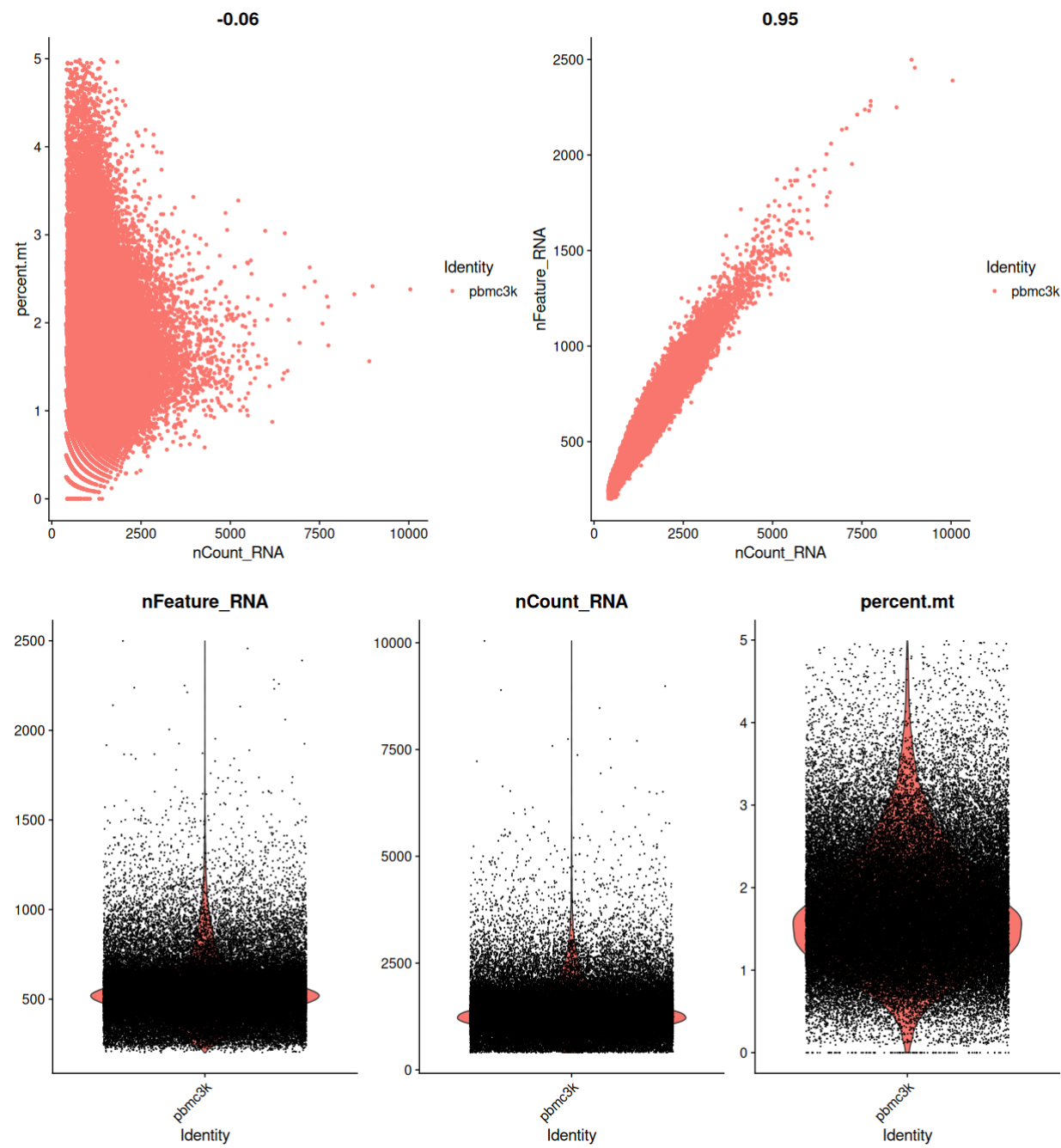
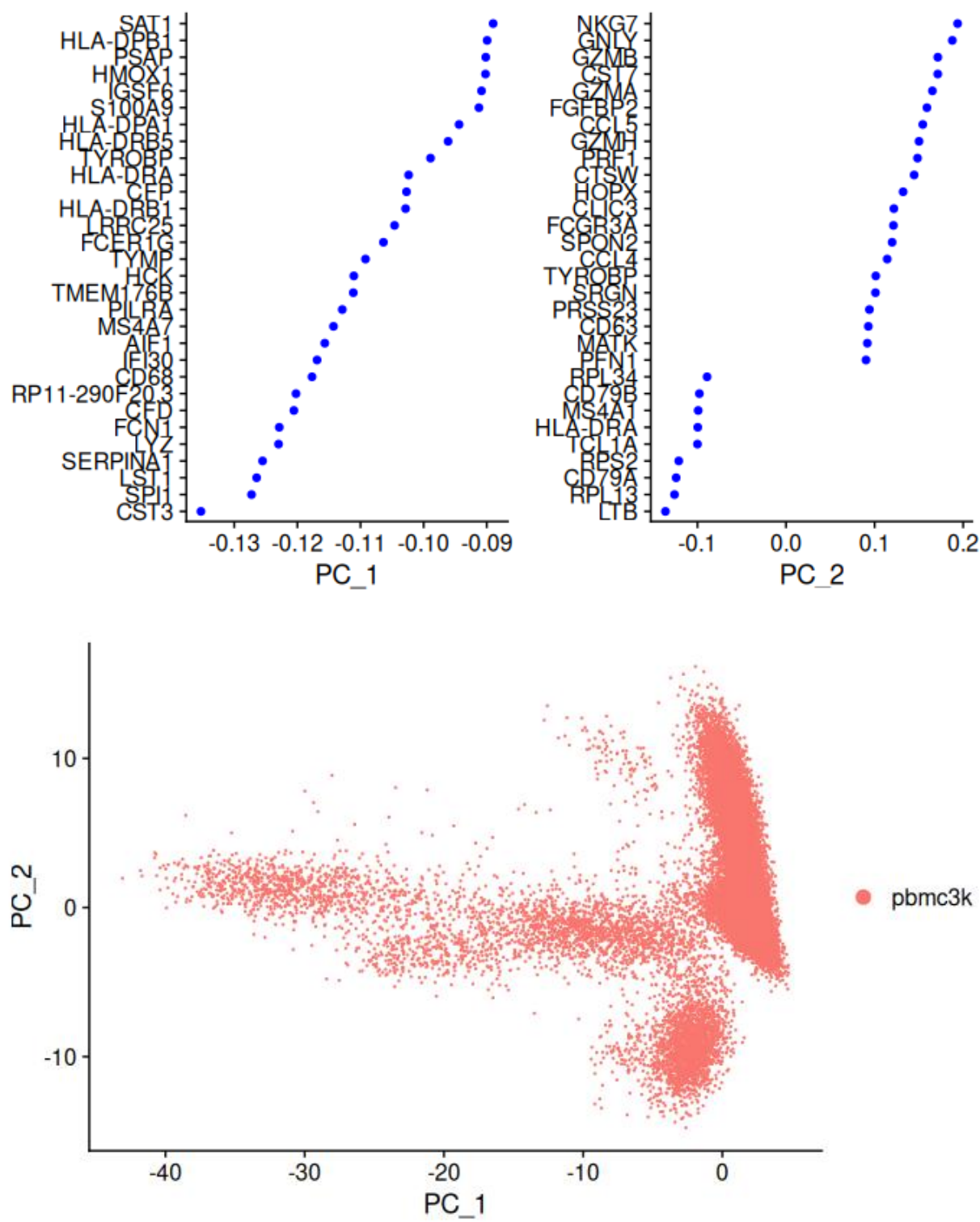


