Model Optimization and Tuning Phase Template

Date	15 JULY 2024
Team ID	740075
Project Title	Detection Of Autistic Spectrum Disorder: Classification
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

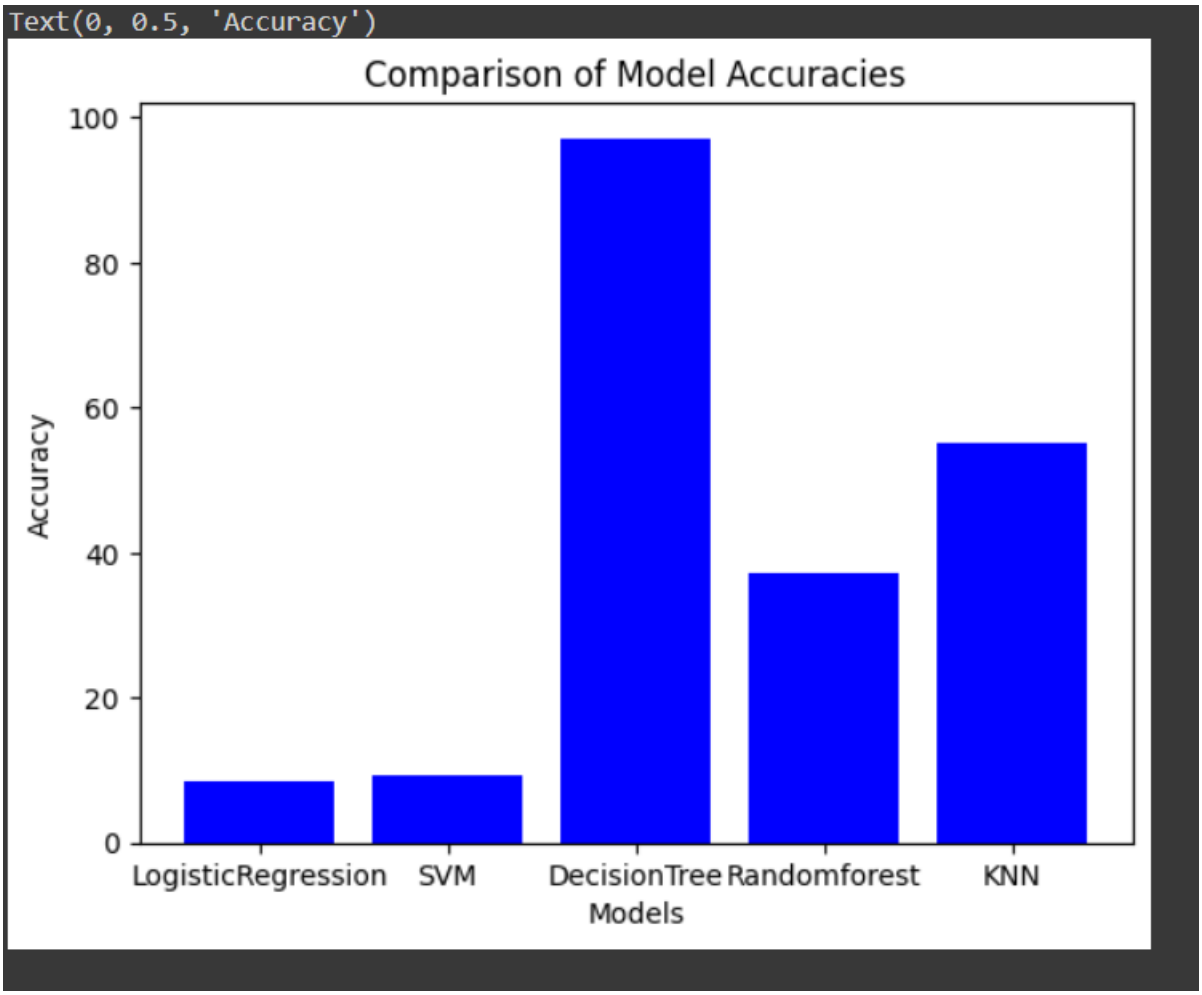
The Model Optimization and Tuning Phase involves refining machine learning models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

Performance Metrics Comparison Report (2 Marks):

```
accuracy_df = pd.DataFrame({
'Model': ['LogisticRegression', 'SVM', 'DecisionTree', 'Randomforest', 'KNN'],
'Accuracy': [accuracy_LR*100, accuracy_SVC*100, accuracy_dt*100, accuracy_RF*100, accuracy_KNN*100]})
print(accuracy_df)
```

```
                Model   Accuracy
0  LogisticRegression   8.490566
1                 SVM   9.433962
2        DecisionTree  97.169811
3        Randomforest  37.264151
4                 KNN  55.188679
```

```
models = ['LogisticRegression', 'SVM', 'DecisionTree', 'Randomforest', 'KNN']
accuracies = [accuracy_LR*100, accuracy_SVC*100, accuracy_dt*100, accuracy_RF*100, accuracy_KNN*100]
plt.bar(models, accuracies, color='blue')
# Add title and axis Labels
plt.title('Comparison of Model Accuracies')
plt.xlabel('Models')
plt.ylabel('Accuracy')
```



Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Decision tree	The model Decision tree usually provides high accuracy due to combining the predictions of multiple decision trees. Its ability to handle complex relationships, minimize overfitting. It can handle both classification and regression justifying its selection as the final model.