Model Optimization and Tuning Phase

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Team ID	739765
Project Title	Occupancy Rates and Demand in the Hospitality Industry.
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.

Hyperparameter Tuning Documentation (6 Marks):

Model	Tuned Hyperparameters	Optimal Values
Logistic Regression	-	-

K-Neighbors Classifier	-	-
Decision Tree Classifier	-	-
SVC	-	

Performance Metrics Comparison Report (2 Marks):

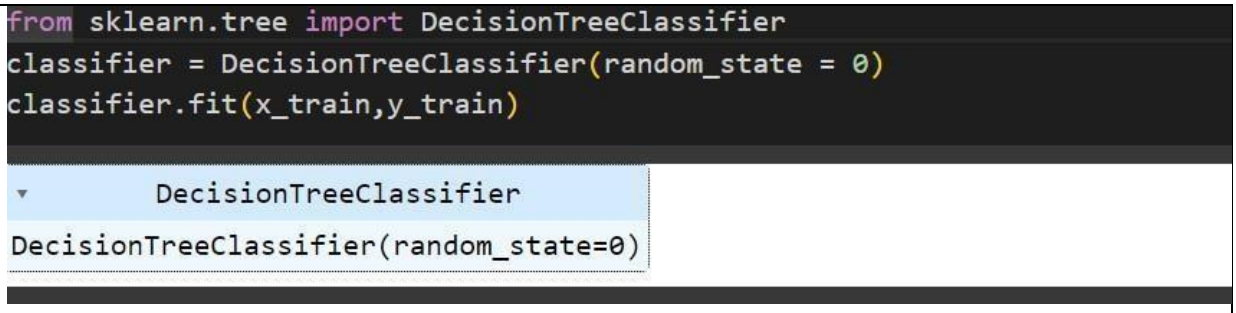
Model	Optimized Metric

Logistic Regression	

```
from sklearn.linear_model import LogisticRegression
lr = LogisticRegression()
lr.fit(x_train, y_train)
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:1143: DataConversionWarning: A column-vector y was passed when a 1d array was expected. Please change the shap
  y = column_or_1d(y, warn=True)
```

```
LogisticRegression()
```

Decision Tree Classifier	

```
from sklearn.tree import DecisionTreeClassifier
classifier = DecisionTreeClassifier(random_state = 0)
classifier.fit(x_train,y_train)
```

```
DecisionTreeClassifier(random_state=0)
```

Final

Model	**Reasoning**

SVC	`from sklearn.svm import SVC`
	`sv=SVC()`
	`sv.fit(x_train,y_train)`
	
	`/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.p`
	`y = column_or_1d(y, warn=True)`
	▾ SVC
	`SVC()`

K-Neighbors Classifier	`from sklearn.neighbors import KNeighborsClassifier`
	`Kn=KNeighborsClassifier()`
	`Kn.fit(x_train, y_train)`
	
	`/usr/local/lib/python3.10/dist-packages/sklearn/neighbors/_classification.py`
	`return self._fit(X, y)`
	▾ KNeighborsClassifier
	`KNeighborsClassifier()`

Final Model Selection Justification (2 Marks):

K-Neighbors Classifier	It is used to find Classification and Regression. KNN classifier is a simple, instance-based learning algorithm. It is a fast and real-time performance.