

Line 24-25: Print summary breakdown of the principal components from the original dataset

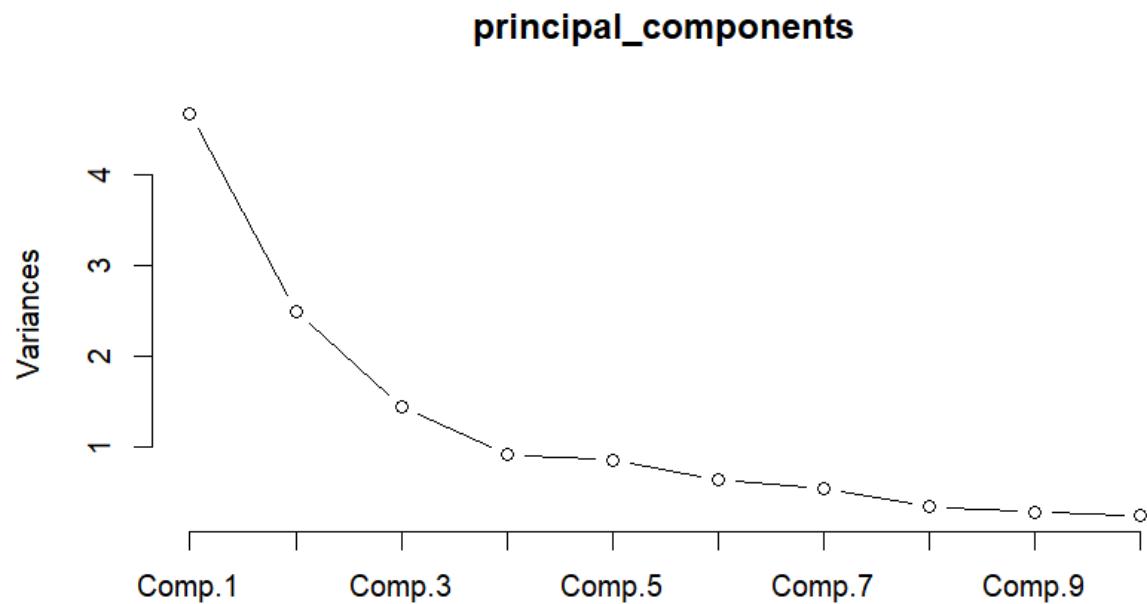
```
> summary(principal_components)
```

Importance of components:

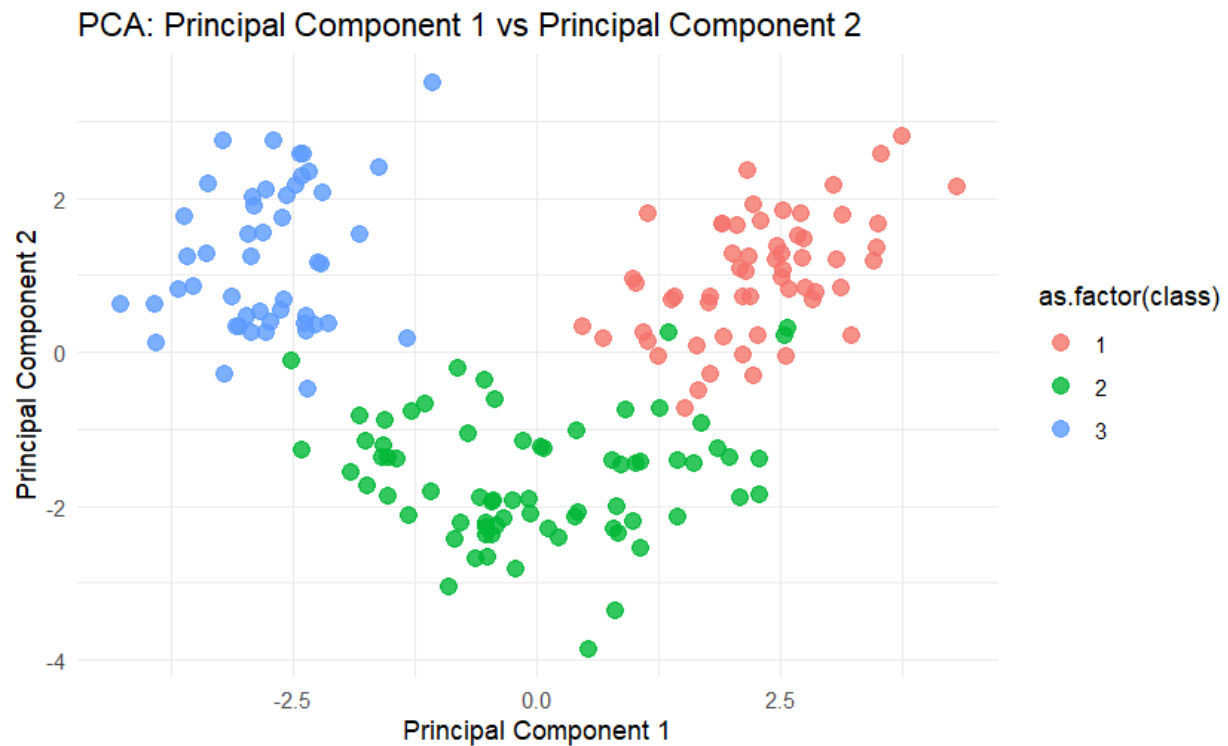
	Comp.1	Comp.2	Comp.3	Comp.4	Comp.5	Comp.6	Comp.7
Standard deviation	2.1628220	1.5815708	1.2055413	0.96148018	0.92829777	0.80302411	0.74295478
Proportion of Variance	0.3598307	0.1924128	0.1117946	0.07111109	0.06628744	0.04960367	0.04246014
Cumulative Proportion	0.3598307	0.5522435	0.6640381	0.73514919	0.80143663	0.85104030	0.89350044

