```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
```

02.Load the Dataset

```
from google.colab import drive
drive.mount('/content/drive')
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call drive.
```

Read the Dataset

```
mydata=pd.read_csv('/content/drive/MyDrive/Colab Notebooks/abalone.csv')
```

```
mydata.shape
```

```
(4177, 9)
```

```
mydata.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

```
mydata.tail()
```

	Sex	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight	Shell weight	Rings
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

```
mydata.columns
```

```
Index(['Sex', 'Length', 'Diameter', 'Height', 'Whole weight', 'Shucked weight',
       'Viscera weight', 'Shell weight', 'Rings'],
      dtype='object')
```

```
mydata.describe()
```

	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight	
count	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000	4
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	

```
mydata.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
```

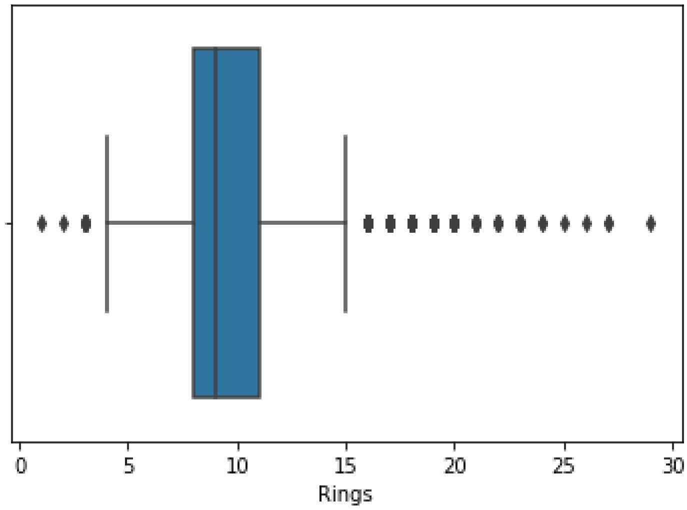
```
mydata.dtypes
```

```
Sex                object
Length            float64
Diameter          float64
Height            float64
Whole weight      float64
Shucked weight    float64
Viscera weight    float64
Shell weight      float64
Rings               int64
dtype: object
```

03.Perform Virtualization

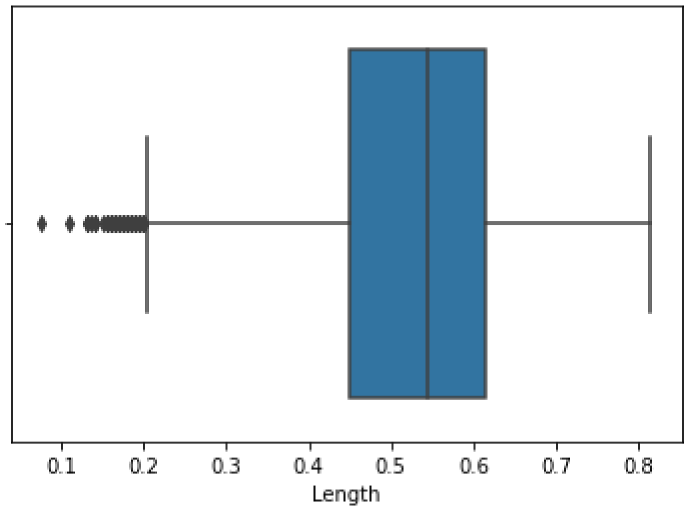
```
sns.boxplot(mydata['Rings'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7f30c649e0d0>
```



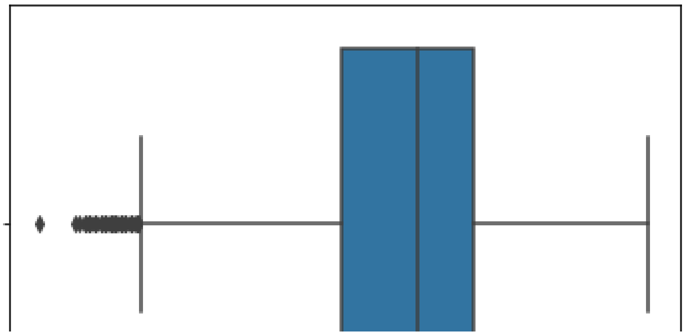

```
sns.boxplot(mydata['Length'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7f30c647c410>
```



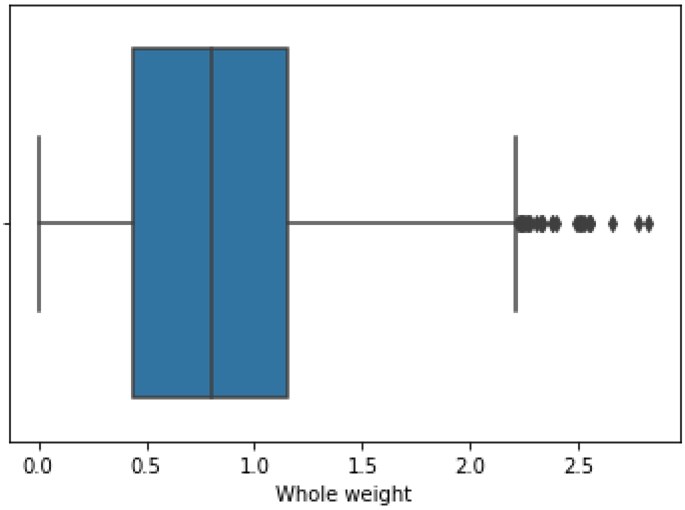

```
sns.boxplot(mydata['Diameter'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7f30c63f23d0>
```



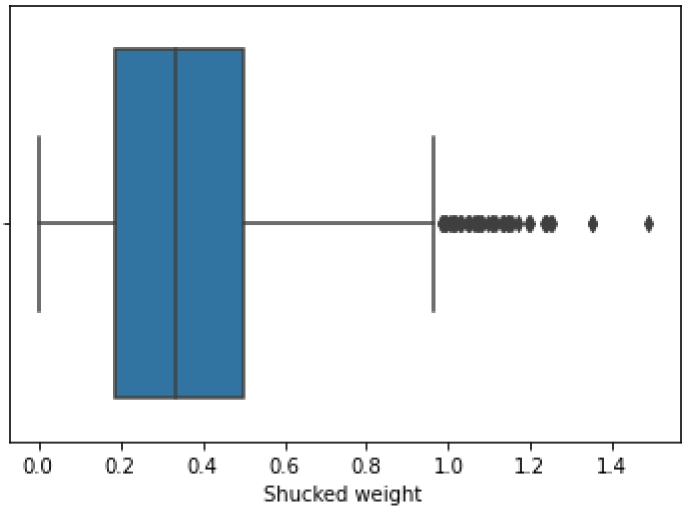
```
sns.boxplot(mydata['Whole weight'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7f30c63d15d0>
```



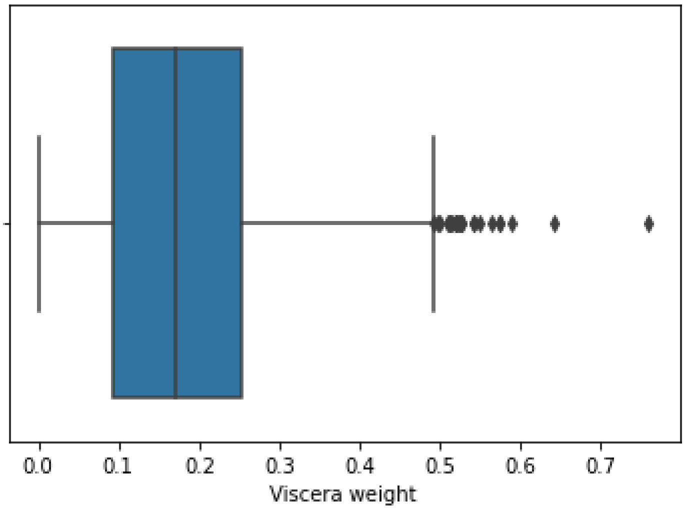

