```python
import pandas as pd
from sklearn.preprocessing import LabelEncoder
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier, plot_tree
from sklearn.metrics import classification_report, accuracy_score
import matplotlib.pyplot as plt
from sklearn import tree
from sklearn.ensemble import RandomForestRegressor

df=pd.read_csv("/content/drive/MyDrive/food/Dataset.csv")
df.head()
```

```
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\"0xc48b\"\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
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\"samples\": [\n          \"LUDHRES02DEL03\",\n
\"VADRES02DEL01\",\n          \"INDORES13DEL01\"\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"Delivery_person_Age\",\n
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26.0,\n          25.0\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
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4.8\n        ],\n        \"semantic_type\": \"\",\n
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\"num_unique_values\": 657,\n        \"samples\": [\n          -
17.426228,\n          12.981615,\n          17.431668\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"Restaurant_longitude\",\n
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```

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\"17:40\"\n        ],\n        \"semantic_type\": \"\",\n
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\"10:40\"\n        ],\n        \"semantic_type\": \"\",\n
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}\n    },\n    {\n      \"column\": \"Road_traffic_density\",\n
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\"High\",\n          \"Low\",\n          \"Jam\"\n        ],\n
\"semantic_type\": \"\",\n        \"description\": \"\"\n      }\
n    },\n    {\n      \"column\": \"Vehicle_condition\",\n
\"properties\": {\n        \"dtype\": \"number\",\n        \"std\":
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\"num_unique_values\": 4,\n        \"samples\": [\n          1,\n
3,\n          2\n        ],\n        \"semantic_type\": \"\",\n
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],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"Type_of_vehicle\",\n
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],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
```

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}\n    },\n    {\n      \"column\": \"multiple_deliveries\",\n
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\"description\": \"\"\n      }\n    },\n    {\n      \"column\":
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],\n        \"semantic_type\": \"\",\n        \"description\": \"\"\n
}\n    },\n    {\n      \"column\": \"Time_taken (min)\",\n
\"properties\": {\n        \"dtype\": \"number\",\n        \"std\":
9,\n        \"min\": 10,\n        \"max\": 54,\n
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16\n        ],\n        \"semantic_type\": \"\",\n
\"description\": \"\"\n      }\n    }\n  ]\
n}","type":"dataframe","variable_name":"df"}
```

```
df = pd.DataFrame(df)

le = LabelEncoder()
df['Road_traffic_density'] =
le.fit_transform(df['Road_traffic_density'])
df['Weather_conditions'] = le.fit_transform(df['Weather_conditions'])

le = LabelEncoder()
df['Type_of_order'] = le.fit_transform(df['Type_of_order'])
X = df[['Weather_conditions', 'Road_traffic_density',
'Vehicle_condition', 'Type_of_order']]
y = df['Time_taken (min)']

model = RandomForestRegressor(n_estimators=5, random_state=42)
model.fit(X, y)
```

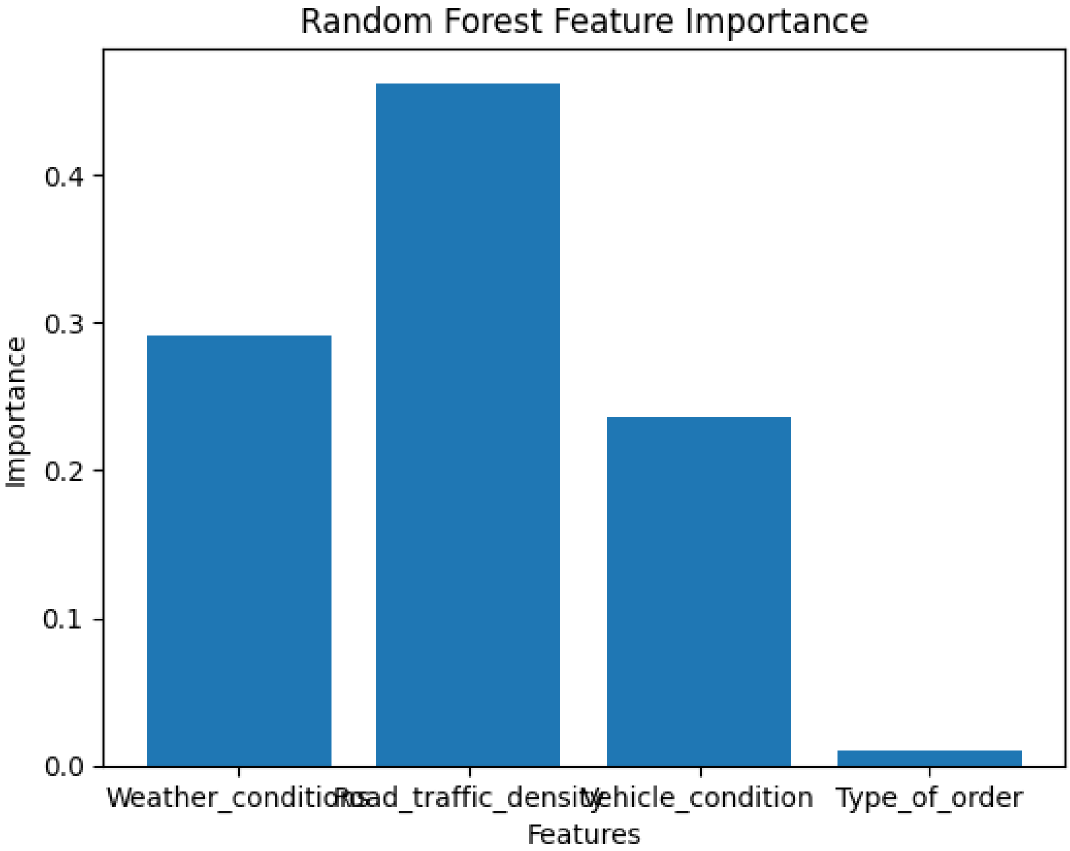
```
RandomForestRegressor(n_estimators=5, random_state=42)
```

```
pred = model.predict([[4.5, 5, 1, 2]])
print("Predicted Delivery Time:", pred)
```

```
Predicted Delivery Time: [17.72910507]
```

```
/usr/local/lib/python3.12/dist-packages/sklearn/utils/
validation.py:2739: UserWarning: X does not have valid feature names,
but RandomForestRegressor was fitted with feature names
  warnings.warn(
importance = model.feature_importances_

plt.figure()
plt.bar(X.columns, importance)
plt.xlabel("Features")
plt.ylabel("Importance")
plt.title("Random Forest Feature Importance")
plt.show()
```



```
tree = model.estimators_[0]

plt.figure(figsize=(20,10))
plot_tree(
    tree,
    feature_names=X.columns,
    filled=True,
    rounded=True
)
plt.title("Random Forest – One Decision Tree Visualization")
plt.show()
```

Random Forest – One Decision Tree Visualization