	Comp.8	Comp.9	Comp.10	Comp.11	Comp.12	Comp.13
Standard deviation	0.59223207	0.53775461	0.49679842	0.47480542	0.41033745	0.322412350
Proportion of Variance	0.02697991	0.02224462	0.01898528	0.01734155	0.01295206	0.007996133
Cumulative Proportion	0.92048035	0.94272497	0.96171025	0.97905180	0.99200387	1.000000000

Line 26:



Line 29-32: The PCA breakdown for each of the 3 main classes



Line 36-42: The summary of the new dataset created without the 3 main classes

```
> summary(pca_reduced)
Importance of components:
      PC1      PC2      PC3      PC4      PC5      PC6      PC7      PC8      PC9
Standard deviation 2.1560 1.3175 1.0266 0.93908 0.86154 0.72996 0.67697 0.58344 0.51862
Proportion of Variance 0.4226 0.1578 0.0958 0.08017 0.06748 0.04844 0.04166 0.03095 0.02445
Cumulative Proportion 0.4226 0.5804 0.6762 0.75636 0.82384 0.87228 0.91394 0.94489 0.96934
      PC10     PC11
Standard deviation 0.47654 0.33195
Proportion of Variance 0.02064 0.01002
Cumulative Proportion 0.98998 1.00000
```

Line 46-91: Loop that trains each kNN model and prepares statistics to be output as tables afterward

Line 87: Print model 1 contingency table

Table: Contingency Table of Model 1

```
| 1| 2| 3|
|--:|--:|--:|
| 17| 0| 0|
| 0| 22| 0|
| 0| 1| 14|
```

Line 88: Print model 1 precision, recall, and f1 scores

Table: Precision/Recall/F1 for Model 1

Class	Precision	Recall	F1_Score
1	1.0000000	1.0000000	1.0000000
2	1.0000000	0.9565217	0.9777778
3	0.9333333	1.0000000	0.9655172

Line 90: Print model 2 contingency table

Table: Contingency Table of Model 2

1	2	3
19	1	0
0	18	0
0	0	16

Line 91: Print model 2 precision, recall, and f1 scores

Table: Precision/Recall/F1 for Model 2

Class	Precision	Recall	F1_Score
1	0.95	1.0000000	0.974359
2	1.00	0.9473684	0.972973
3	1.00	1.0000000	1.000000

Comparison: I believe model 2 is better because each class has a closer to even distribution in model 2 than in model 1 for the contingency tables, precision stats, recall stats, and f1 score stats.