```
sns.boxplot(mydata['Shucked weight'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7f30c6336250>
```



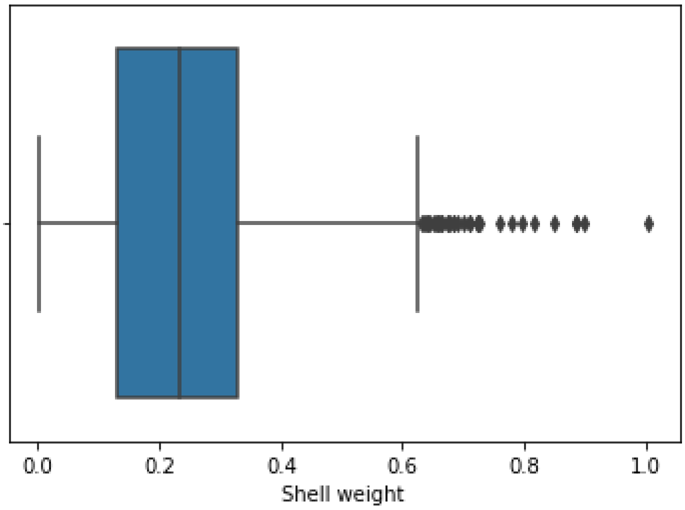
```
sns.boxplot(mydata['Viscera weight'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7f30c62b7510>
```



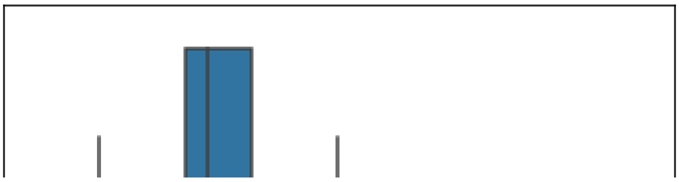

```
sns.boxplot(mydata['Shell weight'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7f30c6290bd0>
```



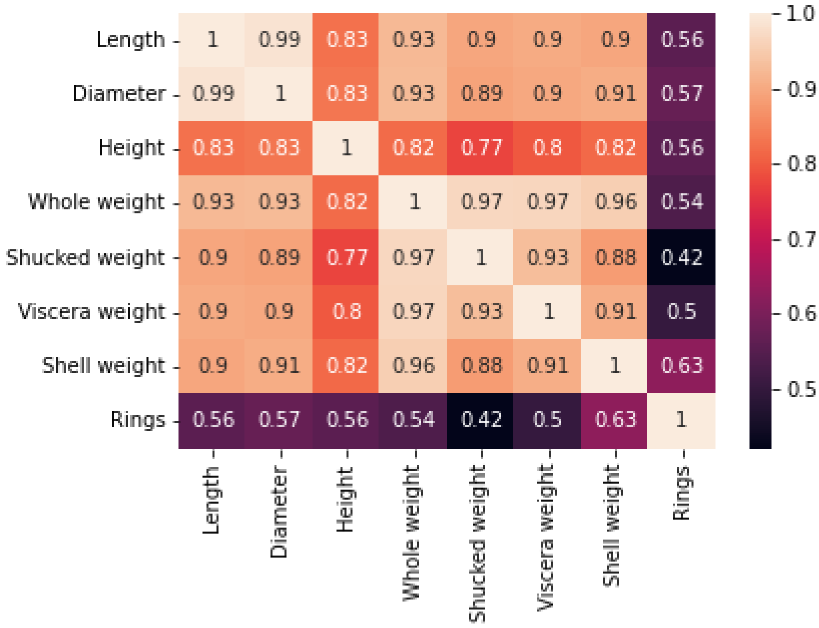

```
sns.boxplot(mydata['Rings'])
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43: FutureWarning: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7f30c61f2910>
```



```
sns.heatmap(mydata.corr(),annot=True)
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f30c6184490>
```

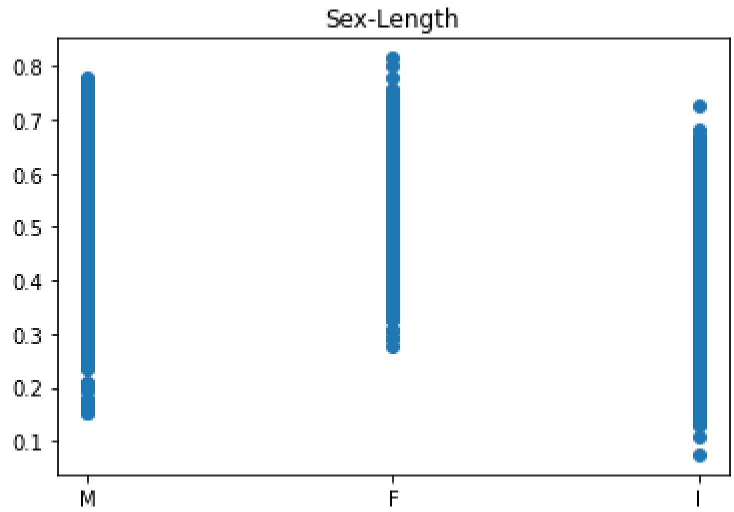


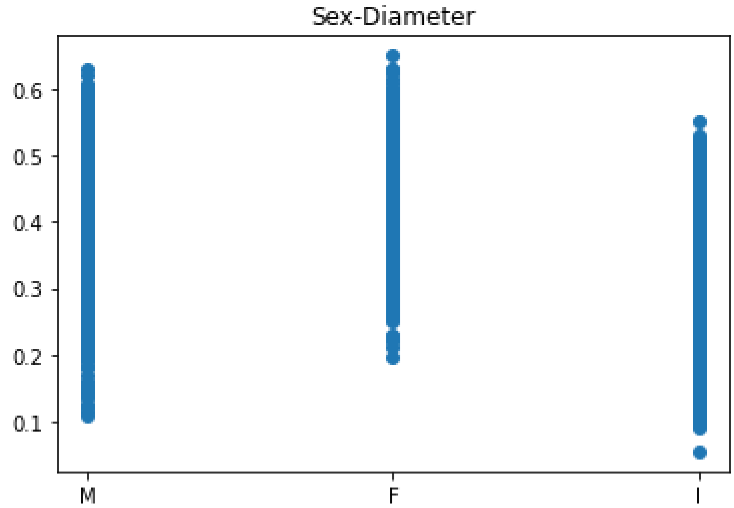

