Machine Learning

Multiple Linear Regression

Step-1 Import Libraries

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

Step-2 Import dataset

```
import pandas as pd
df = pd.read_csv("mldata1.csv")
df.head()
```

	age	height	weight	gender	likeness
0	27	170.688	76.0	Male	Biryani
1	41	165	70.0	Male	Biryani
2	29	171	80.0	Male	Biryani
3	27	173	102.0	Male	Biryani
4	29	164	67.0	Male	Biryani

Step-3 Making input and Output Variable

```
df["gender"] = df["gender"].replace("Male",1)
df["gender"] = df["gender"].replace("Female",0)
```

```
X = df[["weight","gender"]]
y = df["likeness"]
```

Step-4 Making Machine Learning Model

```
from sklearn.tree import DecisionTreeClassifier
model = DecisionTreeClassifier().fit(X,y)
model.predict([[43,0]])
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/base.py:439: UserWarning: X does not have valid feature names, but DecisionTreeClassifie
  warnings.warn(
array(['Samosa'], dtype=object)
```

Step-5 Checking machine learning model performance

```
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
X_train, X_test, y_train, y_test = train_test_split(X,y,test_size=0.2)
model = DecisionTreeClassifier().fit(X_train,y_train)
predicted_values = model.predict(X_test)
predicted_values
```

```
array(['Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani',
       'Biryani', 'Biryani', 'Biryani', 'Pakora', 'Biryani', 'Biryani',
       'Pakora', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani',
       'Pakora', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani',
       'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani',
       'Samosa', 'Biryani', 'Biryani', 'Pakora', 'Biryani', 'Biryani',
       'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Samosa',
       'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Samosa', 'Biryani',
       'Biryani'], dtype=object)
```

checking the score

```
score = accuracy_score(y_test, predicted_values)
score
```

```
0.6530612244897959
```

Step-6 Making Visualization

```
from sklearn import tree
model = DecisionTreeClassifier().fit(X,y)
tree.export_graphviz(model,out_file= "foodie.dot",
                     feature_names=["age","gender"],
                       class_names=sorted(y.unique()),
                       label="all",rounded=True,filled=True)
```