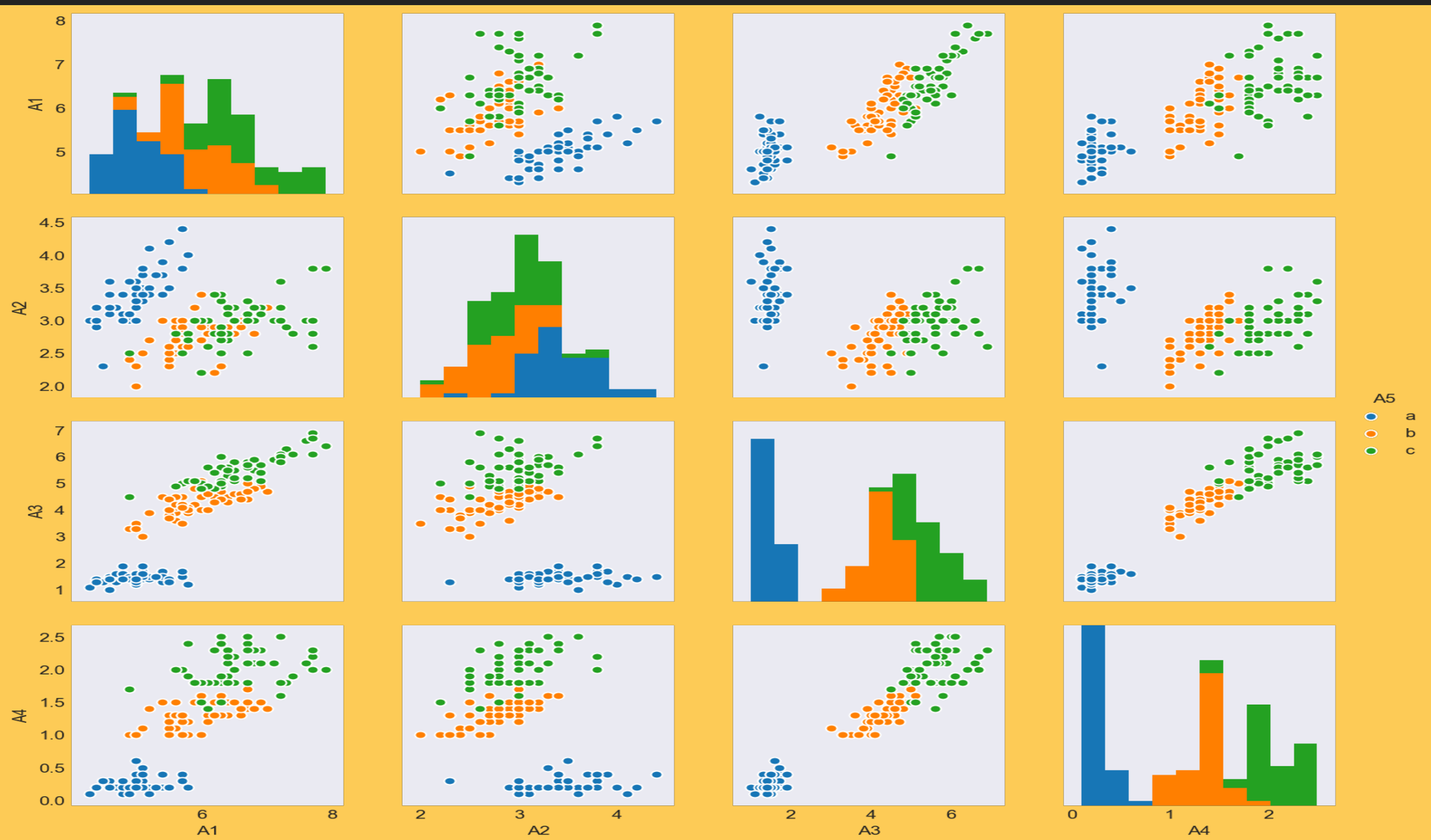



# DBSCAN BETTER BUT HAS OUTLIERS



# WHY K-MEANS DID POORLY



# SECTION 2

# LOGISTIC CLASSIFIER

- The more young children you are looking after and the more hungry you are, but the less alternative eating options in your area means a higher probability of you eating dinner at McDonalds tonight.