```
mydata.iloc[:,-4:-1].sum().sum(), len(mydata)
```

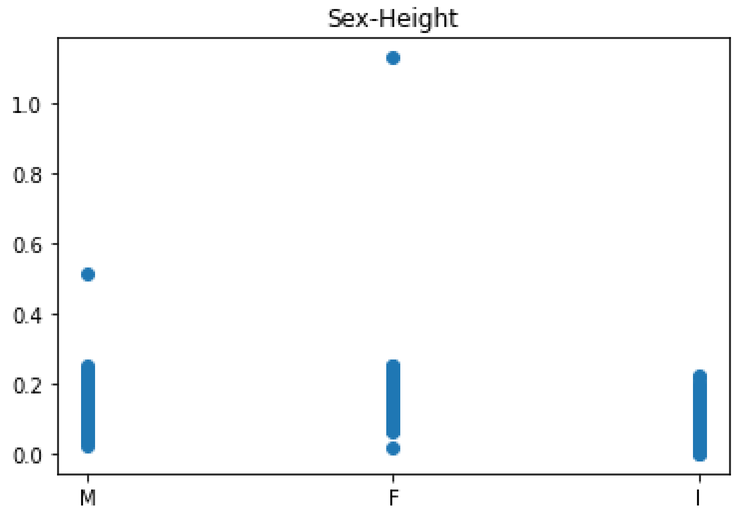
```
(3253.014, 4177)
```

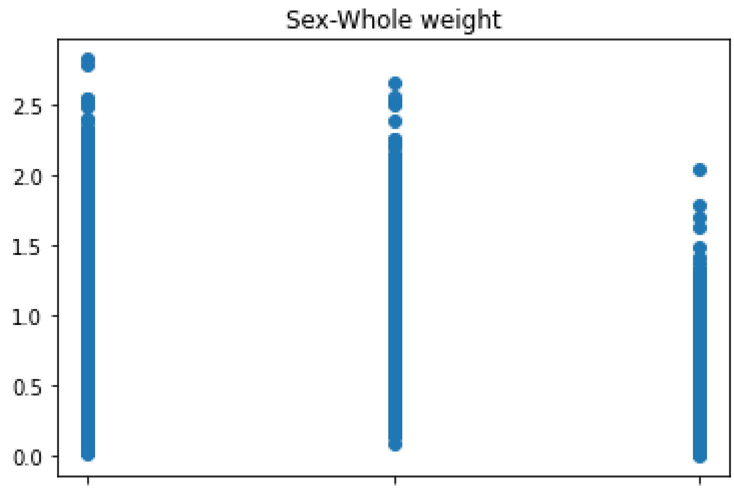
Bivariate Analysis

