SPOT QUESTION FOR LINEAR DISCRIMINANT ANALYSIS

Perform experiments for the LDA code developed for regular question by modifying the following parameters:

Control Parameter	Description
Train-Test Split Ratio	Proportion of training and testing data
Number of Selected Features	Number of features used for classification
Solver Type	Svd, lsqr, eigen

Sample Observation Table

Experiment No	Train-Test Split	No. of Features	Solver	Accuracy	Observation
1	70:30	5	svd		
2	70:30	10	svd		
3	80:20	10	svd		
4	80:20	15	lsqr		
5	80:20	20	eigen		

Analytical Question

- Which parameter configuration gives the highest accuracy?
- How does the number of features affect classification performance?
- Which LDA solver performs best for this dataset?
- Does increasing the training data improve performance?

SPOT QUESTION FOR PRINCIPAL COMPONENT ANALYSIS

Perform experiments for the PCA code developed for regular question by modifying the following parameters:

Control Parameter	Description
Number of Principal Components	Number of features retained after PCA
Variance Retained	Percentage of variance preserved
Standardization	Whether features are normalized before PCA

Sample Observation Table

Experiment	No. of Principal Components	Variance Retained	Standardization	Reconstruction Error	Observation
1	2	60%	Yes		
2	5	75%	Yes		
3	10	90%	Yes		
4	15	95%	Yes		
5	20	98%	No		

Analytical Question

- How does increasing the number of principal components affect information preservation?
- At what point does adding more components produce diminishing returns?
- How does standardization influence PCA performance?
- What is the minimum number of components required to retain 90% of variance?