# Homework Problem 1

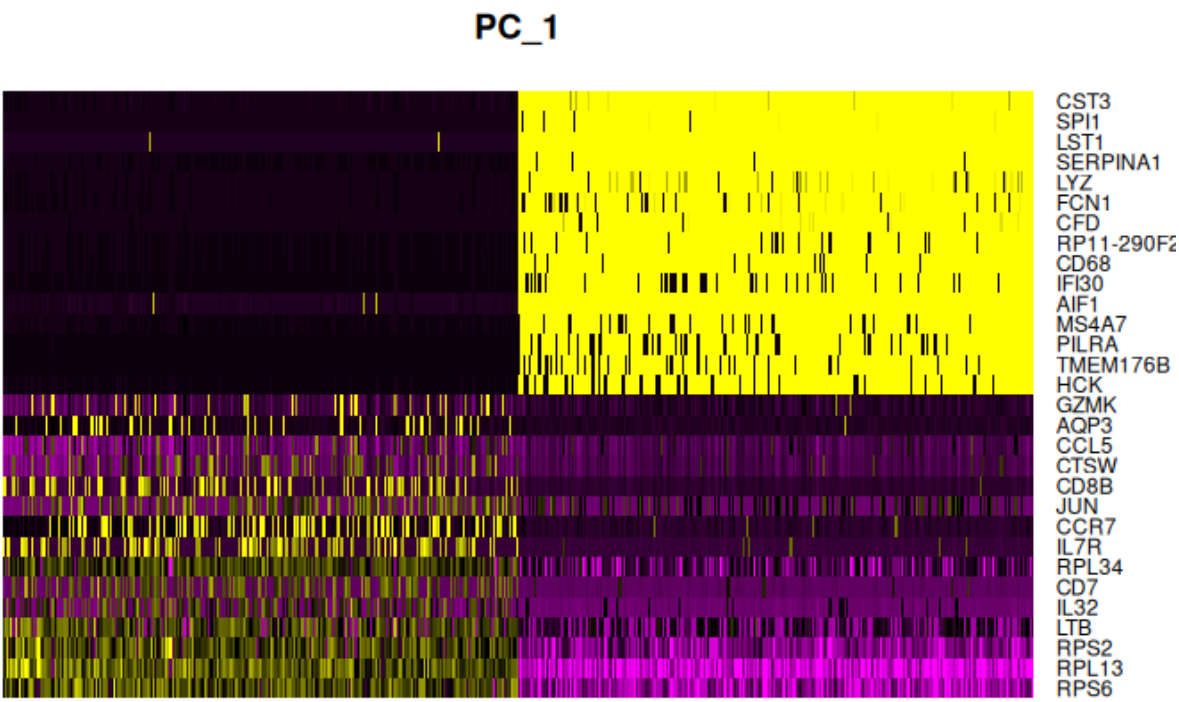
QC:



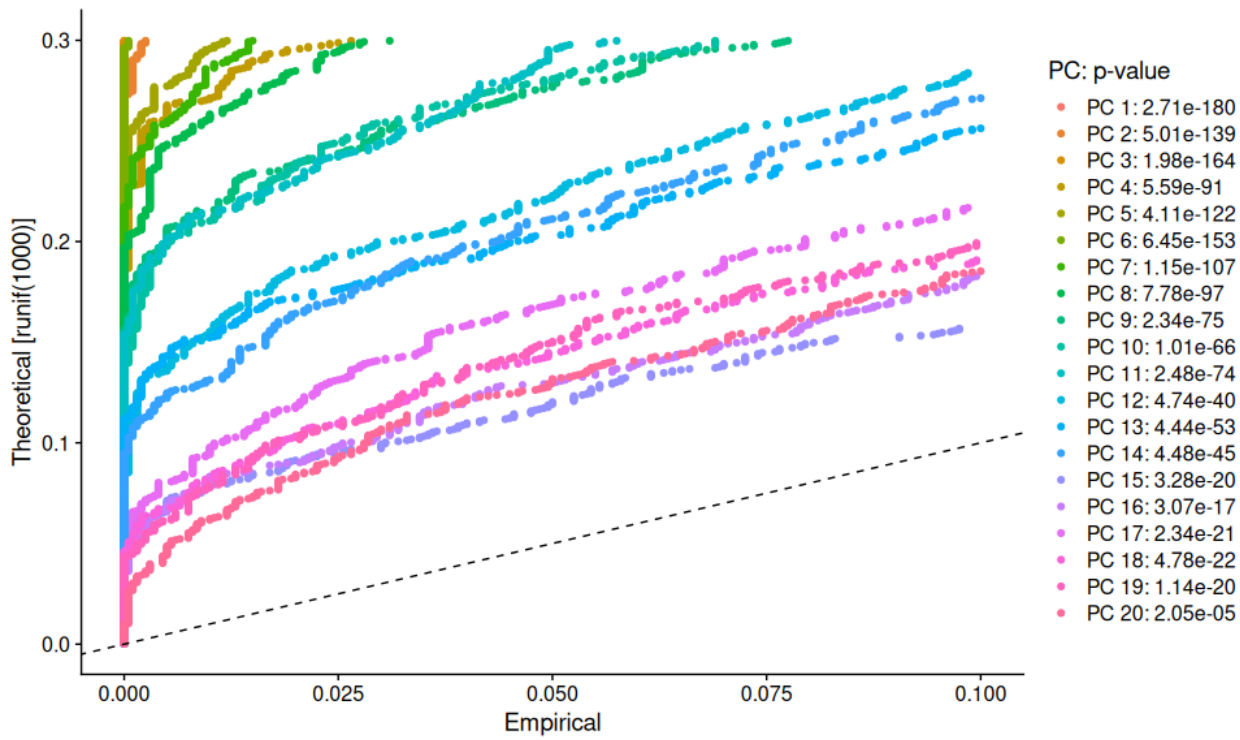
Linear dimensional reduction:



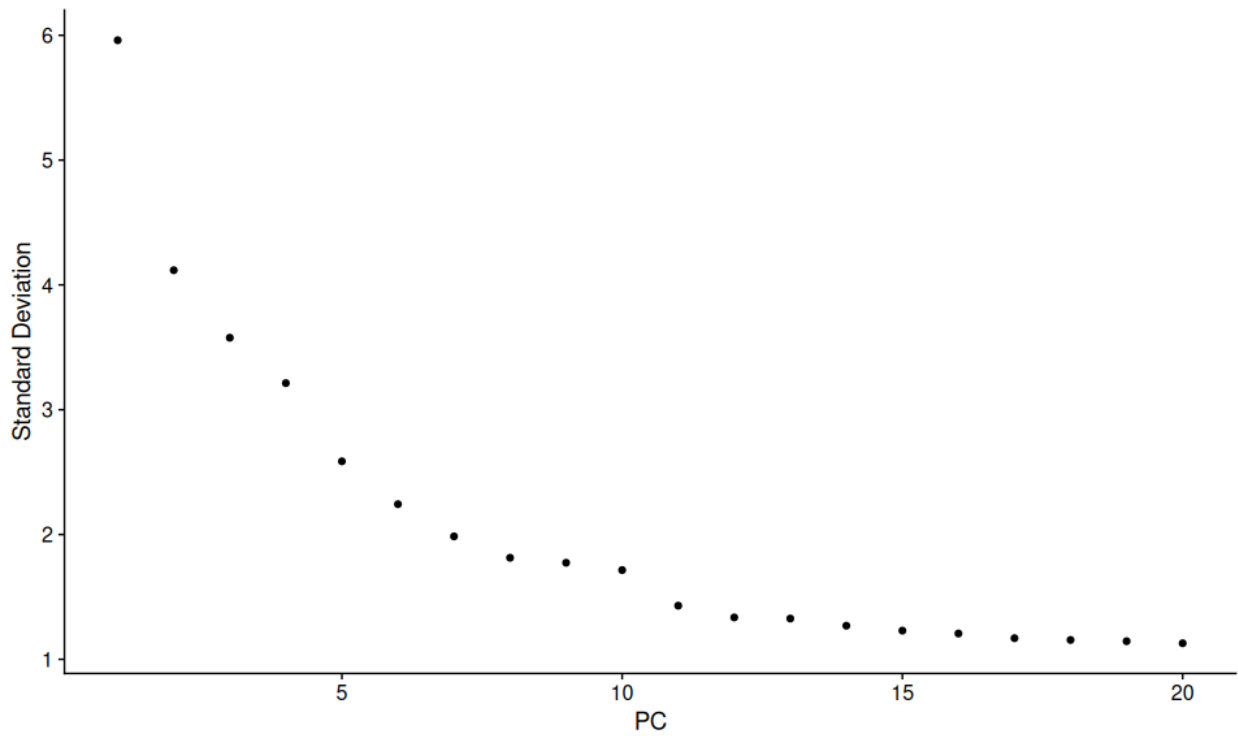
PC1:



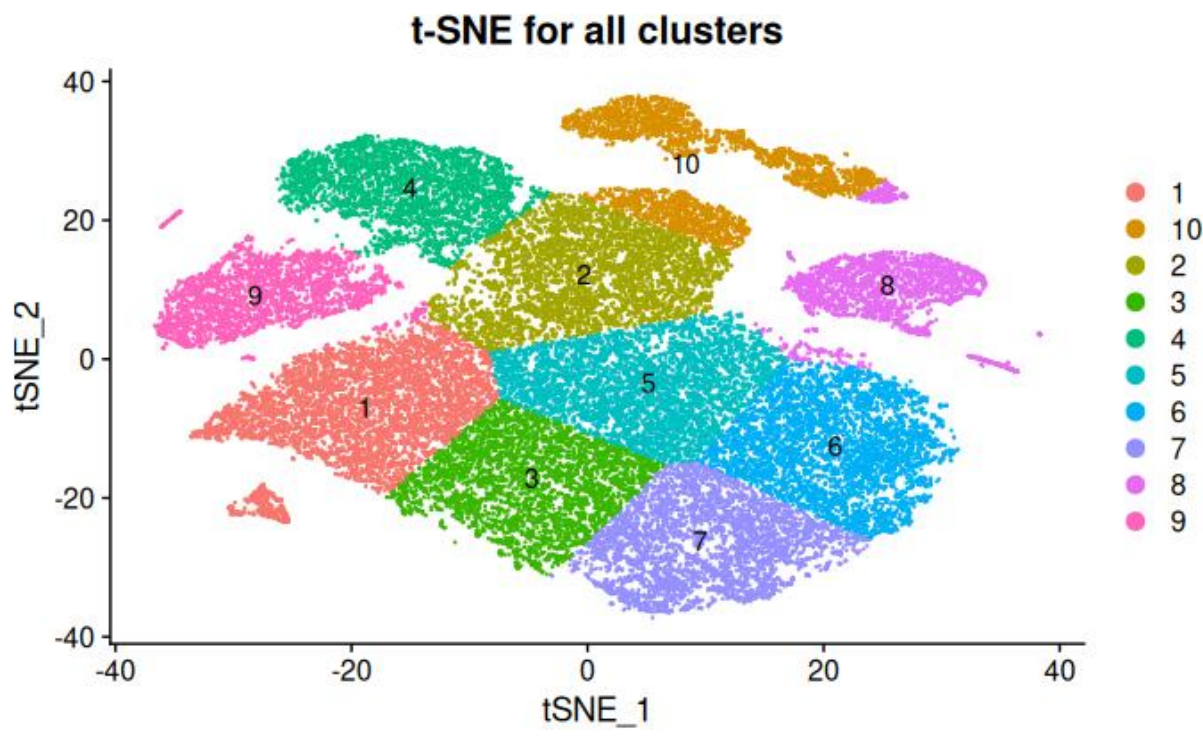
JackStrawPlot:



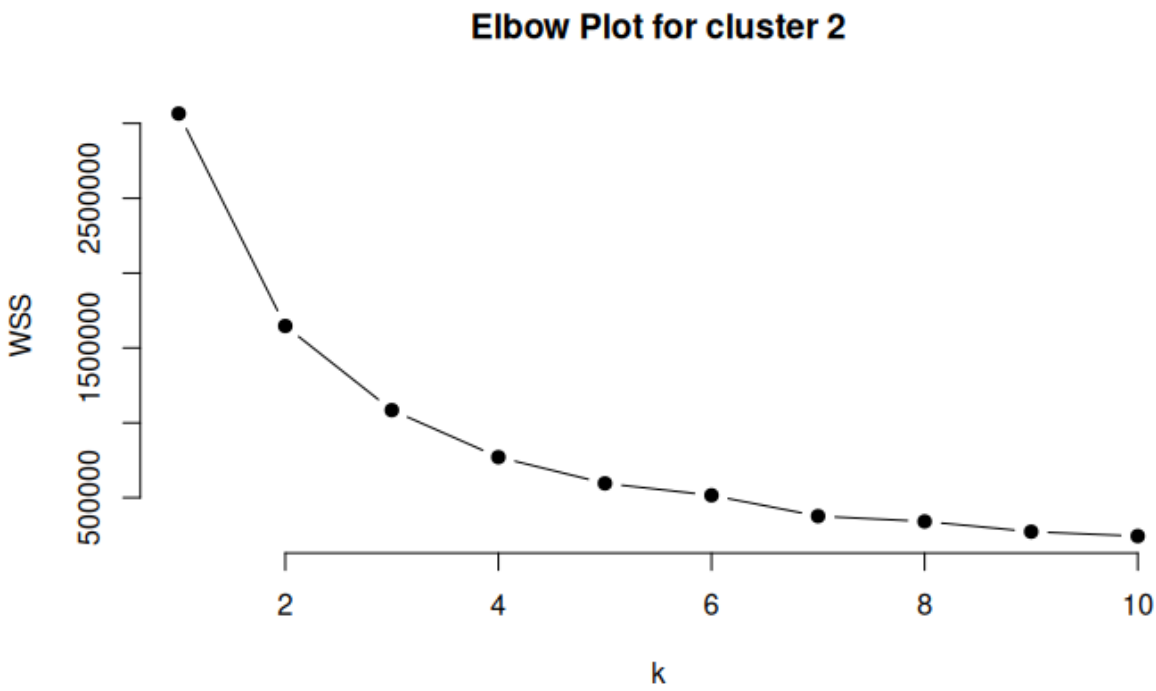
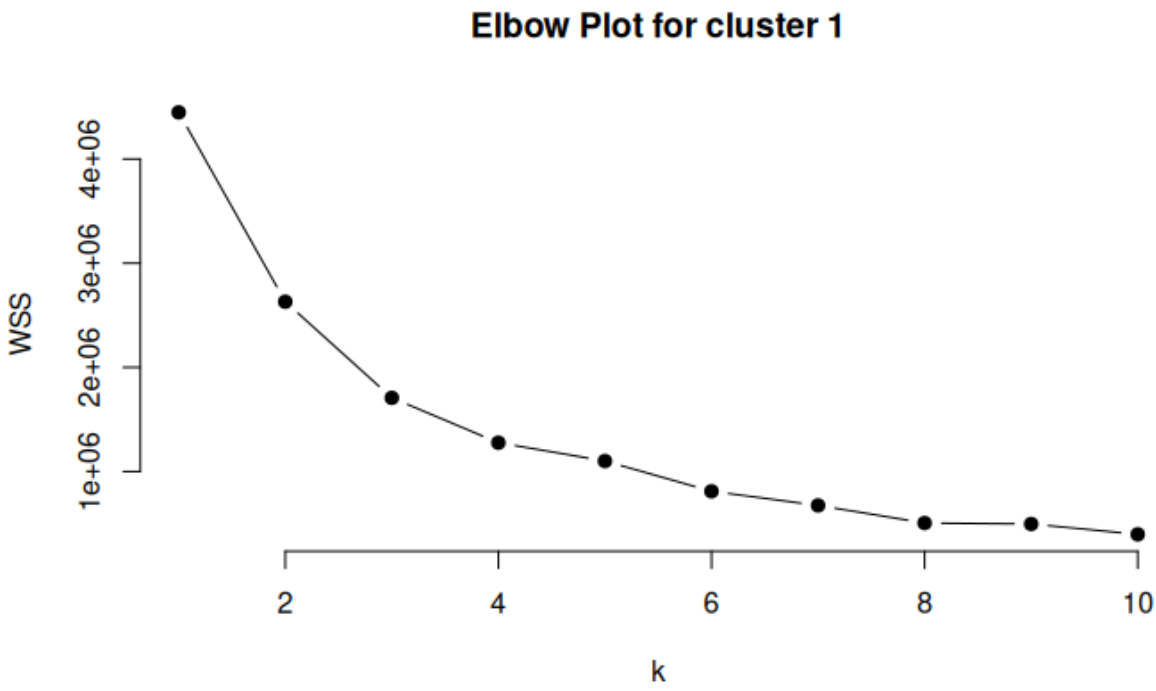
ElbowPlot:



