# 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
```

## 2 Import Data Set

```
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 |

## 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([[49,0]])
```

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

```
       'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani',
       'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani',
       'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Pakora',
       'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani',
       'Biryani', 'Biryani', 'Biryani', 'Biryani', 'Samosa', 'Biryani',
       'Pakora'], dtype=object)
```

## 6checking the score

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

```
0.673469387755102
```

## Step-7 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)

```

```
1
```