- More comprehensible model

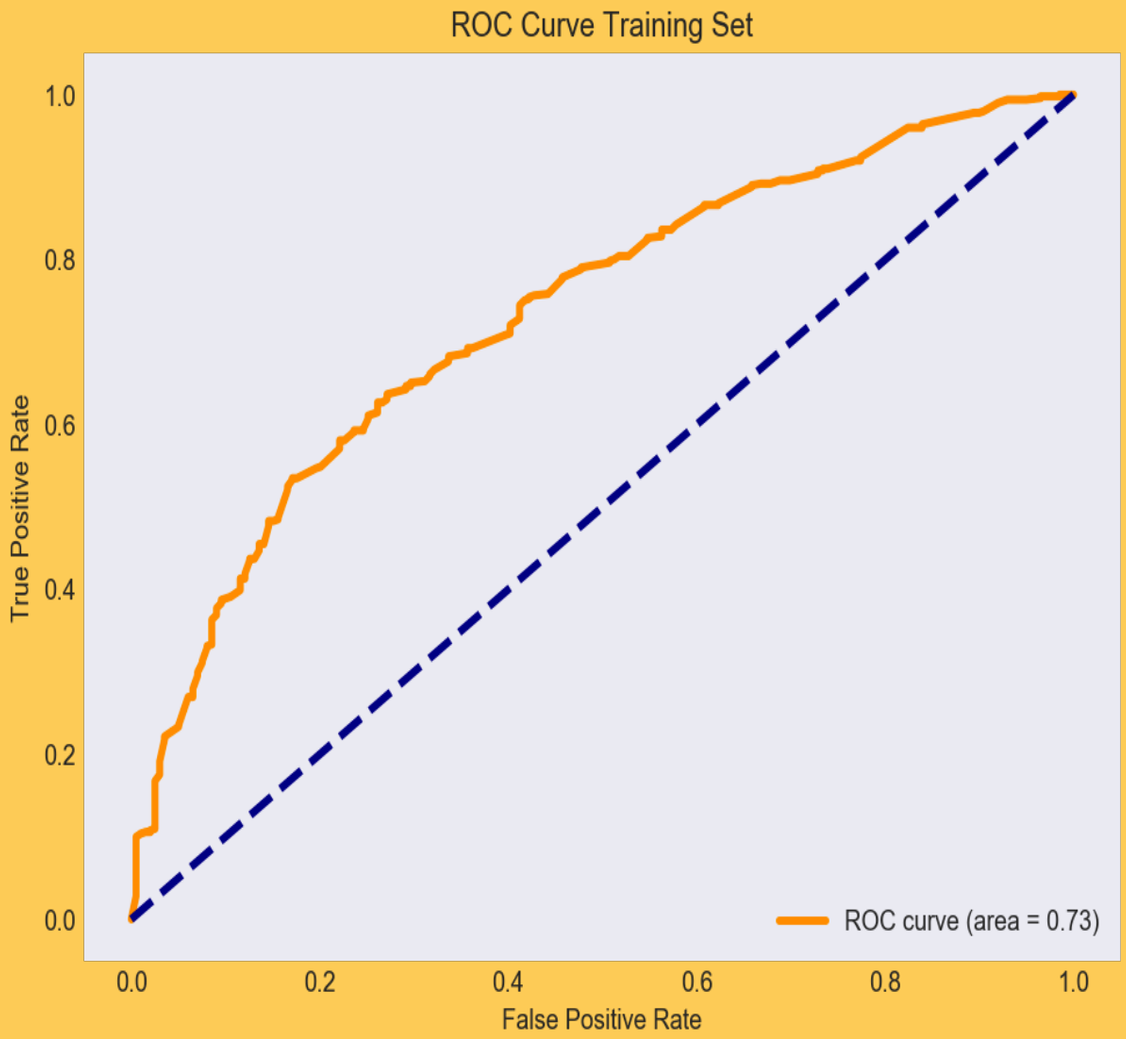
# BEST FEATURES

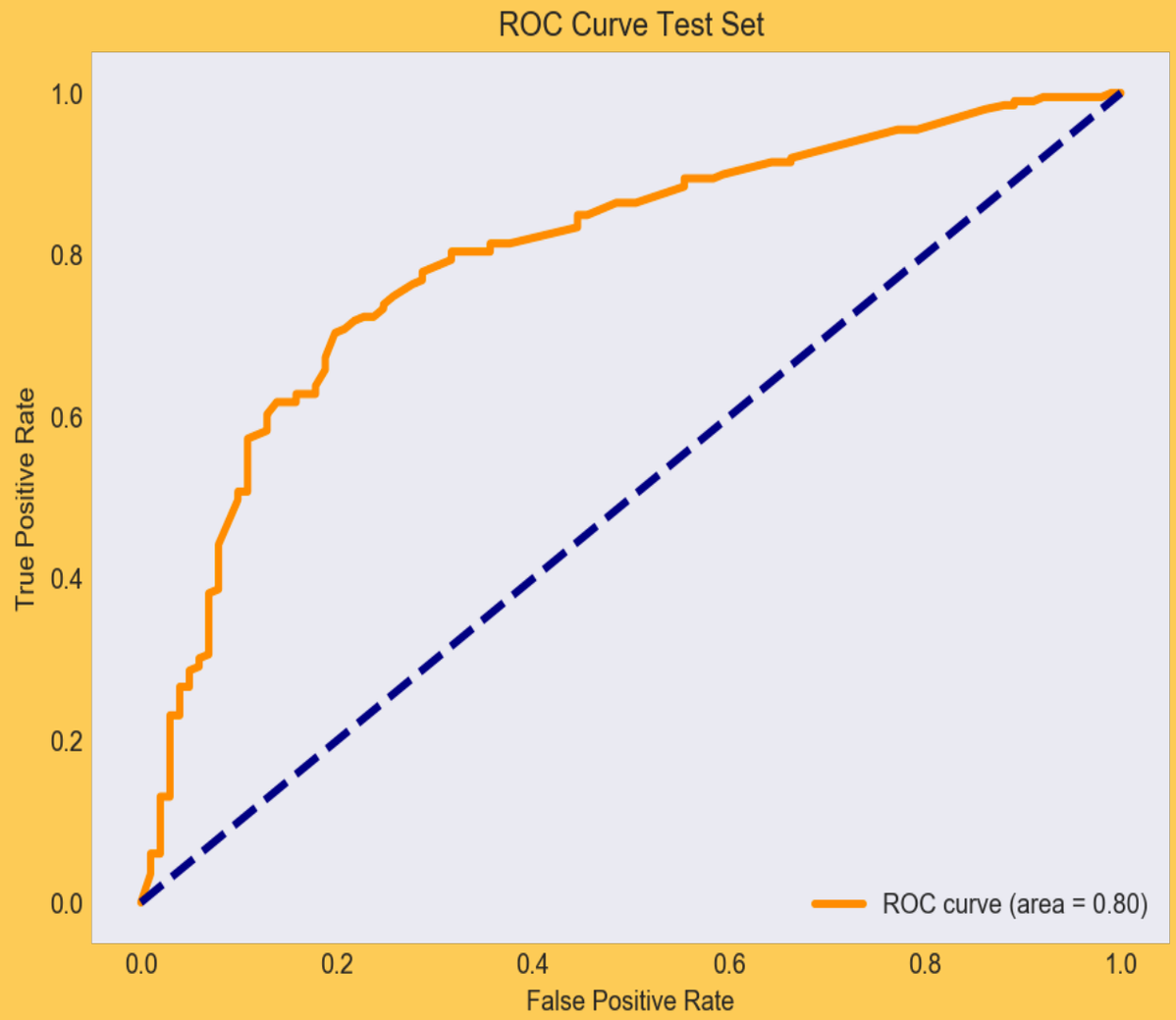
- Odds of getting into Class 1 over Class 0
- Holding other features constant

| Feature | Coefficient | Odds |
|---|---|---|
| A6 | 1.124984 | 3.08 |
| A7 | 0.453731 | 1.57 |
| A9 | 0.364034 | 1.44 |
| A10 | 0.113566 | 1.12 |

# 70-30 TRAIN-TEST SPLIT

## FOUR FACTOR MODEL



# KNN CLASSIFIER

- Residents of Glebe like residents of Newtown, Marrickville, Erskineville and Surry Hills are more likely to take public transport to the Central Business District

- Group into a class based on neighbors
- Also intuitive

# 70-30 TRAIN-TEST SPLIT

## FOUR FACTOR MODEL