

Assignment no.- 03

Aim-

1. Summary statistics
2. Types of Variables
3. Summary statistics of income grouped by the age groups
4. Display basic statistical details on the iris dataset.

```
In [1]: import pandas as pd
import numpy as np
```

```
In [30]: df=pd.read_csv("C:\\Users\\SS0S03\\Desktop\\data.csv")
```

```
In [31]: df
```

```
Out[31]:
```

	Unnamed: 0	customer id	age	income	spending score
0	0	1	19.0	42.0	NaN
1	1	2	20.0	NaN	55.0
2	2	3	28.0	NaN	NaN
3	3	4	29.0	NaN	NaN
4	4	5	23.0	NaN	NaN
5	5	6	23.0	NaN	NaN
6	6	7	NaN	NaN	NaN
7	7	8	32.0	NaN	NaN
8	8	9	43.0	NaN	NaN
9	9	10	36.0	NaN	NaN
10	10	11	NaN	NaN	NaN
11	11	12	20.0	NaN	NaN

```
In [32]: df.mean()
```

```
Out[32]: Unnamed: 0      26.000
customer id      27.000
age              32.425
income           42.000
spending score   55.000
dtype: float64
```

```
In [39]: df.loc[:, 'age '].mean()
```

```
Out[39]: 32.425
```

```
In [40]: df.mean(axis=1)[0:4]
```

```
Out[40]: 0    15.5
1    19.5
2    11.0
3    12.0
dtype: float64
```

```
In [41]: df.median()
```

```
Out[41]: Unnamed: 0      26.0  
customer id    27.0  
age            32.5  
income         42.0  
spending score 55.0  
dtype: float64
```

```
In [43]: df.loc[:, 'age '].median()
```

```
Out[43]: 32.5
```

```
In [44]: df.mode()
```

```
Out[44]:
```

	Unnamed: 0	customer id	age	income	spending score
0	0	1	29.0	42.0	55.0
1	1	2	NaN	NaN	NaN
2	2	3	NaN	NaN	NaN
3	3	4	NaN	NaN	NaN
4	4	5	NaN	NaN	NaN
5	5	6	NaN	NaN	NaN
6	6	7	NaN	NaN	NaN
7	7	8	NaN	NaN	NaN
8	8	9	NaN	NaN	NaN
9	9	10	NaN	NaN	NaN
10	10	11	NaN	NaN	NaN
11	11	12	NaN	NaN	NaN

```
In [46]: df.loc[:, 'age '].mode()
```

```
Out[46]: 0    29.0  
Name: age , dtype: float64
```

```
In [47]: df.min()
```

```
Out[47]: Unnamed: 0      0.0  
customer id      1.0  
age             19.0  
income          42.0  
spending score  55.0  
dtype: float64
```

```
In [49]: df.loc[:, 'age '].min(skipna = False)
```

```
Out[49]: nan
```

```
In [50]: df.max()
```

```
Out[50]: Unnamed: 0      52.0  
customer id    53.0  
age            50.0  
income         42.0  
spending score 55.0  
dtype: float64
```

```
In [52]: df.loc[:, 'age '].max(skipna = False)
```

```
Out[52]: nan
```

```
In [53]: df.std()
```

```
Out[53]: Unnamed: 0      15.443445  
customer id    15.443445  
age            9.747814  
income         NaN  
spending score NaN  
dtype: float64
```

```
In [54]: df.loc[:, 'age '].std()
```

```
Out[54]: 9.747813693073532
```

```
In [55]: df.std(axis=1)[0:4]
```

```
Out[55]: 0    19.706175  
1    25.225648  
2    14.730920  
3    14.730920  
dtype: float64
```

```
In [57]: df.groupby(['customer id'])['age '].mean()
```

```
Out[57]: customer id  
1      19.0  
2      20.0  
3      28.0  
4      29.0  
5      23.0  
6      23.0  
7      NaN  
8      32.0  
9      43.0  
10     36.0  
11     NaN  
12     20.0  
13     19.0  
14     23.0  
15     49.0  
16     43.0  
17     NaN  
18     47.0  
19     19.0
```

```
In [71]: df_u=df.rename(columns= {'income':' new income'},inplace=False)
df_u.groupby(['age ']).income.mean()
```

```
Out[71]: age
19.0    42.0
20.0     NaN
21.0     NaN
22.0     NaN
23.0     NaN
28.0     NaN
29.0     NaN
31.0     NaN
32.0     NaN
33.0     NaN
34.0     NaN
36.0     NaN
37.0     NaN
38.0     NaN
40.0     NaN
43.0     NaN
45.0     NaN
47.0     NaN
49.0     NaN
```

```
In [73]: from sklearn import preprocessing
enc = preprocessing.OneHotEncoder()
enc_df = pd.DataFrame(enc.fit_transform(df[['age ']]).toarray())
enc_df
```

```
Out[73]:
```

