1) Import Required Libraries

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import r2_score, mean_absolute_error, mean_squared_error
%matplotlib inline
import matplotlib as mpl
mpl.style.use('ggplot')
```

2) Upload and Load Dataset in Google Colab

2.1) Upload CSV File from Your Local System

```
from google.colab import files
uploaded = files.upload()
```

Choose files quikr_car.csv

- **quikr_car.csv**(text/csv) - 60094 bytes, last modified: 04/07/2025 - 100% done

```
Saving quikr_car.csv to quikr_car.csv
```

2.2) Load the CSV File into a DataFrame

```
df = pd.read_csv('quikr_car.csv')
df.head()
```

	name	company	year	Price	kms_driven	fuel_type
0	Hyundai Santro Xing XO eRLX Euro III	Hyundai	2007	80,000	45,000 kms	Petrol
1	Mahindra Jeep CL550 MDI	Mahindra	2006	4,25,000	40 kms	Diesel
2	Maruti Suzuki Alto 800 Vxi	Maruti	2018	Ask For Price	22,000 kms	Petrol
3	Hyundai Grand i10 Magna 1.2 Kappa VTVT	Hyundai	2014	3,25,000	28,000 kms	Petrol
4	Ford EcoSport Titanium 1.5L TDCi	Ford	2014	5,75,000	36,000 kms	Diesel

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3) Explore the Dataset

3.1)Get General Information About the Dataset

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 892 entries, 0 to 891
Data columns (total 6 columns):
 #   Column      Non-Null Count  Dtype 
---  ------      --------------  ----- 
 0   name        892 non-null    object
 1   company     892 non-null    object
 2   year        892 non-null    object
 3   Price       892 non-null    object
 4   kms_driven  840 non-null    object
 5   fuel_type   837 non-null    object
dtypes: object(6)
memory usage: 41.9+ KB
```

3.2) View Summary Statistics

```
df.describe()
```

	name	company	year	Price	kms_driven	fuel_type
count	892	892	892	892	840	837
unique	525	48	61	274	258	3
top	Honda City	Maruti	2015	Ask For Price	45,000 kms	Petrol
freq	13	235	117	35	30	440

3.3) See Column Names

```
df.columns
```

```
Index(['name', 'company', 'year', 'Price', 'kms_driven', 'fuel_type'], dtype='object')
```

3.4) Check for Missing Values

```
df.isnull().sum()
```

	0
name	0
company	0
year	0
Price	0
kms_driven	52
fuel_type	55

dtype: int64

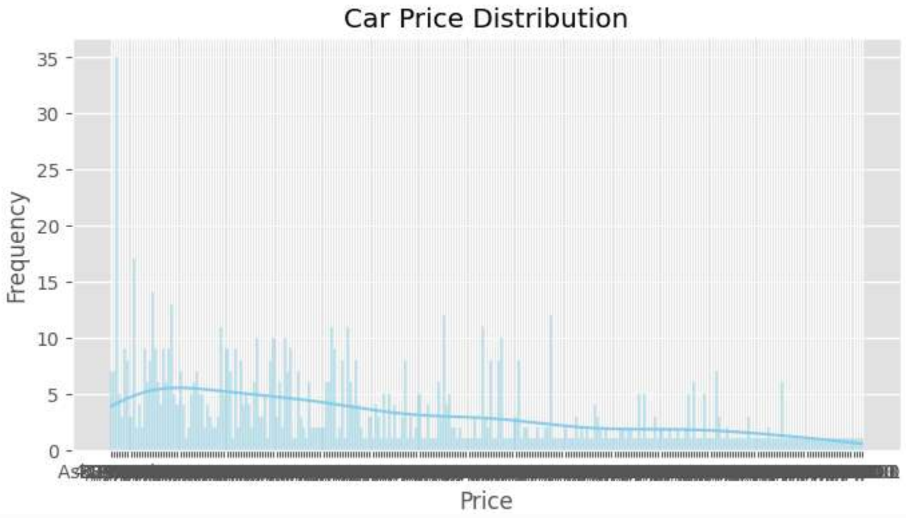
3.5) View Categorical columns

```
df.select_dtypes(include='object').columns
```

```
Index(['name', 'company', 'year', 'Price', 'kms_driven', 'fuel_type'], dtype='object')
```

3.6) Plot Distribution of Target Variable(price)

```
plt.figure(figsize=(8,4))
sns.histplot(df['Price'],kde=True,color='skyblue')
plt.title("Car Price Distribution")
plt.xlabel("Price")
plt.ylabel("Frequency")
plt.show()
```



4) Drop Unnecessary Columns

4.1) Drop Columns That Are Not Useful

```
df.drop(['name', 'company'],axis=1,inplace=True)
```

4.2) Confirm the Columns Are Removed

```
df.columns
```

```
Index(['year', 'Price', 'kms_driven', 'fuel_type'], dtype='object')
```

4.3) Clean Price , kms_driven , and year columns

```
# Filter out rows where 'Price' is 'Ask For Price'
df = df[df['Price'] != 'Ask For Price'].copy()

# Clean 'Price' column
df['Price'] = df['Price'].str.replace('₹', '').str.replace(',', '')
df['Price'] = df['Price'].astype(int)

# Clean 'kms_driven' column and handle non-numeric values
df['kms_driven'] = df['kms_driven'].astype(str).str.replace('kms', '').str.replace(',', '')
df['kms_driven'] = pd.to_numeric(df['kms_driven'], errors='coerce')

# Clean 'year' column and handle non-numeric values
df['year'] = pd.to_numeric(df['year'], errors='coerce')

# Drop rows with NaN values in 'year' or 'kms_driven' after coercion
df.dropna(subset=['year', 'kms_driven'], inplace=True)

# Convert to Int64 after dropping NaNs
df['kms_driven'] = df['kms_driven'].astype('Int64')
df['year'] = df['year'].astype('Int64')

# Correct the typo in kms_driven column name if it exists
if 'km s_driven' in df.columns:
    df.rename(columns={'km s_driven': 'kms_driven'}, inplace=True)
```

