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Project 3

Range shrinkage value is [0 , 0.9] which has step is 0.1
The outputs is list below, then the best performance is
shrinkage = 0.1
score = 0.9797297297297297

The shrinkage value is : 0.0
The LDA average score is : 0.972972972972973
The shrinkage value is : 0.1
The LDA average score is : 0.9797297297297297
The shrinkage value is : 0.2
The LDA average score is : 0.9797297297297297
The shrinkage value is : 0.30000000000000004
The LDA average score is : 0.9731507823613087
The shrinkage value is : 0.4
The LDA average score is : 0.9534139402560455
The shrinkage value is : 0.5
The LDA average score is : 0.9534139402560455
The shrinkage value is : 0.6000000000000001
The LDA average score is : 0.9534139402560455
The shrinkage value is : 0.7000000000000001
The LDA average score is : 0.9601706970128023
The shrinkage value is : 0.8
The LDA average score is : 0.9534139402560455
The shrinkage value is : 0.9
The LDA average score is : 0.9466571834992887

Range neighbor value is [3, 21] which has step is 2
The outputs is list below, then the best performance is
shrinkage = 13
score = 0.9601706970128023

The neighbor value is : 3
The KNN average score is : 0.9532361308677099
The neighbor value is : 5
The KNN average score is : 0.9466571834992887
The neighbor value is : 7
The KNN average score is : 0.9466571834992887
The neighbor value is : 9
The KNN average score is : 0.9534139402560455
The neighbor value is : 11
The KNN average score is : 0.9468349928876245
The neighbor value is : 13
The KNN average score is : 0.9601706970128023
The neighbor value is : 15

The KNN average score is : 0.9601706970128023
The neighbor value is : 17
The KNN average score is : 0.9470128022759602
The neighbor value is : 19
The KNN average score is : 0.9470128022759602
The neighbor value is : 21
The KNN average score is : 0.9470128022759602

Decision criterion has 2 values are **gini** and **entropy**
The entropy show better result.
The gini decision tree average score is : 0.9199857752489332
The entropy decision tree average score is : 0.9263869132290186

Conclusion:
The Linear Discrimination Analysis approach has the best performance with 0.98 compare to 0.96 of KNN and 0.93 of Decision Tree