Department of Computer Science and Engineering

29th Batch

Lab Report 8

Course title : Artificial Intelligence Lab
Course Code : CSE - 414

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➢ Question: KNN-Based Data Classification Using 150 Data Points.

❖ Solution(Code & Output):

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

df = pd.read_csv("Sports.csv")
df.head()
```

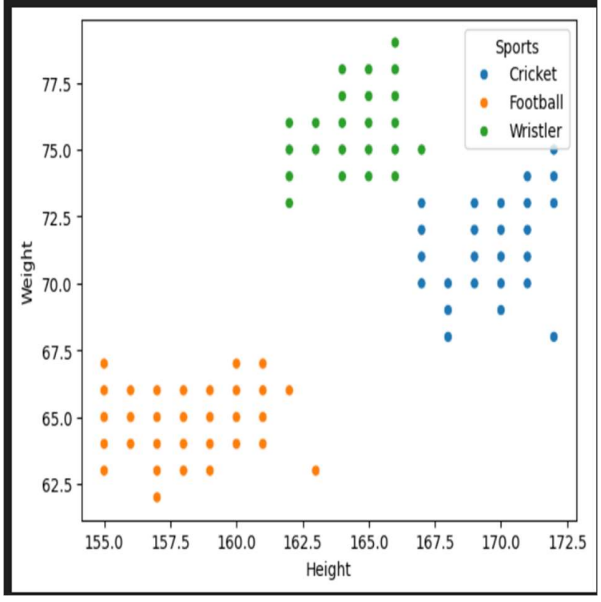
	Height	Weight	Sports
0	168	68	Cricket
1	170	69	Cricket
2	155	65	Football
3	160	65	Football
4	172	68	Cricket
5	161	64	Football
6	165	75	Wristler
7	166	76	Wristler
8	165	78	Wristler
9	155	67	Football

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 148 entries, 0 to 147
Data columns (total 3 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   Height  148 non-null    int64
 1   Weight  148 non-null    int64
 2   Sports  148 non-null    object
dtypes: int64(2), object(1)
memory usage: 3.6+ KB
```

```
sns.scatterplot(data=df, x="Height",
y="Weight", hue="Sports")
```

```
<Axes: xlabel='Height', ylabel='Weight'>
```

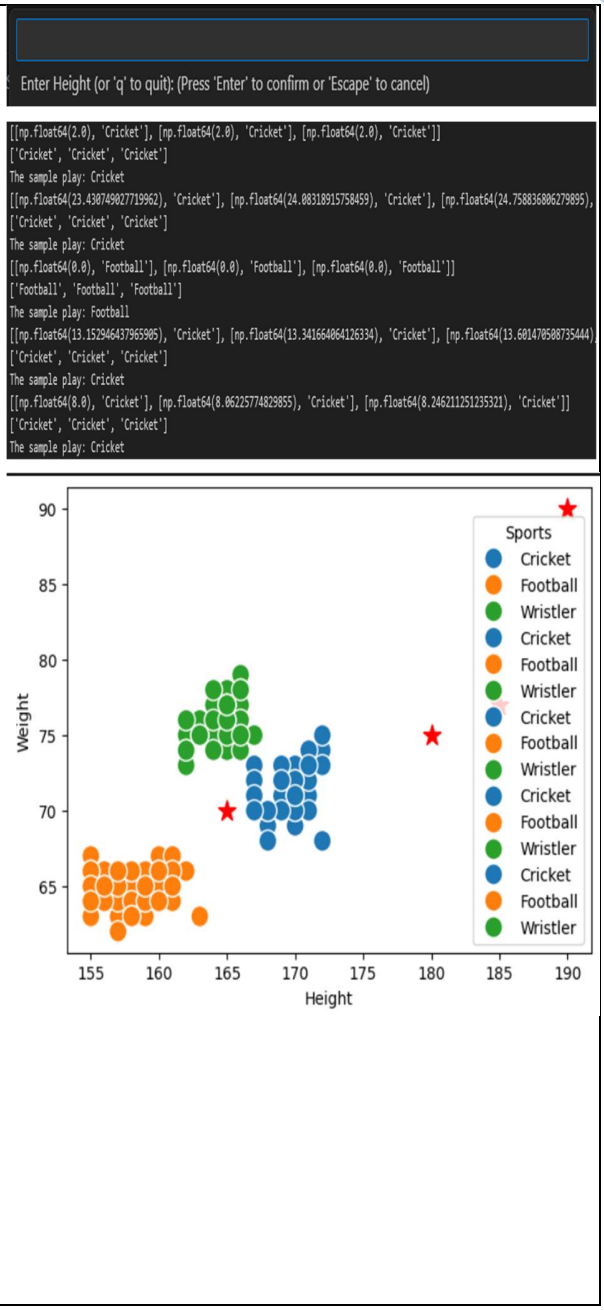


```
def KNN(data, new_sample, k):
    dis = [ ]
    for sample in data.iterrows():
        ecd =
np.linalg.norm(np.array([sample[1].Height,
sample[1].Weight]) - np.array(new_sample))
        dis.append([ecd, sample[1].Sports])
    dis = sorted(dis)[:k]
    votes = [sample[1] for sample in dis]
    print(dis)
    print(votes)

    result =
Counter(votes).most_common()[0][0]
    print("The sample play: " + result)

    sns.scatterplot(data=df, x="Height",
y="Weight", hue="Sports", s=150)
    plt.scatter(x=new_sample[0],
y=new_sample[1], marker="*", color="red",
s=150)


while True:
    h = input("Enter Height (or 'q' to quit): ")
    if h == 'q':
        break
    w = input("Enter Weight: ")
    KNN(data=df, new_sample=[int(h),
int(w)], k=3)
```



❖ Conclusion:

In this lab, I created a dataset of 150 samples and applied the KNN algorithm to classify sports from height and weight data. I implemented a loop that takes user input repeatedly and provides predictions with real-time plots. This helped me understand both algorithm logic and user interaction in a data-driven system.