```
cols = list(mydata.iloc[:,:7].columns)
for i in range(len(cols)-1):
    for j in range(i+1, len(cols)):
        plt.scatter(mydata[cols[i]], mydata[cols[j]])
        plt.title(cols[i]+'-'+cols[j])
        plt.show()
```

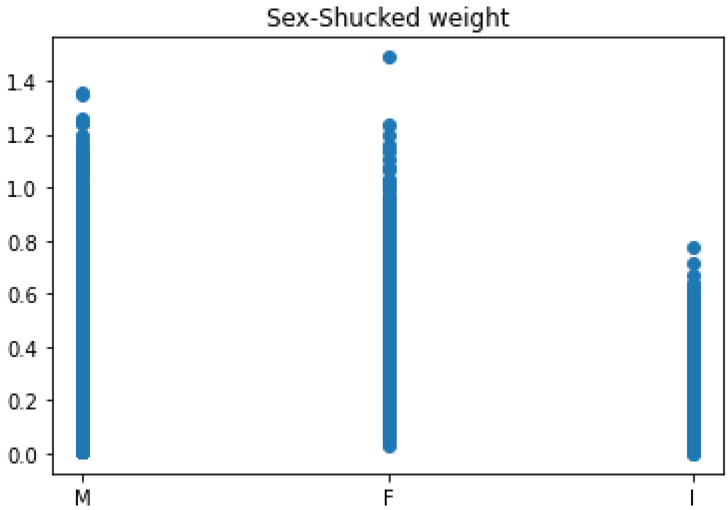

Sex-Length
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
M
F
I

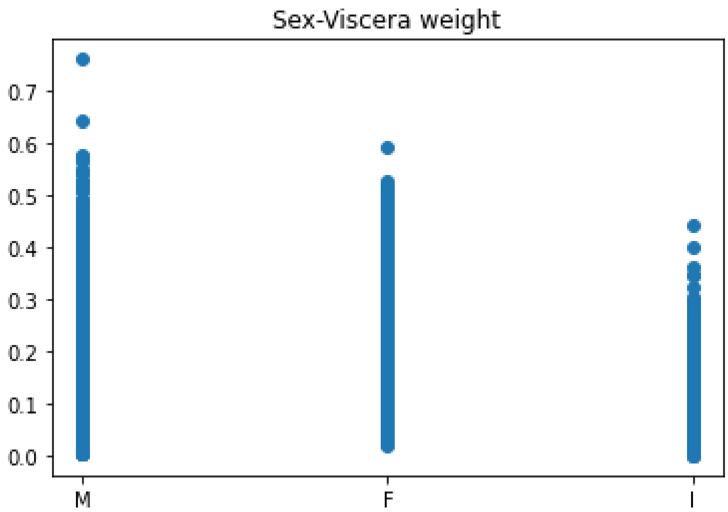

Sex-Diameter
0.6
0.5
0.4
0.3
0.2
0.1
M
F
I

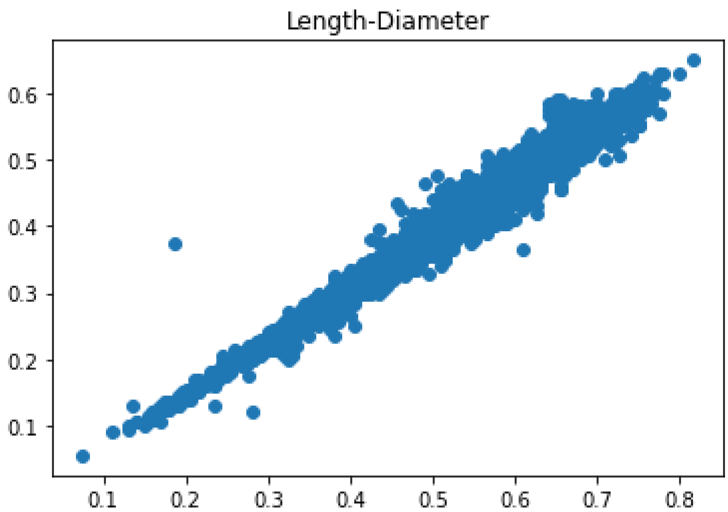

Sex-Height
1.0
0.8
0.6
0.4
0.2
0.0
M
F
I

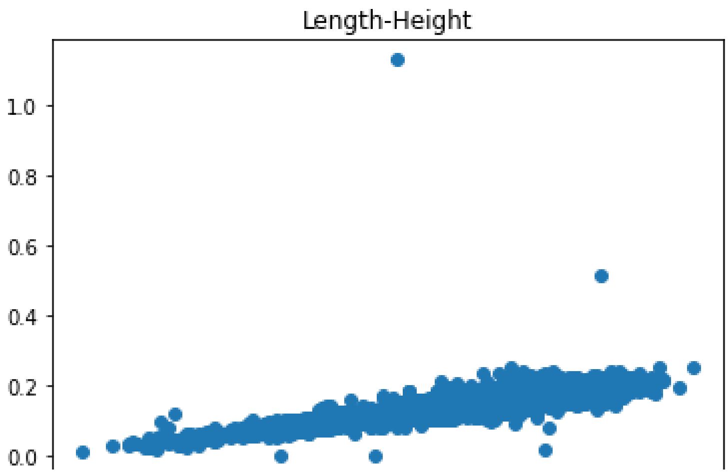

Sex-Whole weight
2.5
2.0
1.5
1.0
0.5
0.0


M
F
I

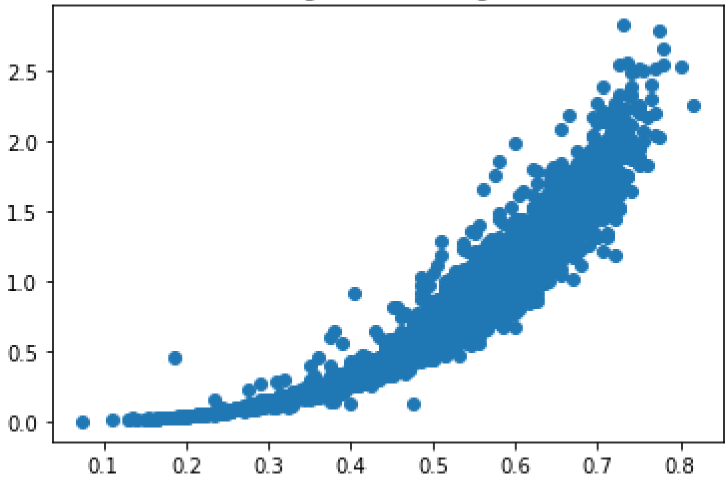

Sex-Shucked weight
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
M
F
I


Sex-Viscera weight
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
M
F
I

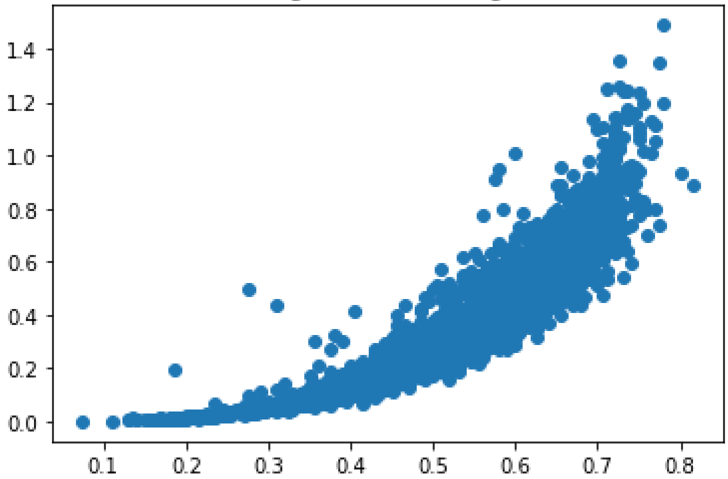

Length-Diameter
0.1
0.2
0.3
0.4
0.5
0.6
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8


Length-Height