	0	1	2	3	4	5	6	7	8	9	...	11	12	13	14	15	16	17	18
0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

```
In [74]: df_encode = df_u.join(enc_df)
df_encode
```

```
Out[74]:
```

	Unnamed: 0	customer id	age	income	spending score	0	1	2	3	4	...	11	12	13
0	0	1	19.0	42.0	NaN	1.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0
1	1	2	20.0	NaN	55.0	0.0	1.0	0.0	0.0	0.0	...	0.0	0.0	0.0
2	2	3	28.0	NaN	NaN	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0
3	3	4	29.0	NaN	NaN	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0
4	4	5	23.0	NaN	NaN	0.0	0.0	0.0	0.0	1.0	...	0.0	0.0	0.0
5	5	6	23.0	NaN	NaN	0.0	0.0	0.0	0.0	1.0	...	0.0	0.0	0.0
6	6	7	NaN	NaN	NaN	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0
7	7	8	32.0	NaN	NaN	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0
8	8	9	43.0	NaN	NaN	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0
9	9	10	36.0	NaN	NaN	0.0	0.0	0.0	0.0	0.0	...	1.0	0.0	0.0
10	10	11	NaN	NaN	NaN	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0

```
In [91]: col_names = ['Sepal_Length', 'Sepal_Width', 'Petal_Length', 'Petal_Width', 'Species']
```

```
In [93]: iris = pd.read_csv('https://archive.ics.uci.edu/ml/machine-learning-databases/iris/iris.data')
```

```
In [94]: irisSet = (iris['Species'] == 'Iris-setosa')
```

```
In [95]: print('Iris-setosa')
print(iris[irisSet].describe())
```

```
Iris-setosa
      Sepal_Length  Sepal_Width  Petal_Length  Petal_Width
count      50.00000      50.00000      50.00000      50.00000
mean         5.00600         3.41800         1.46400         0.24400
std          0.35249         0.38102         0.17351         0.10721
min          4.30000         2.30000         1.00000         0.10000
25%          4.80000         3.12500         1.40000         0.20000
50%          5.00000         3.40000         1.50000         0.20000
75%          5.20000         3.67500         1.57500         0.30000
max          5.80000         4.40000         1.90000         0.60000
```

```
In [96]: irisVer = (iris['Species'] == 'Iris-versicolor')
```

```
In [97]: print('Iris-versicolor')  
print(iris[irisVer].describe())
```

```
Iris-versicolor  
      Sepal_Length  Sepal_Width  Petal_Length  Petal_Width  
count      50.000000      50.000000      50.000000      50.000000  
mean         5.936000         2.770000         4.260000         1.326000  
std          0.516171         0.313798         0.469911         0.197753  
min          4.900000         2.000000         3.000000         1.000000  
25%          5.600000         2.525000         4.000000         1.200000  
50%          5.900000         2.800000         4.350000         1.300000  
75%          6.300000         3.000000         4.600000         1.500000  
max          7.000000         3.400000         5.100000         1.800000
```

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