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Lab 5

In [ ]:
```
import pandas as pd
from sklearn.ensemble import BaggingRegressor, RandomForestRegressor
from sklearn.tree import DecisionTreeRegressor
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error, r2_score
from sklearn import preprocessing

# Load the dataset
data = pd.read_csv('used_car_data.csv')

le = preprocessing.LabelEncoder()
data_train_df = pd.DataFrame(data)
data_train_df_encoded = data_train_df.apply(le.fit_transform)

# Preprocess the data
X = data_train_df_encoded.drop('Present_Price', axis=1)
y = data_train_df_encoded['Present_Price']
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,

# Bagging Regression
bag_reg = BaggingRegressor(base_estimator=DecisionTreeRegressor(), n_esti
bag_reg.fit(X_train, y_train)
bag_pred = bag_reg.predict(X_test)

bag_mse = mean_squared_error(y_test, bag_pred)
bag_r2 = r2_score(y_test, bag_pred)
print('Bagging Regression:')
print('MSE:', bag_mse)
print('R-squared:', bag_r2)

# Random Forest Regression
rf_reg = RandomForestRegressor(n_estimators=100, random_state=42)
rf_reg.fit(X_train, y_train)
rf_pred = rf_reg.predict(X_test)
rf_mse = mean_squared_error(y_test, rf_pred)
rf_r2 = r2_score(y_test, rf_pred)
print('Random Forest Regression:')
print('MSE:', rf_mse)
print('R-squared:', rf_r2)
```

```
Bagging Regression:
MSE: 97.22222622950822
R-squared: 0.9513080302119536
Random Forest Regression:
MSE: 101.10237704918032
R-squared: 0.949364727802497
```

```
/Library/Frameworks/Python.framework/Versions/3.11/lib/python3.11/site-pac
kages/sklearn/ensemble/_base.py:156: FutureWarning: `base_estimator` was r
enamed to `estimator` in version 1.2 and will be removed in 1.4.
  warnings.warn(
```