Classification Report

{('DecisionTreeModel', 1.0), ('SvcModel', 0.99053030303030
3), ('RandomForestModel', 0.9981060606060606), ('KnnModel',
0.9488636363636364), ('NaiveBayesModel', 0.706439393939393
9), ('LogisticRegressionModel', 0.946969696969697)}

1. Gaussian Naive Bayes

```
Gaussian Naive Bayes Acc:  0.7064393939393939
Best Estimators:  DecisionTreeClassifier(max_leaf_nodes=9, random_state
=42)
              precision    recall  f1-score   support

     Class 0       1.00      1.00      1.00        59
     Class 1       1.00      0.50      0.67       151
     Class 2       0.46      0.98      0.63        64
     Class 3       0.82      1.00      0.90        53
     Class 4       0.47      0.97      0.64        65
     Class 5       1.00      0.43      0.61       136

    accuracy                           0.71       528
   macro avg       0.79      0.82      0.74       528
weighted avg       0.85      0.71      0.70       528
```

2. Logistic Regression

```
Logistic Regression Acc:  0.9450757575757576
Best Estimators:  LogisticRegression(C=1438.44988828766, penalty='l1',
random_state=42,
                 solver='liblinear')
              precision    recall  f1-score   support

     Class 0       1.00      1.00      1.00        59
     Class 1       0.95      0.93      0.94       151
     Class 2       0.84      0.92      0.88        64
     Class 3       0.85      0.94      0.89        53
     Class 4       0.98      0.86      0.92        65
     Class 5       0.99      0.99      0.99       136

    accuracy                           0.95       528
   macro avg       0.94      0.94      0.94       528
weighted avg       0.95      0.95      0.95       528
```

3. K-Nearest Neighbors

```
KNN acc:  0.9488636363636364
Best Estimators:  KNeighborsClassifier(metric='manhattan', n_neighbors=
19, weights='distance')
              precision    recall  f1-score   support

    Class 0       1.00      1.00      1.00        59
    Class 1       0.94      1.00      0.97       151
    Class 2       0.96      0.78      0.86        64
    Class 3       0.90      0.98      0.94        53
    Class 4       0.87      0.89      0.88        65
    Class 5       1.00      0.96      0.98       136

    accuracy                          0.95       528
   macro avg      0.94      0.94      0.94       528
weighted avg      0.95      0.95      0.95       528
```

4. Support Vector Classifier

```
SVC Acc:  0.990530303030303
Best Estimators:  SVC(C=4, kernel='linear', random_state=0)
              precision    recall  f1-score   support

    Class 0       1.00      1.00      1.00        59
    Class 1       1.00      1.00      1.00       151
    Class 2       0.97      0.98      0.98        64
    Class 3       1.00      1.00      1.00        53
    Class 4       0.97      0.97      0.97        65
    Class 5       0.99      0.99      0.99       136

    accuracy                          0.99       528
   macro avg      0.99      0.99      0.99       528
weighted avg      0.99      0.99      0.99       528
```

5. Decision Tree

```
Decision Tree acc:  1.0
Best Estimators:  DecisionTreeClassifier(max_leaf_nodes=9, random_state
=42)
             precision    recall  f1-score   support

    Class 0       1.00      1.00      1.00        59
    Class 1       1.00      1.00      1.00       151
    Class 2       1.00      1.00      1.00        64
    Class 3       1.00      1.00      1.00        53
    Class 4       1.00      1.00      1.00        65
    Class 5       1.00      1.00      1.00       136

   accuracy                           1.00       528
  macro avg       1.00      1.00      1.00       528
weighted avg      1.00      1.00      1.00       528
```

6. Random Forest

```
Random Forest Acc:  0.9981060606060606
Best Estimators:  RandomForestClassifier(max_depth=6, min_samples_split
=9, n_estimators=30,
                       random_state=42)
             precision    recall  f1-score   support

    Class 0       1.00      1.00      1.00        59
    Class 1       1.00      1.00      1.00       151
    Class 2       0.98      1.00      0.99        64
    Class 3       1.00      1.00      1.00        53
    Class 4       1.00      1.00      1.00        65
    Class 5       1.00      0.99      1.00       136

   accuracy                           1.00       528
  macro avg       1.00      1.00      1.00       528
weighted avg      1.00      1.00      1.00       528
```