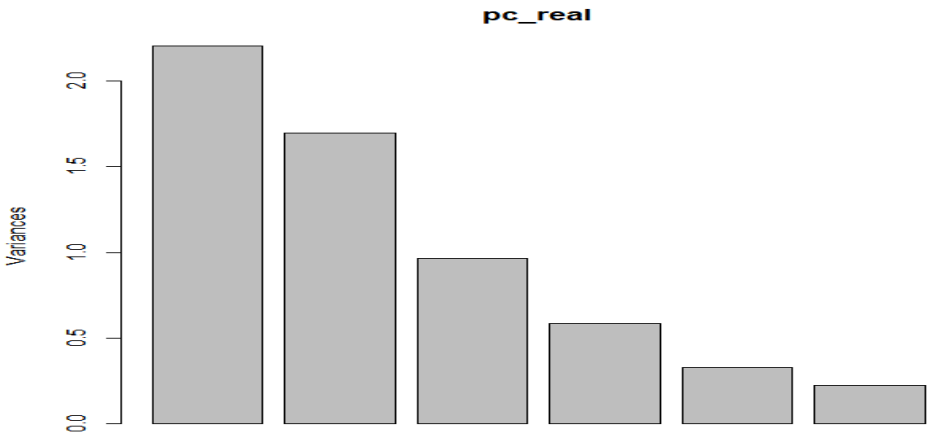
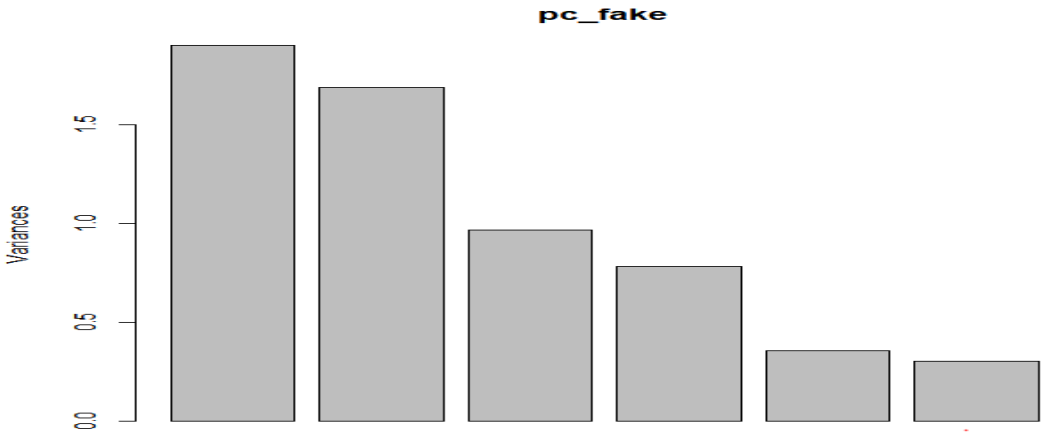
Question 3

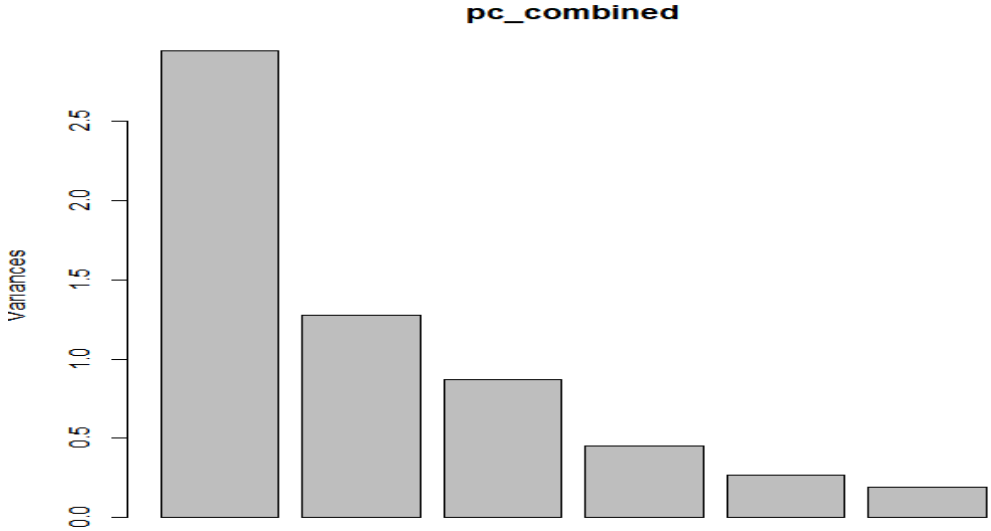
- Principal Component Analysis for first 100 real currency notes.



