ASSIGNMENT – IV

Assignment Date	17.10.2022
Team ID	PNT2022TMID19527
Project Name	Analytics for hospital health Care data

```
pip install numpy
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/
Requirement already satisfied: numpy in /usr/local/lib/python3.7/dist-packages (1.21
```

```
import  numpy
import numpy as np
from numpy import *
```

```
pip install matplotlib
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/
Requirement already satisfied: matplotlib in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: python-dateutil>=2.1 in /usr/local/lib/python3.7/dist
Requirement already satisfied: numpy>=1.11 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.1 in /usr/loca
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.7/dist-package
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.7/dist-pa
Requirement already satisfied: typing-extensions in /usr/local/lib/python3.7/dist-pa
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages (f
```

```
pip install seaborn
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/
Requirement already satisfied: seaborn in /usr/local/lib/python3.7/dist-packages (0.
Requirement already satisfied: pandas>=0.23 in /usr/local/lib/python3.7/dist-package
Requirement already satisfied: numpy>=1.15 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: matplotlib>=2.2 in /usr/local/lib/python3.7/dist-pack
Requirement already satisfied: scipy>=1.0 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.1 in /usr/loca
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.7/dist-pa
Requirement already satisfied: python-dateutil>=2.1 in /usr/local/lib/python3.7/dist
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.7/dist-package
Requirement already satisfied: typing-extensions in /usr/local/lib/python3.7/dist-pa
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.7/dist-package
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages (f
```

```
import seaborn as sns
```

```
pip install pandas
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/
Requirement already satisfied: pandas in /usr/local/lib/python3.7/dist-packages (1.3
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.7/dist-package
Requirement already satisfied: numpy>=1.17.3 in /usr/local/lib/python3.7/dist-packag
Requirement already satisfied: python-dateutil>=2.7.3 in /usr/local/lib/python3.7/di
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages (f
```

```
import pandas as pd
```

EXPLORING THE DATA

```
df = pd.read_csv("/content/drive/My Drive/Machine Learning/abalone.csv")
```

```
df
```

	Sex	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight	Shell weight	Rings
0	M	0.455	0.365	0.095	0.5140	0.2245	0.1010	0.1500	15
1	M	0.350	0.265	0.090	0.2255	0.0995	0.0485	0.0700	7
2	F	0.530	0.420	0.135	0.6770	0.2565	0.1415	0.2100	9
3	M	0.440	0.365	0.125	0.5160	0.2155	0.1140	0.1550	10
4	I	0.330	0.255	0.080	0.2050	0.0895	0.0395	0.0550	7
...	...	...	...	...	...	...	...	...	...
4172	F	0.565	0.450	0.165	0.8870	0.3700	0.2390	0.2490	11
4173	M	0.590	0.440	0.135	0.9660	0.4390	0.2145	0.2605	10
4174	M	0.600	0.475	0.205	1.1760	0.5255	0.2875	0.3080	9
4175	F	0.625	0.485	0.150	1.0945	0.5310	0.2610	0.2960	10
4176	M	0.710	0.555	0.195	1.9485	0.9455	0.3765	0.4950	12

4177 rows × 9 columns

```
df.head()
```

	Sex	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight	Shell weight	Rings
0	M	0.455	0.365	0.095	0.5140	0.2245	0.1010	0.150	15
1	M	0.350	0.265	0.090	0.2255	0.0995	0.0485	0.070	7
2	F	0.530	0.420	0.135	0.6770	0.2565	0.1415	0.210	9
3	M	0.440	0.365	0.125	0.5160	0.2155	0.1140	0.155	10
4	I	0.330	0.255	0.080	0.2050	0.0895	0.0395	0.055	7

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4177 entries, 0 to 4176
Data columns (total 9 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Sex             4177 non-null   object
 1   Length          4177 non-null   float64
```

```
 2   Diameter        4177 non-null   float64
 3   Height          4177 non-null   float64
 4   Whole weight    4177 non-null   float64
 5   Shucked weight  4177 non-null   float64
 6   Viscera weight  4177 non-null   float64
 7   Shell weight    4177 non-null   float64
 8   Rings           4177 non-null   int64
dtypes: float64(7), int64(1), object(1)
memory usage: 293.8+ KB
```

DESCRIPTIVE ANALYSIS

```
df.describe()
```

	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight	
count	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000	41
mean	0.523992	0.407881	0.139516	0.828742	0.359367	0.180594	
std	0.120093	0.099240	0.041827	0.490389	0.221963	0.109614	
min	0.075000	0.055000	0.000000	0.002000	0.001000	0.000500	
25%	0.450000	0.350000	0.115000	0.441500	0.186000	0.093500	
50%	0.545000	0.425000	0.140000	0.799500	0.336000	0.171000	
75%	0.615000	0.480000	0.165000	1.153000	0.502000	0.253000	