0.0
0.2
0.4
0.6
0.8
1.0

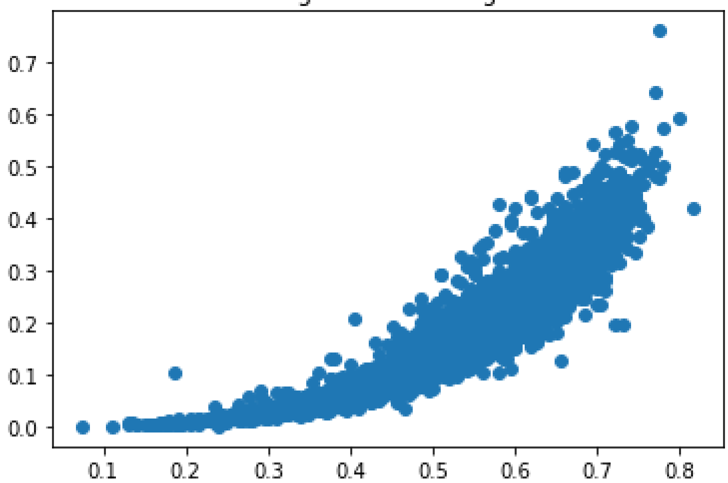
Length-Whole weight



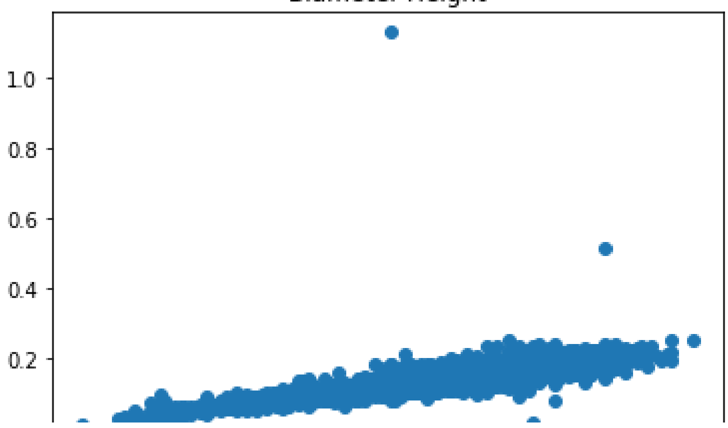
Length-Shucked weight

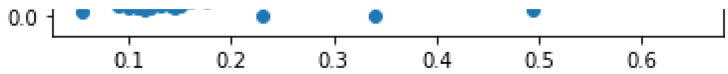


Length-Viscera weight

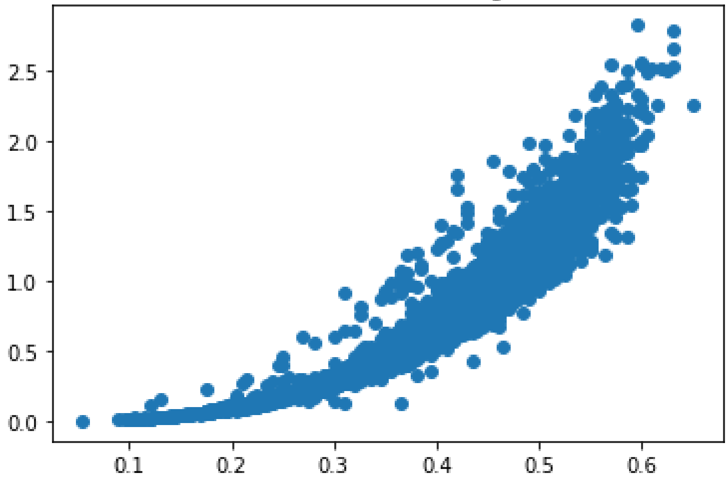


Diameter-Height

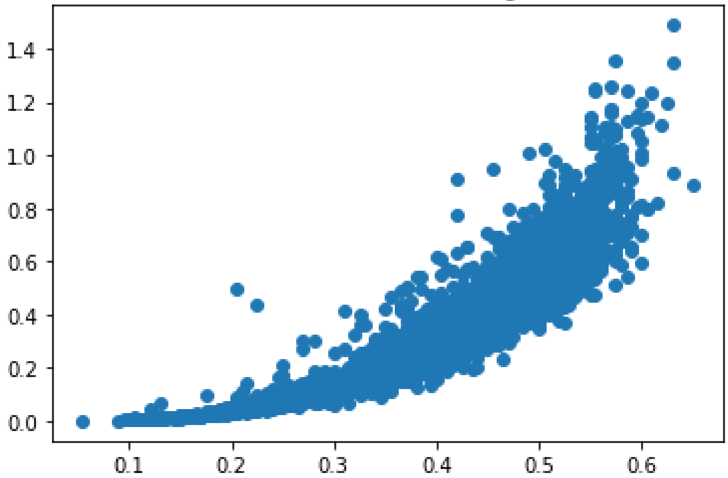




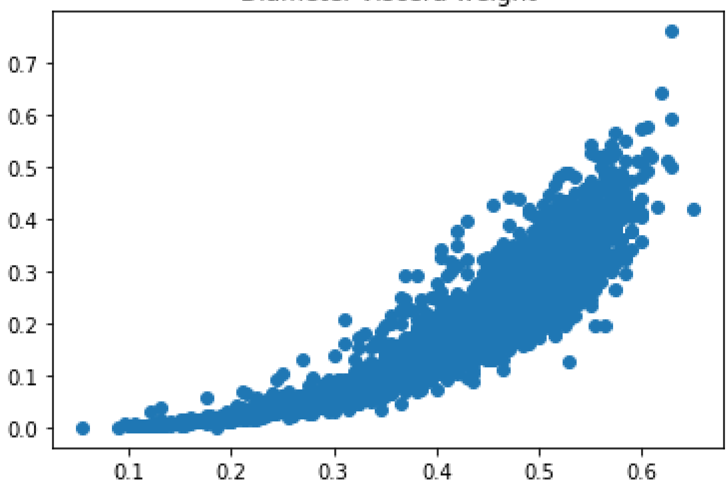
Diameter-Whole weight



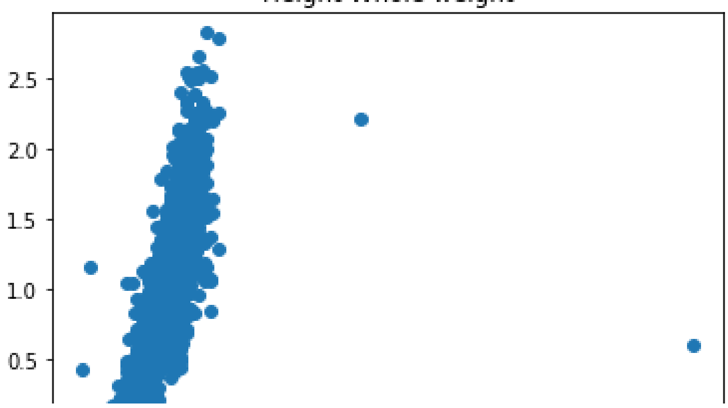
Diameter-Shucked weight

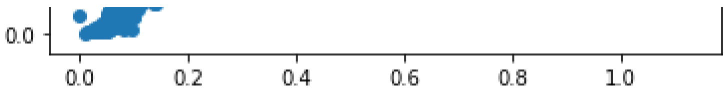


Diameter-Viscera weight

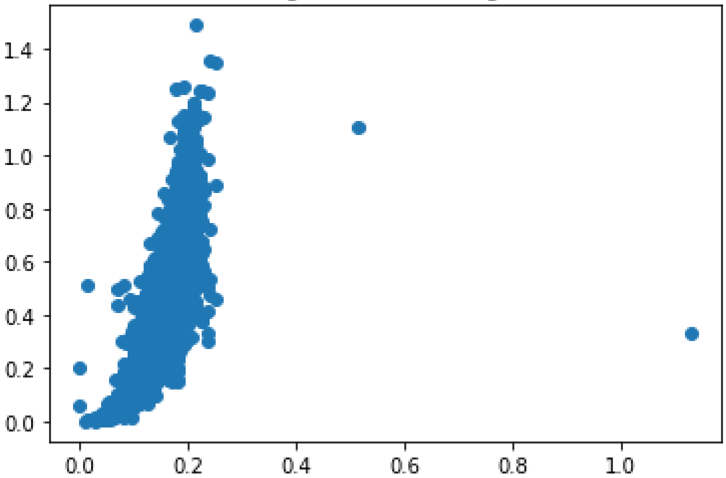


Height-Whole weight

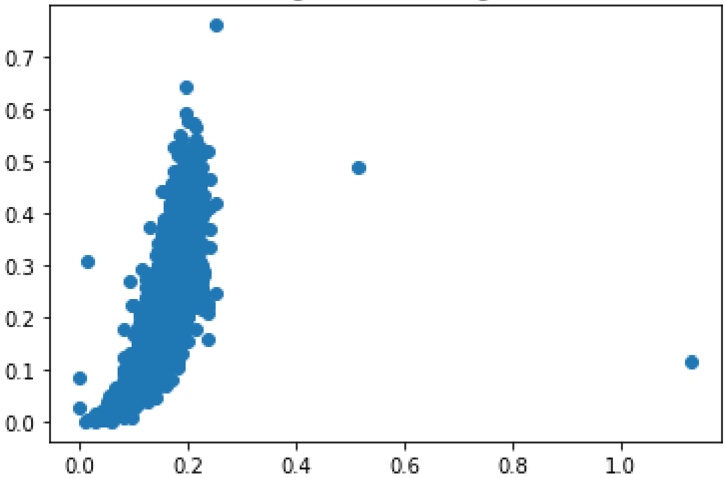




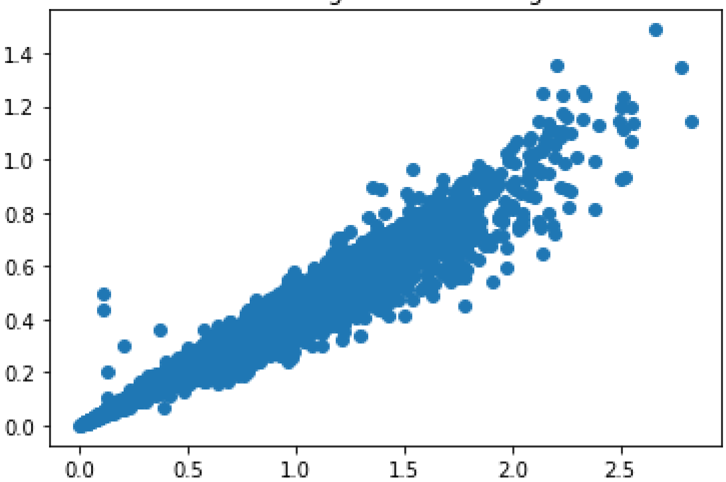
Height-Shucked weight



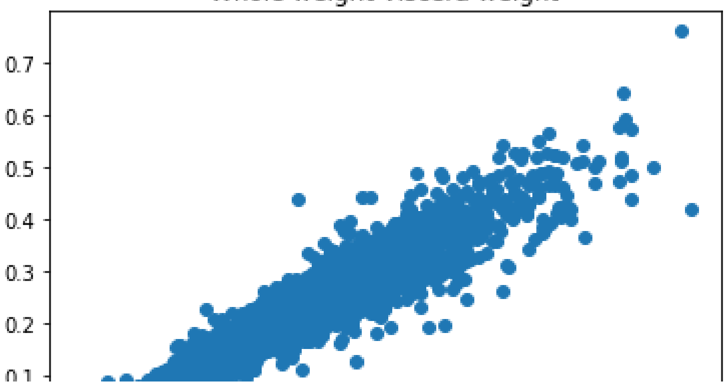
Height-Viscera weight

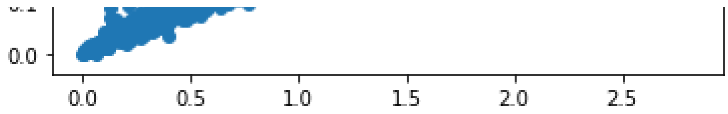


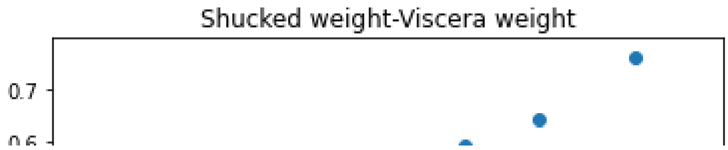
Whole weight-Shucked weight



Whole weight-Viscera weight







04.Perform Descriptive Statistics

