Assignment -3

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Maximum Marks	2 Marks

Input

```
import numpy as np
import pandas as pd

df=pd.read_csv('abalone.csv')
df.head()
```

Output

	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

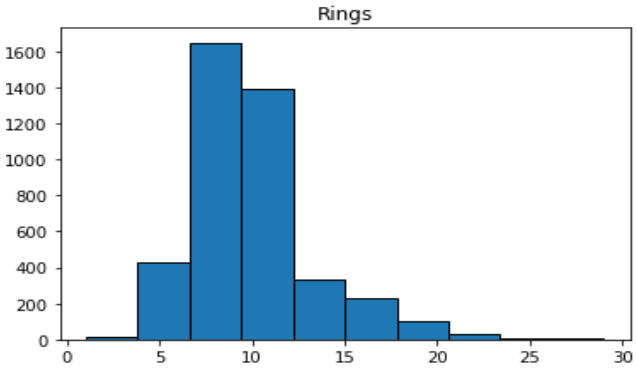
Input

```
import matplotlib.pyplot as plt
import seaborn as sns

df.hist(column='Rings',grid=False,edgecolor='black')
```

Output

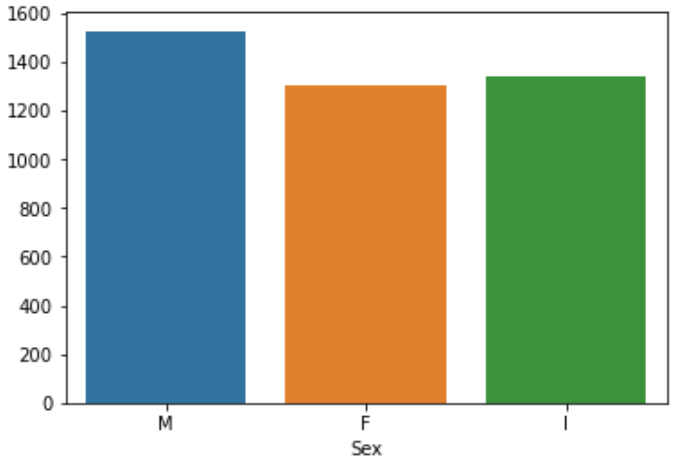
```
array([[]],
      dtype=object)
```



Input

```
sns.countplot(x='Sex',data=df)
```

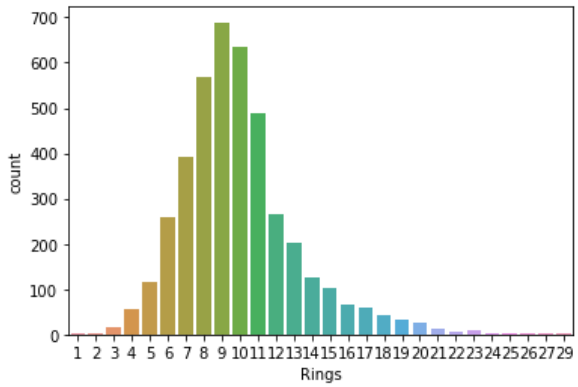
Output



Input

```
sns.countplot(x="Rings",data=df)
```

Output



Input

```
df.describe()
```

Output

	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight	Shell weight	Rings
count	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000	4177.000000
mean	0.523992	0.407881	0.139516	0.828742	0.359367	0.180594	0.238831	9.933684
std	0.120093	0.099240	0.041827	0.490389	0.221963	0.109614	0.139203	3.224169
min	0.075000	0.055000	0.000000	0.002000	0.001000	0.000500	0.001500	1.000000
25%	0.450000	0.350000	0.115000	0.441500	0.186000	0.093500	0.130000	8.000000
50%	0.545000	0.425000	0.140000	0.799500	0.336000	0.171000	0.234000	9.000000
75%	0.615000	0.480000	0.165000	1.153000	0.502000	0.253000	0.329000	11.000000
max	0.815000	0.650000	1.130000	2.825500	1.488000	0.760000	1.005000	29.000000