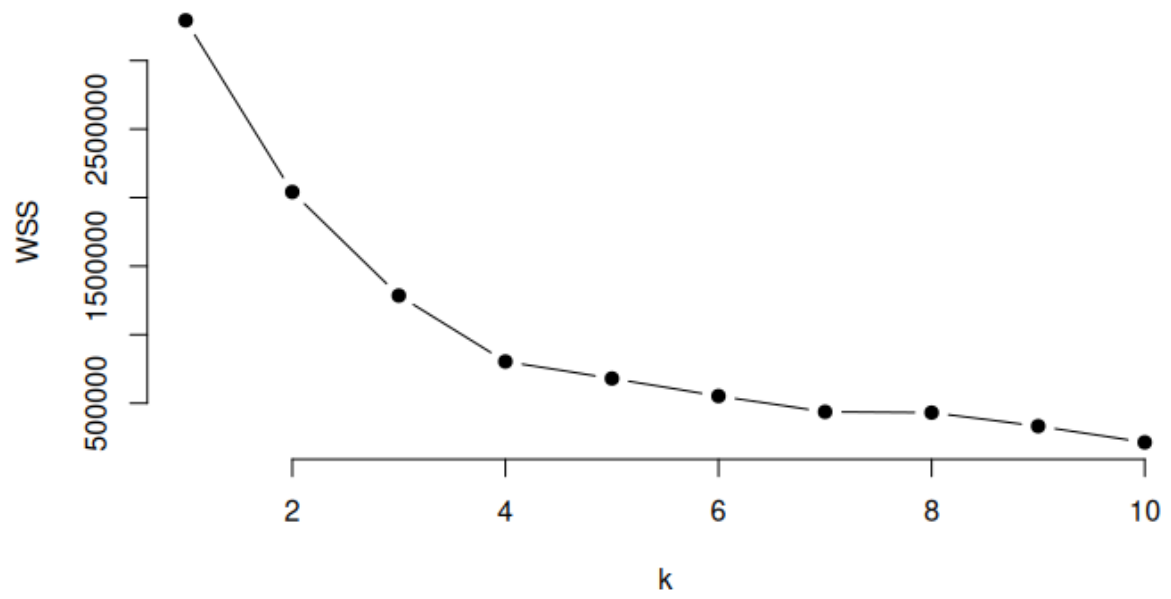
Clustering:



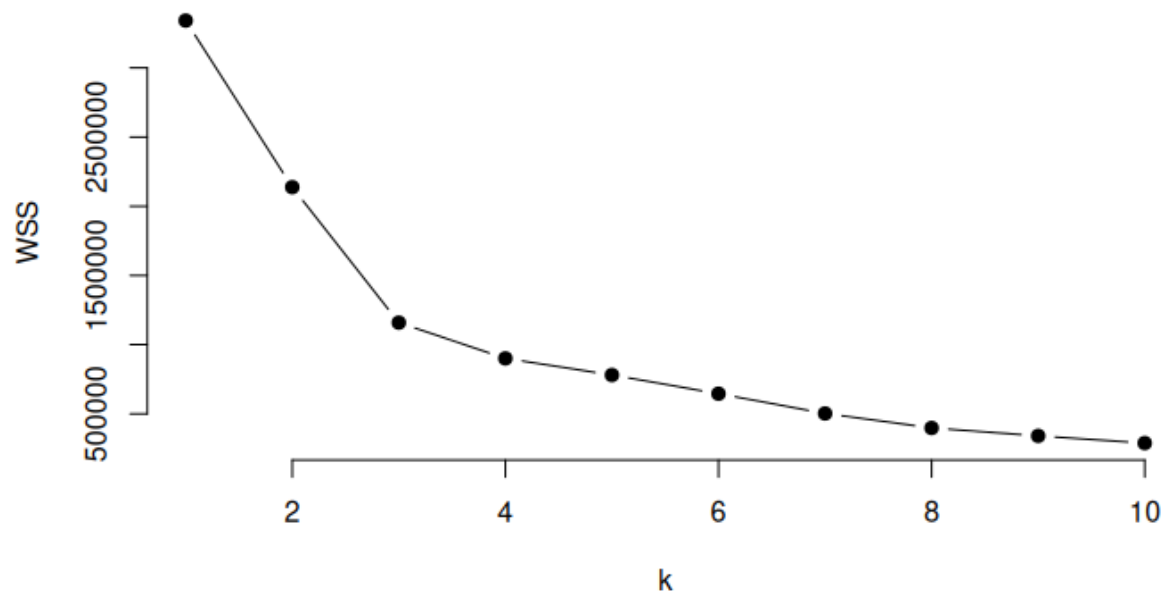
# Homework Problem 2



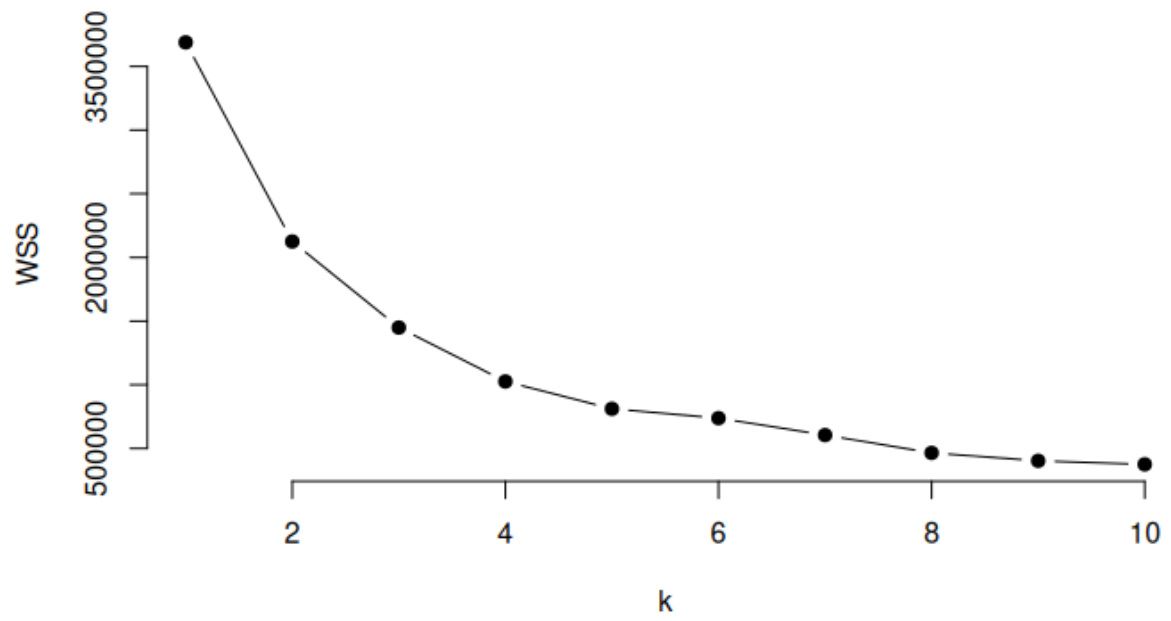
**Elbow Plot for cluster 3**



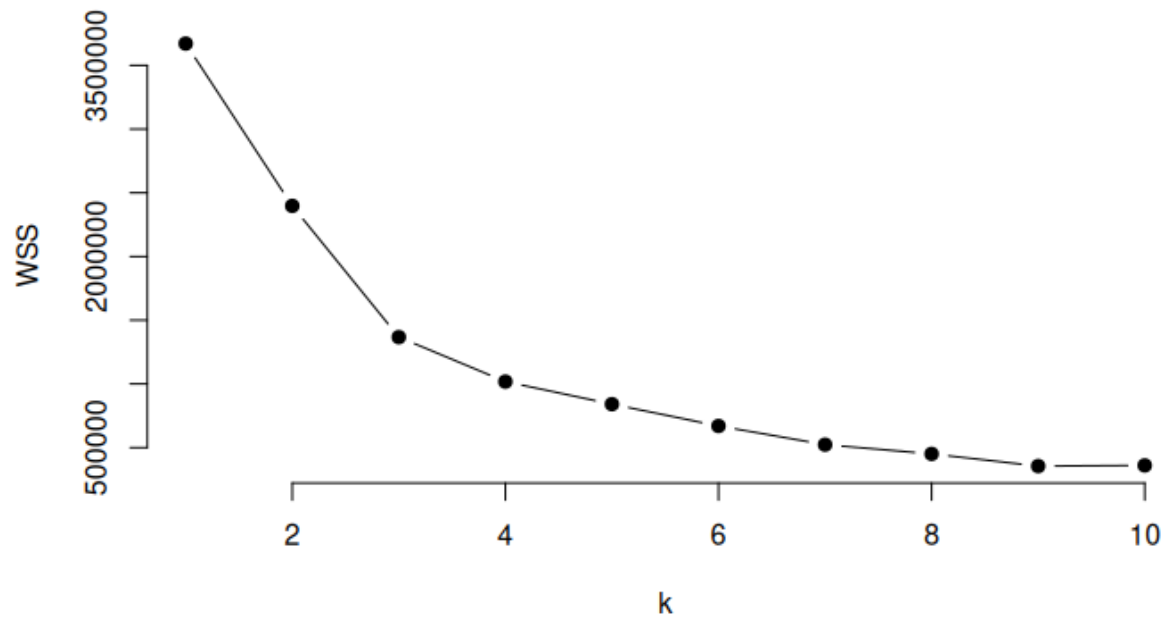
**Elbow Plot for cluster 4**



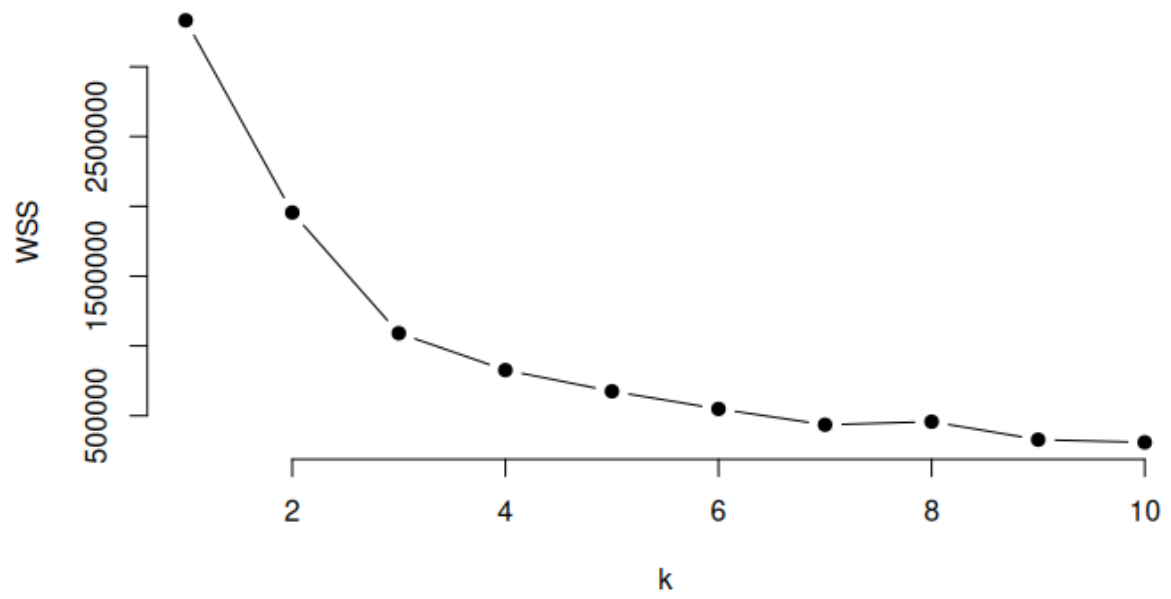