```
mydata = pd.DataFrame()
```

```
mydata.sum()
```

```
Sex               MMFMIIFFMFFMMFFMIFMMMIFFFFFMMMMFMFFMFFFMFFIIII...
Length                                                     2188.715
Diameter                                                    1703.72
Height                                                       582.76
Whole weight                                               3461.656
Shucked weight                                             1501.078
Viscera weight                                             754.3395
Shell weight                                               997.5965
Rings                                                         41493
dtype: object
```

```
mydata.sum(1)
```

```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:1: FutureWarning: Dropp
  """Entry point for launching an IPython kernel.
0       16.9045
1        8.1485
2       11.3700
3       11.9305
4        8.0540
          ...
4172    13.9250
4173    13.0450
4174    12.5770
4175    13.4425
4176    17.2255
Length: 4177, dtype: float64
```

```
mydata.mean()
```

```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:1: FutureWarning: Dropp
  """Entry point for launching an IPython kernel.
Length            0.523992
Diameter          0.407881
Height            0.139516
Whole weight      0.828742
Shucked weight    0.359367
Viscera weight    0.180594
Shell weight      0.238831
```

```
Rings             9.933684
dtype: float64
```

```
mydata.std()
```

```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:1: FutureWarning: Dropp
  """Entry point for launching an IPython kernel.
Length            0.120093
Diameter          0.099240
Height            0.041827
Whole weight      0.490389
Shucked weight    0.221963
Viscera weight    0.109614
Shell weight      0.139203
Rings             3.224169
dtype: float64
```

```
mydata.count()
```

```
Sex               4177
Length            4177
Diameter          4177
Height            4177
Whole weight      4177
Shucked weight    4177
Viscera weight    4177
Shell weight      4177
Rings             4177
dtype: int64
```

```
mydata.min()
```

```
Sex                    F
Length             0.075
Diameter           0.055
Height               0.0
Whole weight       0.002
Shucked weight     0.001
Viscera weight    0.0005
Shell weight      0.0015
Rings                  1
dtype: object
```

```
mydata.describe
```

```
<bound method NDFrame.describe of      Sex  Length  Diameter  Height  Whole weight
Shucked weight  \
0      M   0.455     0.365   0.095        0.5140          0.2245
1      M   0.350     0.265   0.090        0.2255          0.0995
2      F   0.530     0.420   0.135        0.6770          0.2565
3      M   0.440     0.365   0.125        0.5160          0.2155
4      I   0.330     0.255   0.080        0.2050          0.0895
...   ..     ...       ...     ...           ...             ...
4172   F   0.565     0.450   0.165        0.8870          0.3700
4173   M   0.590     0.440   0.135        0.9660          0.4390
```

```
4174   M   0.600     0.475   0.205        1.1760          0.5255
4175   F   0.625     0.485   0.150        1.0945          0.5310
4176   M   0.710     0.555   0.195        1.9485          0.9455

      Viscera weight  Shell weight  Rings
0             0.1010        0.1500     15
1             0.0485        0.0700      7
2             0.1415        0.2100      9
3             0.1140        0.1550     10
4             0.0395        0.0550      7
...              ...           ...    ...
4172          0.2390        0.2490     11
4173          0.2145        0.2605     10
4174          0.2875        0.3080      9
4175          0.2610        0.2960     10
4176          0.3765        0.4950     12

[4177 rows x 9 columns]>
```

05.Handling Missig Values

```
mydata.duplicated().sum()
```

```
0
```

```
mydata.isna().sum()
```

```
Sex               0
Length            0
Diameter          0
Height            0
Whole weight      0
Shucked weight    0
Viscera weight    0
Shell weight      0
Rings             0
dtype: int64
```

```
mydata.nunique()
```

```
Sex                  3
Length             134
Diameter           111
Height              51
Whole weight      2429
Shucked weight    1515
Viscera weight     880
Shell weight       926
Rings               28
dtype: int64
```