5) Encode Categorical Columns

5.1) Check Categorical Columns

```
df.select_dtypes(include='object').columns
```

```
Index(['fuel_type'], dtype='object')
```

5.2) Encode Using LabelEncoder

```
from sklearn.preprocessing import LabelEncoder
le = LabelEncoder()
cat_cols=['fuel_type']
for col in cat_cols:
  df[col] = le.fit_transform(df[col])
```

5.3) Verify the Encoding

```
df.head()
```

	year	Price	kms_driven	fuel_type
0	2007	80000	45000	2
1	2006	425000	40	0
3	2014	325000	28000	2
4	2014	575000	36000	0
6	2012	175000	41000	0

Next steps: Generate code with df View recommended plots New interactive sheet

6)Split the Dataset into Features and target

```
x = df.drop('Price',axis=1)
y=df['Price']
```

6.2) Check the Shapes

```
print("Shape of x:",x.shape)
print("Shape of y:",y.shape)
```

```
Shape of x: (817, 3)
Shape of y: (817,)
```

7) Train-Test Split

7.1) Use train_test_split from scikit-learn

```
from sklearn.model_selection import train_test_split
x_train , x_test , y_train , y_test = train_test_split(x,y,test_size=0.2,random_state=42)
```

7.2) Check Sizes of Splits

```
print("Training set size:",x_train.shape)
print("Testing set size:",y_train.shape)
```

```
Training set size: (653, 3)
Testing set size: (653,)
```

8) Train the Model (Random Forest Regressor)

```
from sklearn.ensemble import RandomForestRegressor
model = RandomForestRegressor(random_state=42)
model.fit(x_train, y_train)
print("Model training complete!")
```

```
Model training complete!
```

9) Make Predictions

```
# Make predictions on the test set
y_pred = model.predict(x_test)

# Show first few predicted values
print("🔮 Predicted Prices (sample):", y_pred[:5])
```

```
🔮 Predicted Prices (sample): [101962.48666667 140560.08       307745.56746032 623676.65666667
 182169.48      ]
```

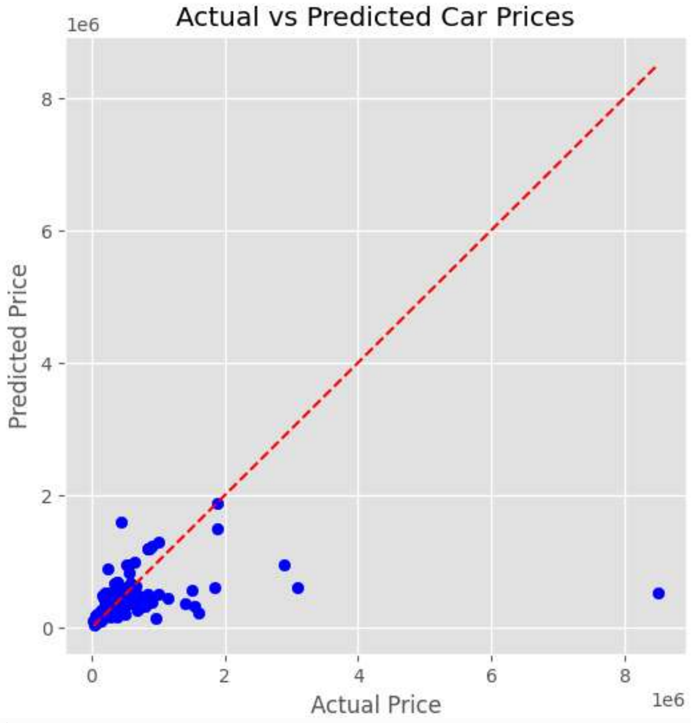
10)Evaluate the Model

```
print("📊 R2 Score :", round(r2_score(y_test, y_pred), 3))
print("📉 MAE      :", round(mean_absolute_error(y_test, y_pred), 2))
print("📉 RMSE     :", round(np.sqrt(mean_squared_error(y_test, y_pred)), 2))
```

```
📊 R2 Score : 0.091
📉 MAE      : 253960.66
📉 RMSE     : 733558.31
```

11) Visualize Actual vs Predicted

```
plt.figure(figsize=(6, 6))
plt.scatter(y_test, y_pred, color='blue')
plt.plot([y_test.min(), y_test.max()], [y_test.min(), y_test.max()], 'r--')
plt.xlabel("Actual Price")
plt.ylabel("Predicted Price")
plt.title("Actual vs Predicted Car Prices")
plt.grid(True)
plt.show()
```



12)Save the Model (Pickle)

```
import pickle

with open('car_price_model.pkl', 'wb') as f:
    pickle.dump(model, f)

print("✅ Model saved as car_price_model.pkl")
```

```
✅ Model saved as car_price_model.pkl
```

13)Predict on New Custom Input

```
new_car = pd.DataFrame([{
    'year': 2018,
    'kms_driven': 30000,
    'fuel_type': 2  # Replace with actual encoded value (like Petrol = 2)
}])

predicted_price = model.predict(new_car)
print("🚗 Predicted Price for New Car: ₹", round(predicted_price[0]))
```

```
🚗 Predicted Price for New Car: ₹ 357793
```