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K-Nearest - Neighbours

Practice and task given in the video.

In [1]:
```
import pandas as pd
df = pd.read_csv("mldata.csv")
df.head()
```

Out[1]:

	age	weight	gender	likeness	height
0	27	76.0	Male	Biryani	170.688
1	41	70.0	Male	Biryani	165.000
2	29	80.0	Male	Biryani	171.000
3	27	102.0	Male	Biryani	173.000
4	29	67.0	Male	Biryani	164.000

In [2]:
```
# here i can covert the gender column string to integer
df["gender"] = df["gender"].replace(["Male","Female"],[1,0])
# df["gender"] = df["gender"].replace("Female",0)
```

In [3]:
```
df.tail(10)
```

Out[3]:

	age	weight	gender	likeness	height
235	20	48.0	1	Biryani	155.0
236	30	50.0	0	Biryani	5.3
237	24	60.0	1	Biryani	114.0
238	22	50.0	1	Samosa	6.0
239	27	63.0	1	Biryani	165.0
240	31	60.0	1	Pakora	160.0
241	26	70.0	1	Biryani	172.0
242	40	80.0	1	Biryani	178.0
243	25	65.0	1	Biryani	5.7
244	33	56.0	0	Samosa	157.0

In [4]:
```
x = df[["weight","gender"]]
y =df["likeness"]
```

In [5]:
```
x.head()
```

Out[5]:

	weight	gender
0	76.0	1
1	70.0	1
2	80.0	1
3	102.0	1
4	67.0	1

In [6]:
```
y.head()
```

Out[6]:
```
0    Biryani
1    Biryani
2    Biryani
3    Biryani
4    Biryani
Name: likeness, dtype: object
```

In [7]:
```
from sklearn.neighbors import KNeighborsClassifier

# Create and Fit our model

model = KNeighborsClassifier().fit(x,y)
model
```

Out[7]:
```
KNeighborsClassifier()
```

In [8]:
```
model.predict([[70,1]])
```

Out[8]:
```
array(['Biryani'], dtype=object)
```

In [9]:
```
from sklearn.neighbors import KNeighborsClassifier

# Create and Fit our model

model = KNeighborsClassifier(n_neighbors=5).fit(x,y)
predicted = model.predict([[70,1]])
predicted
```

Out[9]:
```
array(['Biryani'], dtype=object)
```

In [10]:
```
model.predict(x)
```

Out[10]:
```
array(['Biryani', 'Biryani', 'Biryani', 'Biryani', 'Biryani', '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', 'Samosa', 'Samosa', 'Pakora', 'Biryani',
```

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

These commad to check where can we used?

- Precision_Score
- recall_score
- f1_score

In [24]:

```
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
from sklearn.metrics import precision_score
from sklearn.metrics import recall_score
from sklearn.metrics import f1_score
"""here i can see multiple command to check the accuracy Score

   1- Precision_Score
   2- recall_score
   3- f1_score
"""

X_train,X_test,y_train,y_test = train_test_split(x , y , test_size = 0.2,random_state =
```

```
## Create a model and fitting a model
model = KNeighborsClassifier()
model.fit(X_train,y_train)
predicted_values = model.predict(X_test)
print(predicted_values)


#Checking Score

score = accuracy_score(y_test,predicted_values)
print()
print("The accuracy score our model = ",score)
```

```
['Biryani' 'Biryani' 'Pakora' 'Biryani' 'Samosa' 'Biryani' 'Biryani'
 'Biryani' 'Biryani' 'Biryani' 'Samosa' 'Biryani' 'Samosa' 'Pakora'
 'Biryani' 'Biryani' 'Biryani' 'Biryani' 'Biryani' 'Pakora' 'Biryani'
 'Biryani' 'Biryani' 'Biryani' 'Biryani' 'Biryani' 'Biryani' 'Samosa'
 'Biryani' 'Samosa' 'Biryani' 'Biryani' 'Biryani' 'Biryani' 'Biryani'
 'Biryani' 'Biryani' 'Biryani' 'Samosa' 'Biryani' 'Biryani' 'Biryani'
 'Biryani' 'Biryani' 'Biryani' 'Biryani' 'Biryani' 'Biryani' 'Biryani']

The accuracy score our model =  0.6122448979591837
```

recall_score

In [15]:

```
score = recall_score(y_test,predicted_values, average = "micro")
print()
print("The precisio score of our model = ",score)
```

```
The precisio score of our model =  0.6122448979591837
```

In [16]:

```
score = recall_score(y_test,predicted_values, average = "macro")
print()
print("The precisio score of our model = ",score)
```

```
The precisio score of our model =  0.4016203703703704
```

In [17]:

```
score = recall_score(y_test,predicted_values, average = "weighted")
print()
print("The precisio score of our model = ",score)
```

```
The precisio score of our model =  0.6122448979591837
```

Precision Score

In [21]:

```
score = precision_score(y_test,predicted_values, average = "weighted")
print()
print("The precisio score of our model = ",score)
```

```
The precisio score of our model =  0.5564625850340137
```

In [22]:

```
score = precision_score(y_test,predicted_values, average = "macro")
print()
print("The precisio score of our model = ",score)
```

```
The precisio score of our model =  0.4472222222222222
```

In [23]:
```
score = precision_score(y_test,predicted_values, average = "micro")
print()
print("The precisio score of our model = ",score)
```

```
The precisio score of our model =  0.6122448979591837
```

f1_score

In [25]:
```
score = f1_score(y_test,predicted_values, average = "micro")
print()
print("The f1 score of our model = ",score)
```

```
The f1 score of our model =  0.6122448979591837
```

In [26]:
```
score = f1_score(y_test,predicted_values, average = "macro")
print()
print("The f1 score of our model = ",score)
```

```
The f1 score of our model =  0.40079365079365076
```

In [27]:
```
score = f1_score(y_test,predicted_values, average = "weighted")
print()
print("The f1 score of our model = ",score)
```

```
The f1 score of our model =  0.5670553935860058
```