```
mydata.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
```

```
mydata.drop(columns=['Whole weight','Shucked weight','Viscera weight','Shell weight']).des
```

	Length	Diameter	Height	Rings
count	4177.000000	4177.000000	4177.000000	4177.000000
mean	0.523992	0.407881	0.139516	9.933684
std	0.120093	0.099240	0.041827	3.224169
min	0.075000	0.055000	0.000000	1.000000
25%	0.450000	0.350000	0.115000	8.000000
50%	0.545000	0.425000	0.140000	9.000000
75%	0.615000	0.480000	0.165000	11.000000
max	0.815000	0.650000	1.130000	29.000000

```
qnt=mydata.drop(columns=['Shucked weight','Viscera weight','Shell weight'])
```

06.Find Outliers

```
qnt=mydata.drop(columns=['Sex','Viscera weight','Shucked weight']).quantile(q=[0.015,0.05
qnt
```

	Length	Diameter	Height	Whole weight	Shell weight	Rings
0.015	0.215	0.1582	0.050	0.04932	0.0150	4.0
0.050	0.295	0.2200	0.075	0.12590	0.0384	6.0
0.080	0.335	0.2500	0.080	0.17954	0.0550	6.0

```
Q1=qnt.iloc[0]
Q4=qnt.iloc[1]
Q7=qnt.iloc[2]
```

```
iqr=Q4-Q1
iqr
```

```
Length          0.08000
Diameter        0.06180
Height          0.02500
Whole weight    0.07658
Shell weight    0.02340
Rings           2.00000
dtype: float64
```

```
iqr=Q7-Q1
iqr
```

```
Length          0.12000
Diameter        0.09180
Height          0.03000
Whole weight    0.13022
Shell weight    0.04000
Rings           2.00000
dtype: float64
```

```
upper=qnt.iloc[2]+1.5*iqr
upper
```

```
Length          0.51500
Diameter        0.38770
Height          0.12500
Whole weight    0.37487
Shell weight    0.11500
Rings           9.00000
dtype: float64
```

```
lower=qnt.iloc[0]-1.5*iqr
lower
```

```
Length          0.03500
Diameter        0.02050
Height          0.00500
Whole weight   -0.14601
Shell weight   -0.04500
Rings           1.00000
dtype: float64
```

```
medium=qnt.iloc[1]-1.5*iqr
medium
```

```
Length          0.11500
Diameter        0.08230
Height          0.03000
Whole weight   -0.06943
Shell weight   -0.02160
Rings           3.00000
dtype: float64
```

Replace Outliers

```
mydata['Rings']= np.where(mydata['Rings']>11.2,9.933684,mydata['Rings'])
mydata['Whole weight']= np.where(mydata['Whole weight']>3.1,2.825500,mydata['Whole weight'
```

07.Categorical Columns

```
mydata['Sex'].replace({'M': 1, 'F':0,'I':2}, inplace=True)
mydata.head(10)
```

	Sex	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight	Shell weight	Rings
0	1	0.455	0.365	0.095	0.5140	0.2245	0.1010	0.150	9.933684
1	1	0.350	0.265	0.090	0.2255	0.0995	0.0485	0.070	7.000000
2	0	0.530	0.420	0.135	0.6770	0.2565	0.1415	0.210	9.000000
3	1	0.440	0.365	0.125	0.5160	0.2155	0.1140	0.155	10.000000
4	2	0.330	0.255	0.080	0.2050	0.0895	0.0395	0.055	7.000000
5	2	0.425	0.300	0.095	0.3515	0.1410	0.0775	0.120	8.000000
6	0	0.530	0.415	0.150	0.7775	0.2370	0.1415	0.330	9.933684
7	0	0.545	0.425	0.125	0.7680	0.2940	0.1495	0.260	9.933684
8	1	0.475	0.370	0.125	0.5095	0.2165	0.1125	0.165	9.000000
9	0	0.550	0.440	0.150	0.8945	0.3145	0.1510	0.320	9.933684

Perform Encoding

```
mydata_all = mydata.drop(columns="Rings")
target = mydata['Rings']
```

```
mydata_all = pd.get_dummies(mydata_all)
mydata_all.columns
```

```
Index(['Sex', 'Length', 'Diameter', 'Height', 'Whole weight', 'Shucked weight',
       'Viscera weight', 'Shell weight'],
      dtype='object')
```

```
mydata_all.shape
```

```
(4177, 8)
```

```
target.value_counts()
```

```
9.933684     960
9.000000     689
```

```
10.000000    634
8.000000     568
11.000000    487
7.000000     391
6.000000     259
5.000000     115
4.000000      57
3.000000      15
1.000000       1
2.000000       1
Name: Rings, dtype: int64
```

Dropping Unwanted Columns

```
mydata =mydata.drop(columns=['Length'])
mydata.head()
```

	Sex	Diameter	Height	Whole weight	Shucked weight	Viscera weight	Shell weight	Rings
0	1	0.365	0.095	0.5140	0.2245	0.1010	0.150	9.933684
1	1	0.265	0.090	0.2255	0.0995	0.0485	0.070	7.000000
2	0	0.420	0.135	0.6770	0.2565	0.1415	0.210	9.000000
3	1	0.365	0.125	0.5160	0.2155	0.1140	0.155	10.000000
4	2	0.255	0.080	0.2050	0.0895	0.0395	0.055	7.000000

08.Split the Data into Depenent and Indepenent Variable

```
Y= mydata['Rings']
mydata = mydata.drop(['Rings'], axis = 1)
Y= mydata
```

```
X=mydata.iloc[:,:-1]
X.head()
```

	Sex	Diameter	Height	Whole weight	Shucked weight	Viscera weight
0	1	0.365	0.095	0.5140	0.2245	0.1010
1	1	0.265	0.090	0.2255	0.0995	0.0485
2	0	0.420	0.135	0.6770	0.2565	0.1415
3	1	0.365	0.125	0.5160	0.2155	0.1140
4	2	0.255	0.080	0.2050	0.0895	0.0395

```
Y=mydata.iloc[:,-1]
Y.head()
```

```
0    0.150
```

```
1    0.070
2    0.210
3    0.155
4    0.055
Name: Shell weight, dtype: float64
```

09.Scale The Independent Variables

```
from sklearn.preprocessing import StandardScaler
```

```
cls=StandardScaler()
X=cls.fit_transform(X)
```

```
X
```

```
array([[-0.0105225 , -0.43214879, -1.06442415, -0.64189823, -0.60768536,
        -0.72621157],
       [-0.0105225 , -1.439929  , -1.18397831, -1.23027711, -1.17090984,
        -1.20522124],
       [-1.26630752,  0.12213032, -0.10799087, -0.30946926, -0.4634999 ,
        -0.35668983],
       ...,
       [-0.0105225 ,  0.67640943,  1.56576738,  0.70821206,  0.74855917,
         0.97541324],
       [-1.26630752,  0.77718745,  0.25067161,  0.54199757,  0.77334105,
         0.73362741],
       [-0.0105225 ,  1.48263359,  1.32665906,  2.28368063,  2.64099341,
         1.78744868]])
```

10.Split Data Into Training and Testing