```
df.describe(include=['object'])
```

	Sex
count	4177
unique	3
top	M
freq	1528

```
df['Rings'].value_counts()
```

```
9     689
10    634
8     568
11    487
7     391
12    267
6     259
13    203
14    126
5     115
```

```
15    103
16     67
17     58
4      57
18     42
19     32
20     26
3      15
21     14
23      9
22      6
27      2
24      2
1       1
26      1
29      1
2       1
25      1
Name: Rings, dtype: int64
```

```
df['Sex'].value_counts()
```

```
M    1528
I    1342
F    1307
Name: Sex, dtype: int64
```

```
df['Sex'].value_counts().to_frame()
```

	Sex
M	1528
I	1342
F	1307

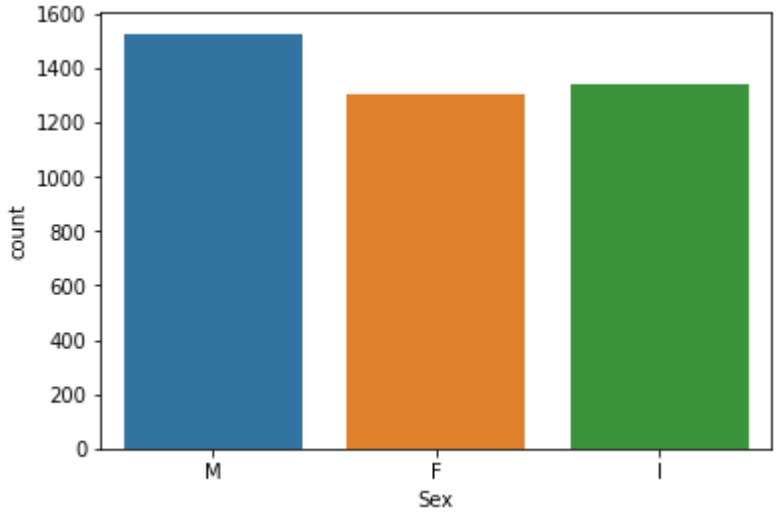
```
df['Whole weight'].value_counts().to_frame()
```

	Whole weight
0.2225	8
1.1345	7
0.0700	7

UNIVARIATE ANALYSIS

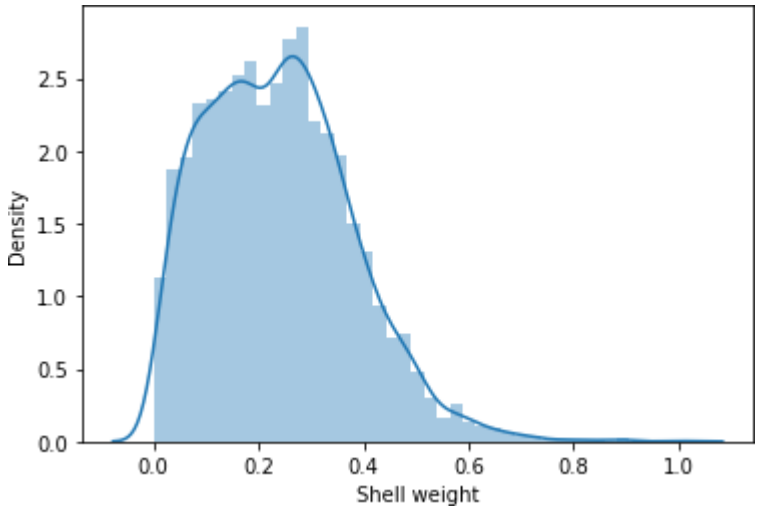
```
sns.countplot(df['Sex'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7ff9f1886d90>
```