**Elbow Plot for cluster 5**



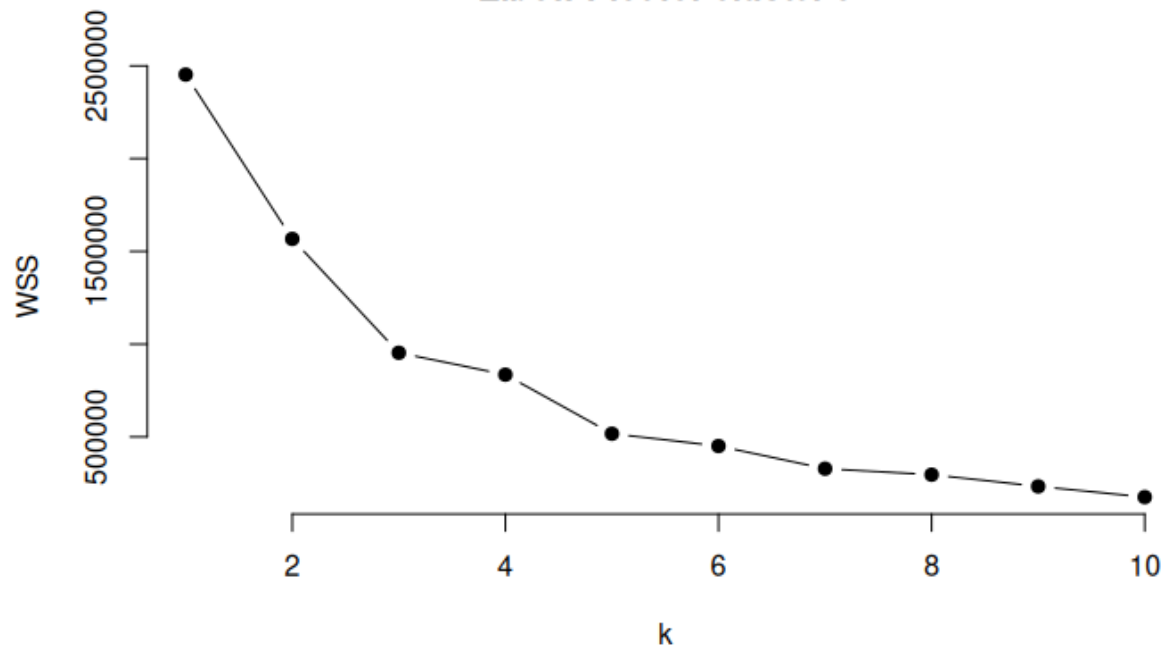
**Elbow Plot for cluster 6**



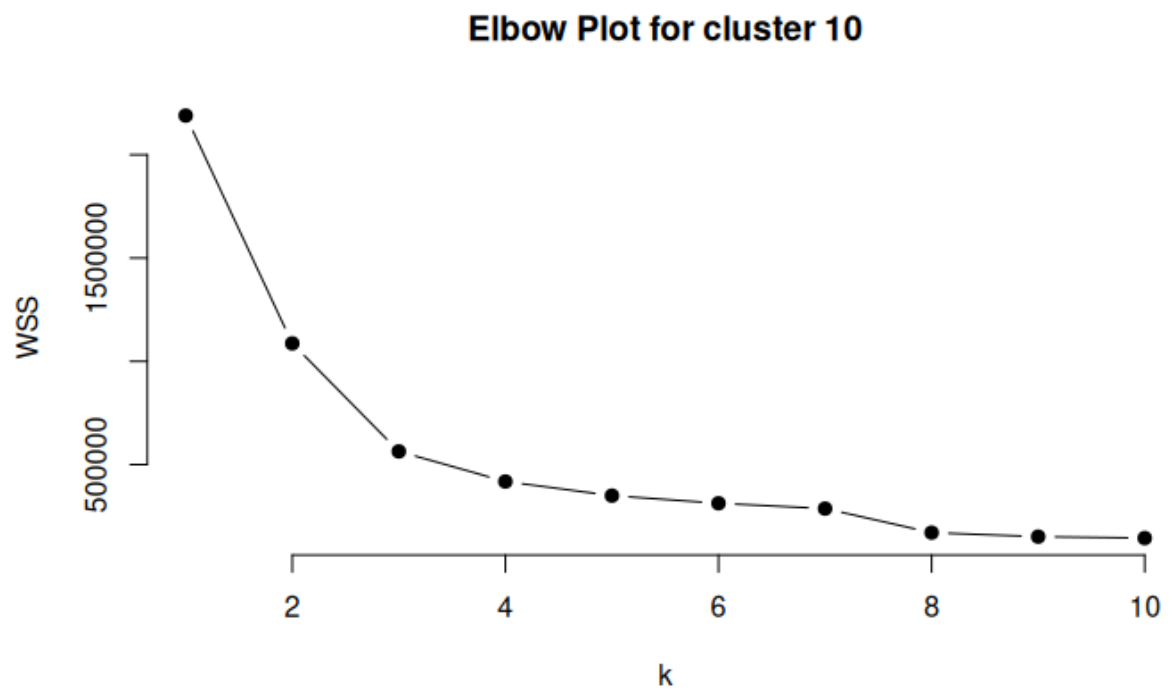
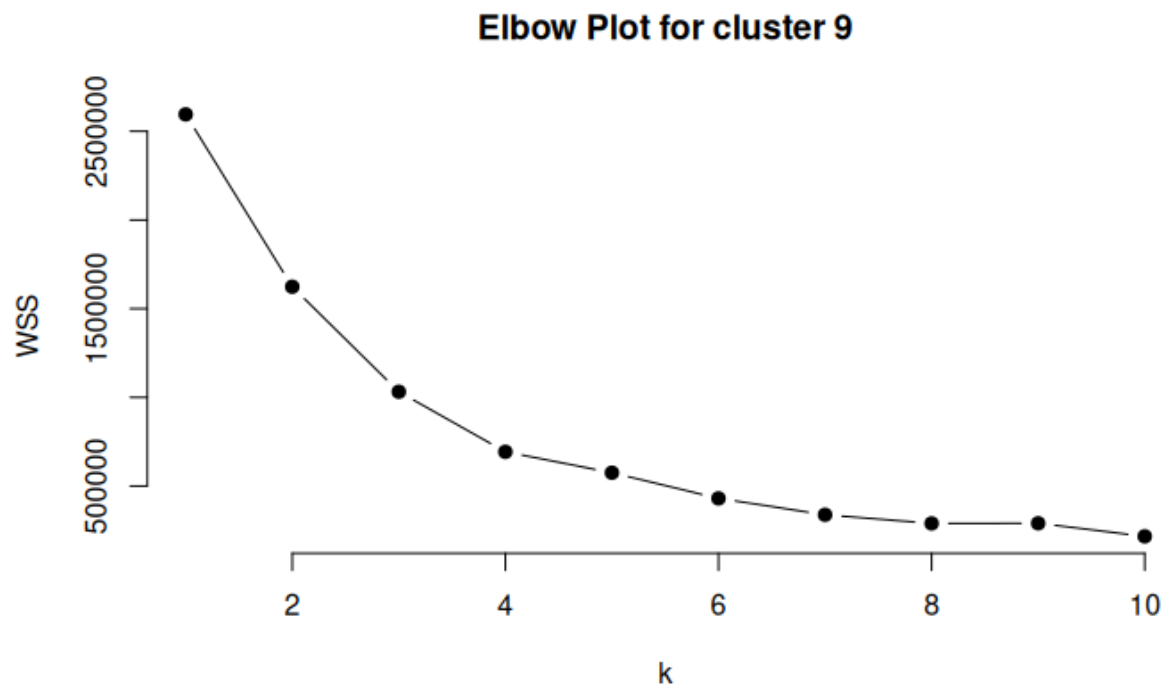
**Elbow Plot for cluster 7**