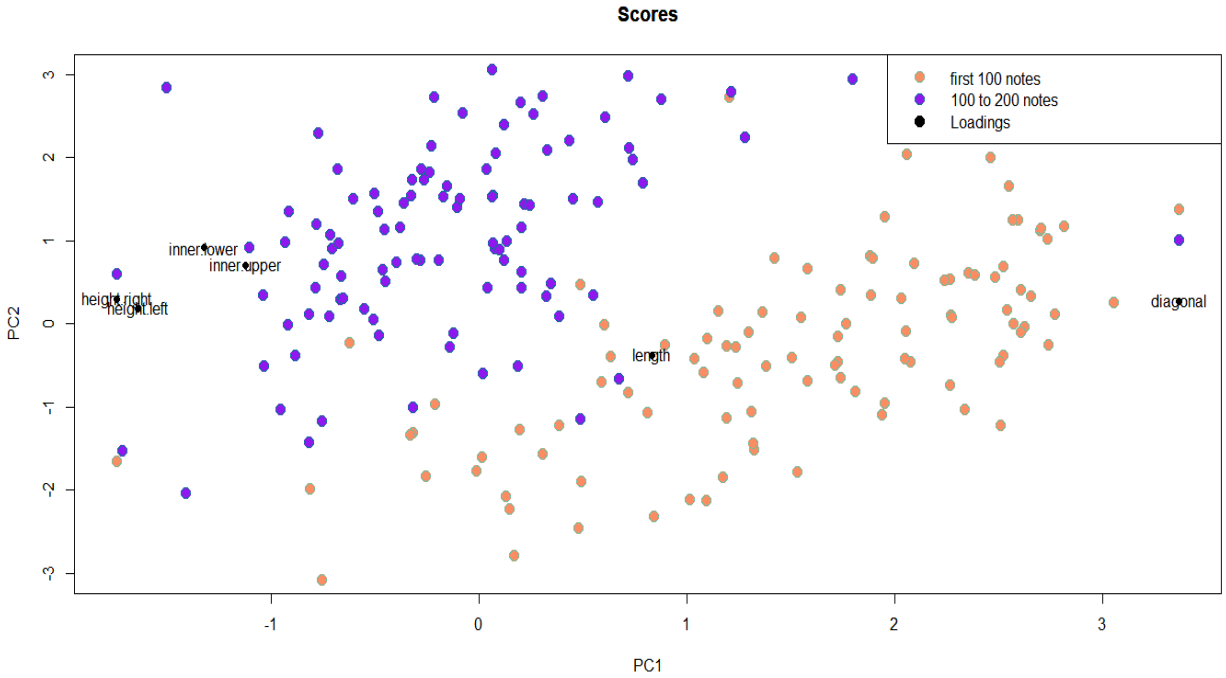
- Principal Component Analysis for first 100-200 fake currency notes in the data set.



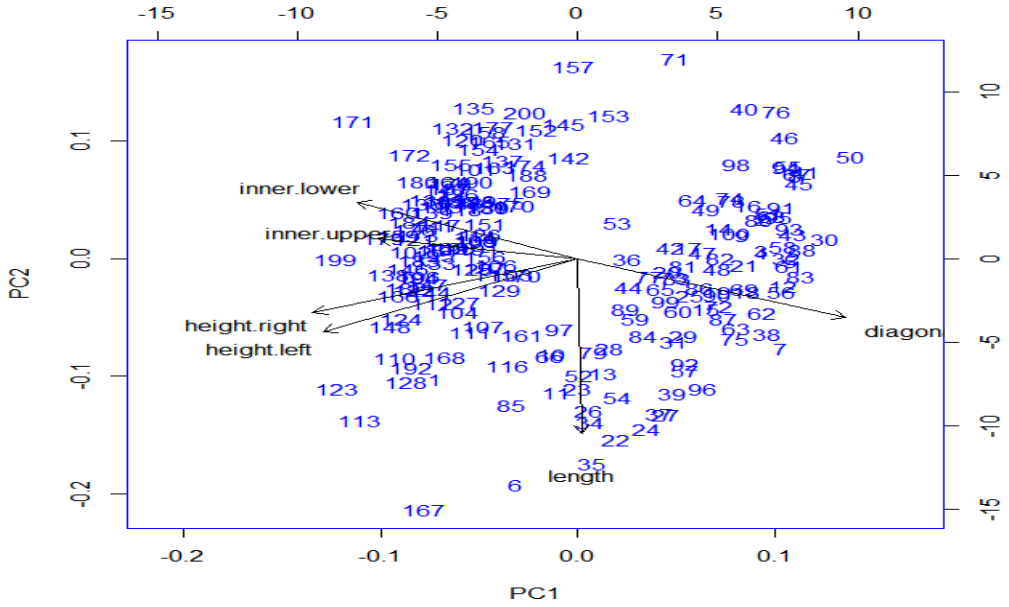
- Principal Component Analysis for Combined (all of the dataset).



- Combined Plot showing principal components of first 100(real) and 100-200(counterfeit) currency notes on a score plot. Also plotted are the loadings.



- Biplot for the data.



- Diagonal and length variables are positively correlated.
- We can see that from the biplot and score plot above the real notes (1-100) are close to length and diagonal vectors of the notes. Therefore, diagonal is the main variable that pertains to variation and is the main variable that separates real and counterfeit currency noted.

- We can also see that diagonal and inner.lower are opposite to each other and decisive in separating real and counterfeit notes.
- Real currency is close to diagonal and length vector whereas, counterfeit currency is close