```
sns.distplot(df['Shell weight'])
```

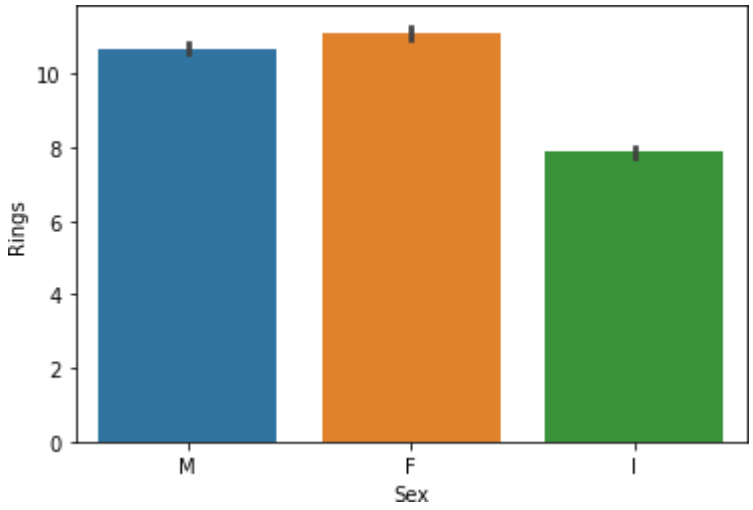
```
/usr/local/lib/python3.7/dist-packages/seaborn/distributions.py:2619: FutureWarning:
  warnings.warn(msg, FutureWarning)
<matplotlib.axes._subplots.AxesSubplot at 0x7ff9f1292110>
```



BIVARIATE ANALYSIS

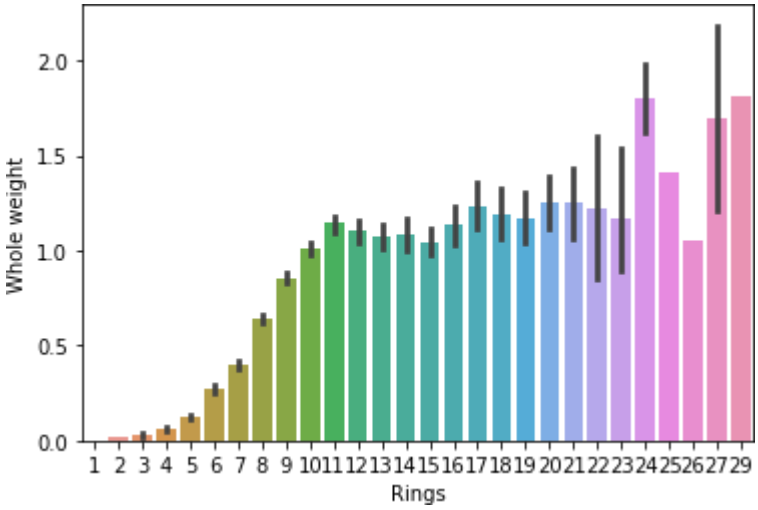
```
sns.barplot(df['Sex'],df['Rings'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7ff9f11b2410>
```




```
sns.barplot(df['Rings'],df['Whole weight'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7ff9f0a2bb10>
```



MULTIVARIATE PLOT

```
sns.scatterplot(df['Sex'],df['Rings'],df['Whole weight'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7ff9ed552150>
```

FINDING THE MISSING VALUE

```
df.isnull()
```

	Sex	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight	Shell weight	Rings
0	False	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	...	...
4172	False	False	False	False	False	False	False	False	False
4173	False	False	False	False	False	False	False	False	False
4174	False	False	False	False	False	False	False	False	False
4175	False	False	False	False	False	False	False	False	False
4176	False	False	False	False	False	False	False	False	False

4177 rows × 9 columns

```
x= df.iloc[:,0:4].values
y= df.iloc[:,4:5].values
```

```
df.head()
```

```
                                        Whole     Shucked     Viscera     Shell
x.shape
```

```
(4177, 4)
```

```
y.shape
```

```
(4177, 1)
```

```
df.isnull().any()
```

```
Sex               False
Length            False
Diameter          False
Height            False
Whole    weight   False
Shucked   weight  False
Viscera   weight  False
Shell weight      False
Rings             False
dtype: bool
```

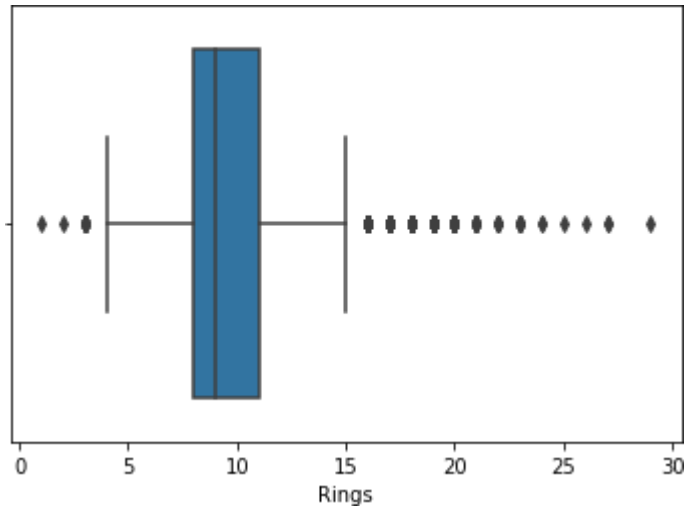
```
df['Whole weight'].unique()
```

```
array([0.514 , 0.2255, 0.677 , ..., 1.176 , 1.0945, 1.9485])
```

IDENTIFY THE OUTLIERS

```
sns.boxplot(df['Rings'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7ff9e2bc4890>
```




```
from sklearn.preprocessing import OneHotEncoder
```

```
one= OneHotEncoder()
z = one.fit_transform(x[:,3:4]).toarray()

z
```

```
array([[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.]])
```

```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test = train_test_split(x,y, test_size=0.2, random_state= 0)
```

```
x_train.shape
```

```
(3341, 4)
```