**Elbow Plot for cluster 8**

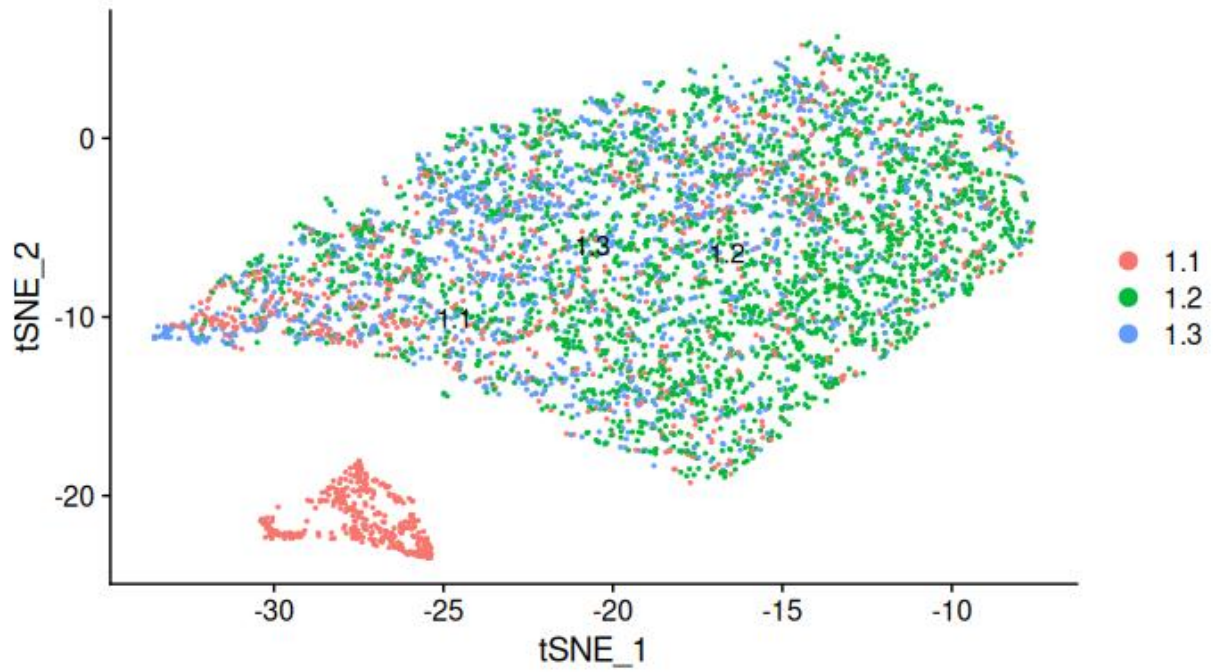




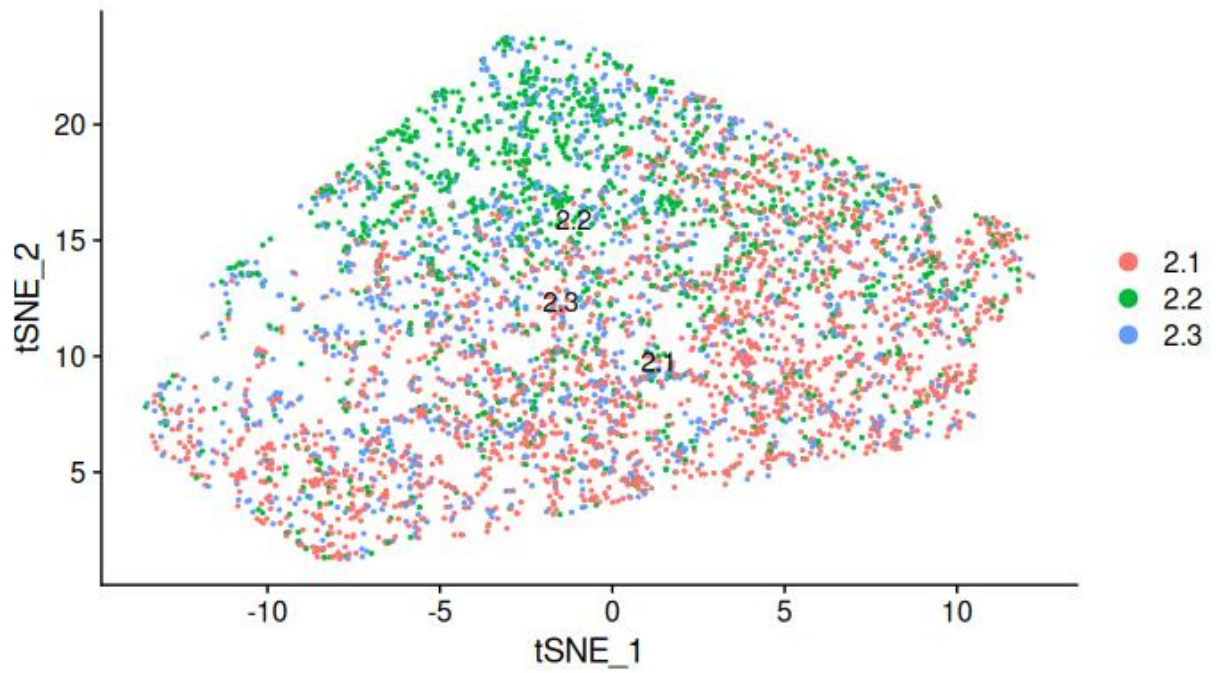


For all clusters optimal k-means seems to be about 3.

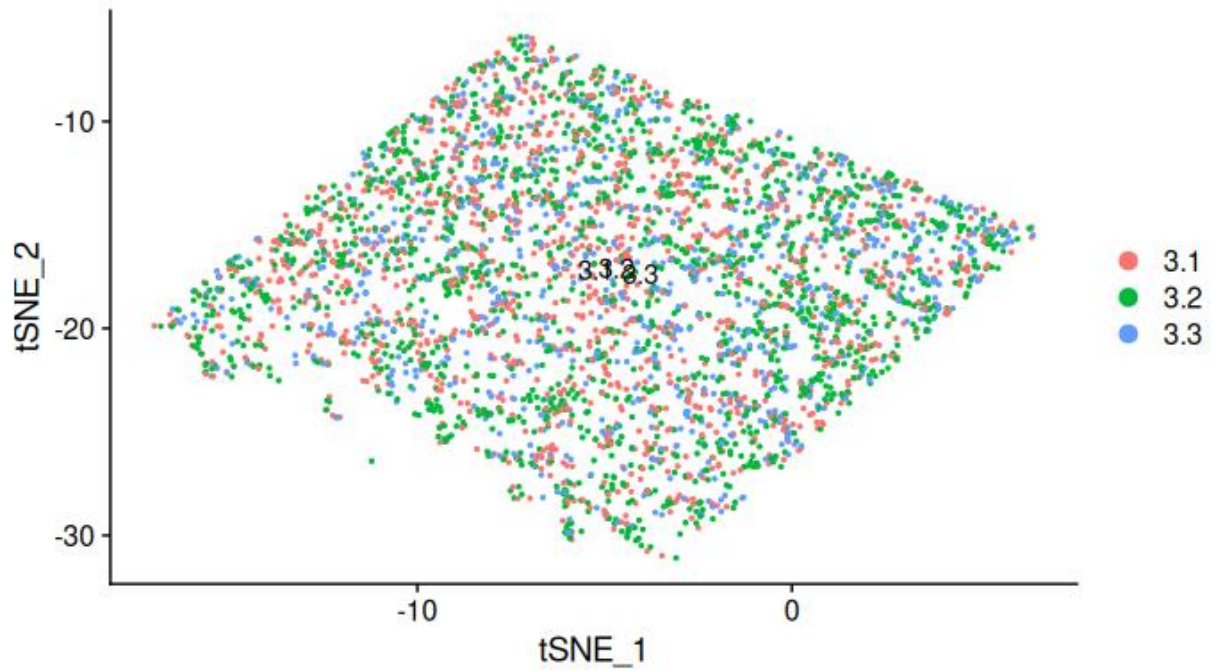
**t-SNE for cluster 1 with sub-clusters**



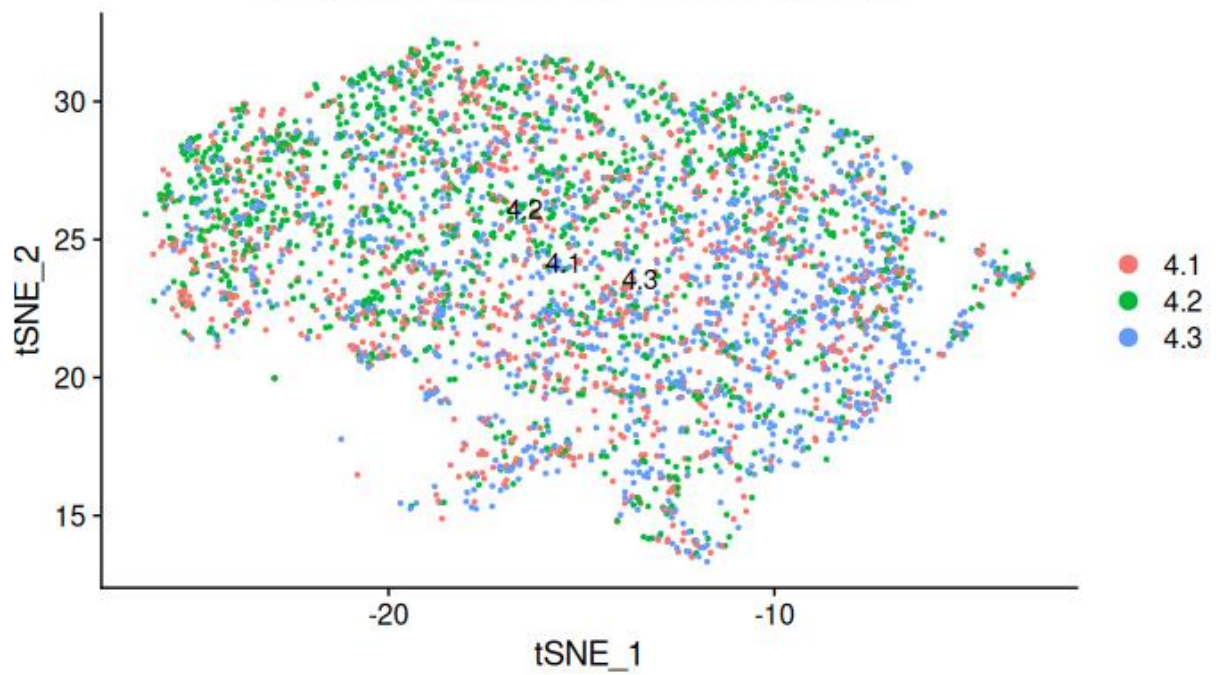
**t-SNE for cluster 2 with sub-clusters**