```
from sklearn.model_selection import train_test_split
```

```
X_train,X_test,Y_train,Y_test= train_test_split(X,Y,test_size=0.4,random_state=0)
print('train data points :', len(X_train))
print('test data points :', len(X_test))
```

```
train data points : 2506
test data points : 1671
```

```
X_train.shape
```

```
(2506, 6)
```

```
X_test.shape
```

```
(1671, 6)
```

```
X_train
```

```
array([[ 1.24526253, -2.14537514, -1.78174911, -1.47399037, -1.37592355,
        -1.46525506],
       [-0.0105225 , -0.73448285, -0.34709919, -0.77752109, -0.64373173,
        -0.49811173],
       [-0.0105225 ,  0.82757646,  0.72888826,  0.7051529 ,  0.74855917,
         0.84311534],
       ...,
       [-0.0105225 ,  0.42446438,  0.13111745,  0.26565325,  0.46694694,
         0.23636976],
       [-1.26630752,  0.82757646,  0.6093341 ,  0.60827942,  0.53002808,
         0.51008957],
       [ 1.24526253, -0.83526087, -0.70576167, -1.02531323, -1.02221858,
        -0.96343541]])
```

```
X_test
```

```
array([[-0.0105225 ,  0.21659075,  0.17251933, ...,  0.18101643,
        -0.36887819,  0.56939553],
       [ 1.24526253, -0.1998034 , -0.07942572, ..., -0.43387519,
        -0.44322382, -0.34300384],
       [-0.0105225 ,  0.79954256,  0.72679844, ...,  0.87034766,
         0.75531787,  1.7646387 ],
       ...,
       [ 1.24526253,  0.67462432,  0.62602042, ...,  0.22486442,
        -0.09402464,  0.18618779],
       [-0.0105225 ,  0.46642724,  0.47485339, ..., -0.06779544,
         0.20561078, -0.12402799],
       [ 1.24526253, -1.61554351, -1.69187405, ..., -1.3577422 ,
        -1.28355474, -1.34664314]])
```

11.Build the Model

1.Linear Regression

```
from sklearn.linear_model import LinearRegression
```

```
lm = LinearRegression()
lm.fit(X_train, Y_train)
```

```
LinearRegression()
```

```
Y_train_pred = lm.predict(X_train)
Y_test_pred = lm.predict(X_test)
```

```
from sklearn.metrics import mean_absolute_error, mean_squared_error
```

```
s = mean_squared_error(Y_train, Y_train_pred)
print('Mean Squared error of training set :%2f'%s)

p = mean_squared_error(Y_test, Y_test_pred)
print('Mean Squared error of testing set :%2f'%p)
```

```
Mean Squared error of training set :0.000995
Mean Squared error of testing set :0.000791
```

```
from sklearn.metrics import r2_score
s = r2_score(Y_train, Y_train_pred)
print('R2 Score of training set:%.2f'%s)

p = r2_score(Y_test, Y_test_pred)
print('R2 Score of testing set:%.2f'%p)
```

```
R2 Score of training set:0.95
R2 Score of testing set:0.96
```

2.Ridge

```
from sklearn.linear_model import Ridge
```

```
ridge_mod = Ridge(alpha=0.01, normalize=True)
ridge_mod.fit(X_train, Y_train)
ridge_mod.fit(X_test, Y_test)
ridge_model_pred = ridge_mod.predict(X_test)
ridge_mod.score(X_train, Y_train)
```

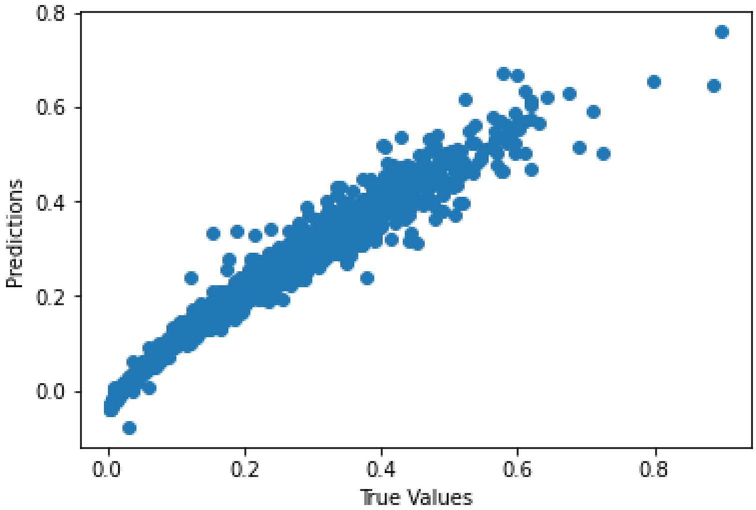
```
/usr/local/lib/python3.7/dist-packages/sklearn/linear_model/_base.py:145: FutureWarn
If you wish to scale the data, use Pipeline with a StandardScaler in a preprocessing

from sklearn.pipeline import make_pipeline

model = make_pipeline(StandardScaler(with_mean=False), Ridge())

If you wish to pass a sample_weight parameter, you need to pass it as a fit paramete

kwargs = {s[0] + '__sample_weight': sample_weight for s in model.steps}
model.fit(X, y, **kwargs)

Set parameter alpha to: original_alpha * n_samples.
  FutureWarning,
/usr/local/lib/python3.7/dist-packages/sklearn/linear_model/_base.py:145: FutureWarn
If you wish to scale the data, use Pipeline with a StandardScaler in a preprocessing

from sklearn.pipeline import make_pipeline

model = make_pipeline(StandardScaler(with_mean=False), Ridge())

If you wish to pass a sample_weight parameter, you need to pass it as a fit paramete

kwargs = {s[0] + '__sample_weight': sample_weight for s in model.steps}
model.fit(X, y, **kwargs)

Set parameter alpha to: original_alpha * n_samples.
  FutureWarning,
0.9290023156453548
```

```
ridge_mod.score(X_test, Y_test)
```

    0.9519921522913208

```
plt.scatter(Y_test, ridge_model_pred)
plt.xlabel('True Values')
plt.ylabel('Predictions')
```

    Text(0, 0.5, 'Predictions')



3.Support Vector Regression

```
from sklearn.svm import SVR
```

```
svr = SVR(kernel = 'linear')
svr.fit(X_train, Y_train)
svr.fit(X_test, Y_test)
```

    SVR(kernel='linear')

```
Y_train_pred = svr.predict(X_train)
Y_test_pred = svr.predict(X_test)
svr.score(X_train, Y_train)
```

    0.8922092465754603

```
svr.score(X_test, Y_test)
```

    0.93330364267072

4.Random Forest Regression

```
from sklearn.ensemble import RandomForestRegressor
```