Input

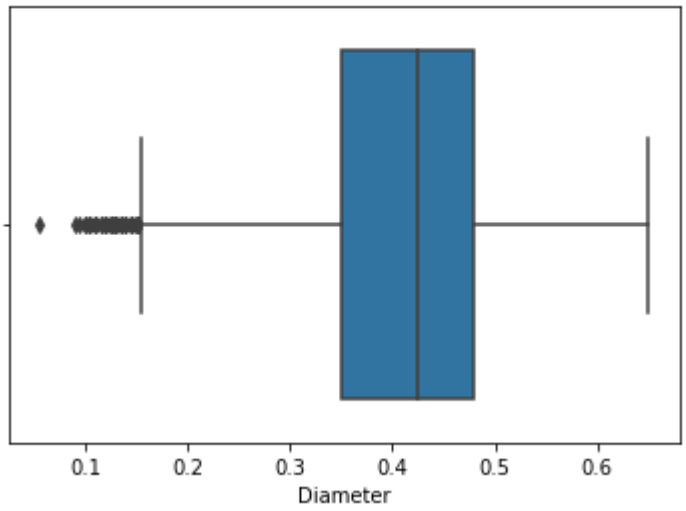
```
df.info()
```

```
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
```

Input

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

Output



Input

```
outliers=np.where(df['Rings']>3)

outliers
```

Output

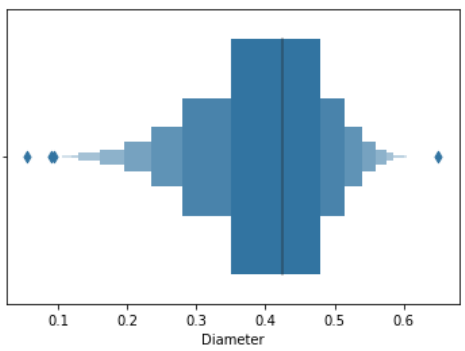
```
(array([   0,    1,    2, ..., 4174, 4175, 4176], dtype=int64),)
```

Input

```
for i in outliers:
    df['Rings'][i]=3

sns.boxenplot(df['Diameter'])
```

Output



Input

```
from sklearn.preprocessing import LabelEncoder
le=LabelEncoder()


df["Length"]=le.fit_transform(df["Length"])
df['Diameter']=le.fit_transform(df['Diameter'])
df['Height']=le.fit_transform(df['Height'])


df.head()
```

Output

	Sex	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight	Shell weight	Rings
0	M	66	56	18	0.5140	0.2245	0.1010	0.150	3
1	M	45	36	17	0.2255	0.0995	0.0485	0.070	3
2	F	81	67	26	0.6770	0.2565	0.1415	0.210	3
3	M	63	56	24	0.5160	0.2155	0.1140	0.155	3
4	I	41	34	15	0.2050	0.0895	0.0395	0.055	3

Input

```
x=df.iloc[:, 1:9]
y=df.iloc[:, 8]


x=x.drop(['Length','Height'],axis=1)
x
```

Output

	Diameter	Whole weight	Shucked weight	Viscera weight	Shell weight	Rings
0	56	0.5140	0.2245	0.1010	0.1500	3
1	36	0.2255	0.0995	0.0485	0.0700	3
2	67	0.6770	0.2565	0.1415	0.2100	3
3	56	0.5160	0.2155	0.1140	0.1550	3
4	34	0.2050	0.0895	0.0395	0.0550	3
...	...	...	...	...	...	...
4172	73	0.8870	0.3700	0.2390	0.2490	3
4173	71	0.9660	0.4390	0.2145	0.2605	3
4174	78	1.1760	0.5255	0.2875	0.3080	3
4175	80	1.0945	0.5310	0.2610	0.2960	3
4176	94	1.9485	0.9455	0.3765	0.4950	3

4177 rows × 6 columns

Input

```
y
```

Output

```
0        3
```

```
1       3
2       3
3       3
4       3
       ..
4172    3
4173    3
4174    3
4175    3
4176    3
Name: Rings, Length: 4177, dtype: int64
```

Input

```
from sklearn.model_selection import train_test_split

xtrain,xtest,ytrain,ytest=train_test_split(x,y,test_size=0.3,random_state=0)

xtrain.shape
xtest.shape
```

Output

```
(1254, 6)
```

Input

```
from sklearn.linear_model import LinearRegression

l=LinearRegression()
l.fit(xtrain,ytrain)
```

Output

```
LinearRegression()
```

Input

```
ypred=l.predict(xtest)

ypred
```

Output

```
array([3.00036065, 3.00036065, 3.00036065, ..., 3.00036065, 3.00036065,
       3.00036065])
```

Input

```
from sklearn import metrics

metrics.mean_absolute_error(ytest,ypred)
```

Output

```
0.0006075048987421218
```

Input

```
metrics.mean_squared_error(ytest,ypred)
```

Output

```
7.67236335876925e-05
```

Input

```
np.sqrt(metrics.mean_squared_error(ytest,ypred))
```

Output

```
0.008759202794072786
```