**t-SNE for cluster 3 with sub-clusters**

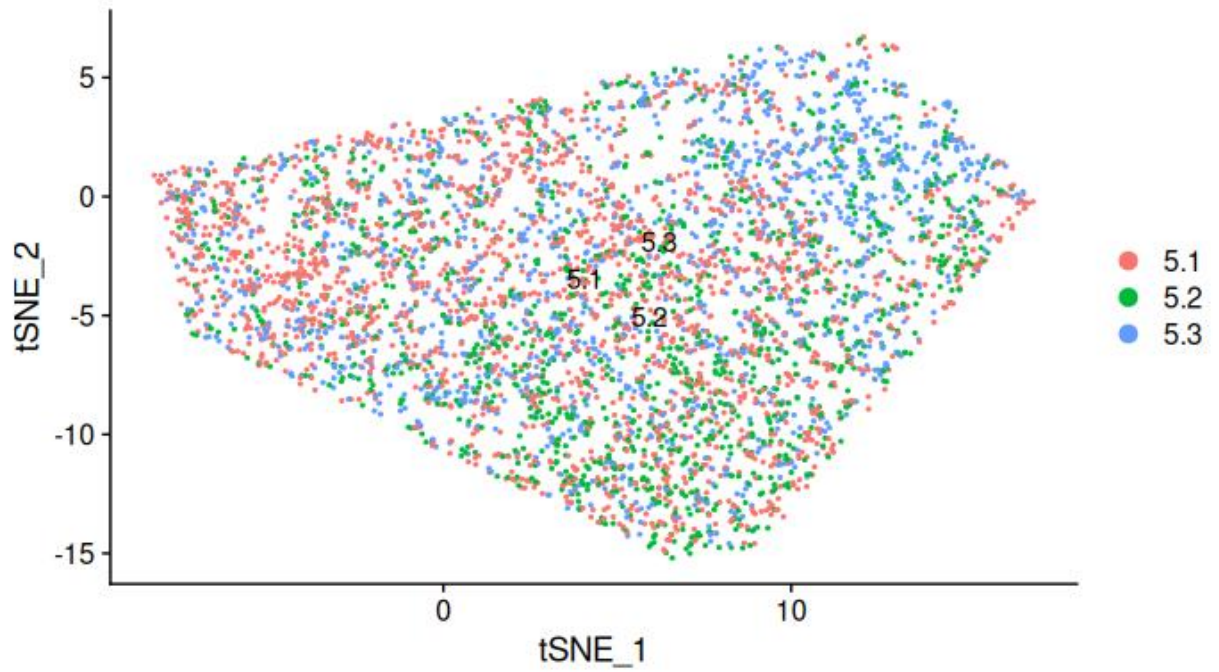


**t-SNE for cluster 4 with sub-clusters**

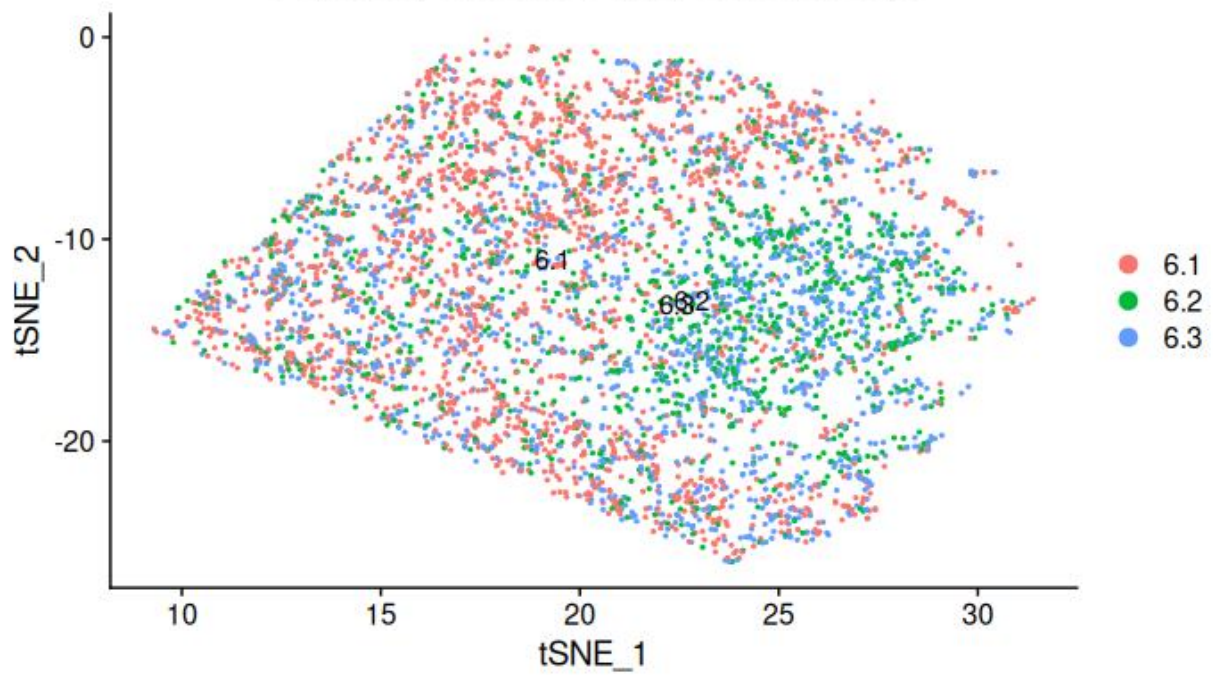




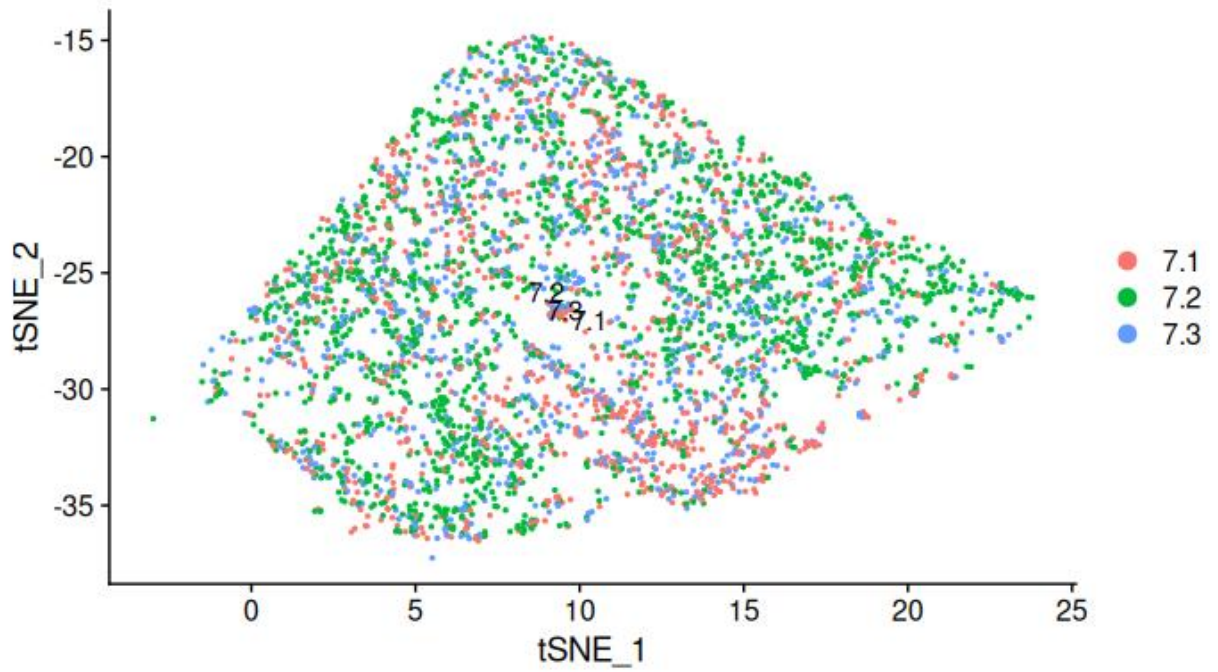
**t-SNE for cluster 5 with sub-clusters**



**t-SNE for cluster 6 with sub-clusters**



**t-SNE for cluster 7 with sub-clusters**



**t-SNE for cluster 8 with sub-clusters**

