

## Breast Cancer PCA Assignment Rubric

Criterion	Full Credit	Partial Credit	No Credit	Points
1. PCA on numeric variables	Correctly selects numeric columns, runs PCA (scaled), and reports number of PCs.	PCA run but includes small errors (non-numeric columns, missing scaling, or unclear PCs).	No PCA or incorrect implementation.	1
2. Variance explained plot + PC1+PC2	Produces clear scree/bar plot and correctly reports combined variance (PC1+PC2).	Plot present but unclear labeling or missing PC1+PC2 values.	No variance plot or incorrect values.	1
3. PCA point plot colored by diagnosis	Scatterplot of PC1 vs PC2 with proper colors by diagnosis and interpretation of separation.	Plot generated but lacks clear labeling or incomplete interpretation.	No PCA scatterplot or irrelevant plot.	1
4. Top 5 contributors to PC1 (positive)	Correctly identifies top 5 variables with strongest positive loadings in PC1.	Lists fewer or mixes directions, but mostly correct.	No loadings or incorrect variables.	1
5. Heatmap of top 10 most variable attributes + interpretation	Computes top 10 variable features, creates colored heatmap by diagnosis, provides ≤5-sentence interpretation of patterns.	Heatmap or interpretation present but incomplete or minor errors.	No heatmap or missing interpretation.	2

Total Points: 6