

ASSIGNMENT 4

Assignment Date	29 oct 2022
Student Name	S.Poovarasana
Student Roll Number	420619106009
Maximum Mark	2

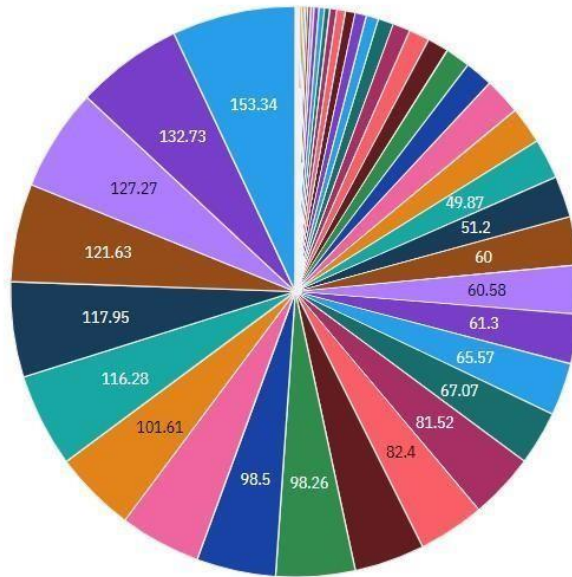
1. Download the dataset: [Dataset](#)
2. Load the dataset into the tool.
3. Perform Below Visualizations.
 - Univariate Analysis
 - Bi-Variate Analysis
 - Multi-Variate Analysis
4. Perform descriptive statistics on the dataset.
5. Check for Missing values and deal with them.
6. Find the outliers and replace them outliers
7. Check for Categorical columns and perform encoding. 8. Split the data into dependent and independent variables. 9. Scale the independent variables
10. Split the data into training and testing
11. Build the Model
12. Train the Model
13. Test the Model

Univariate Analysis

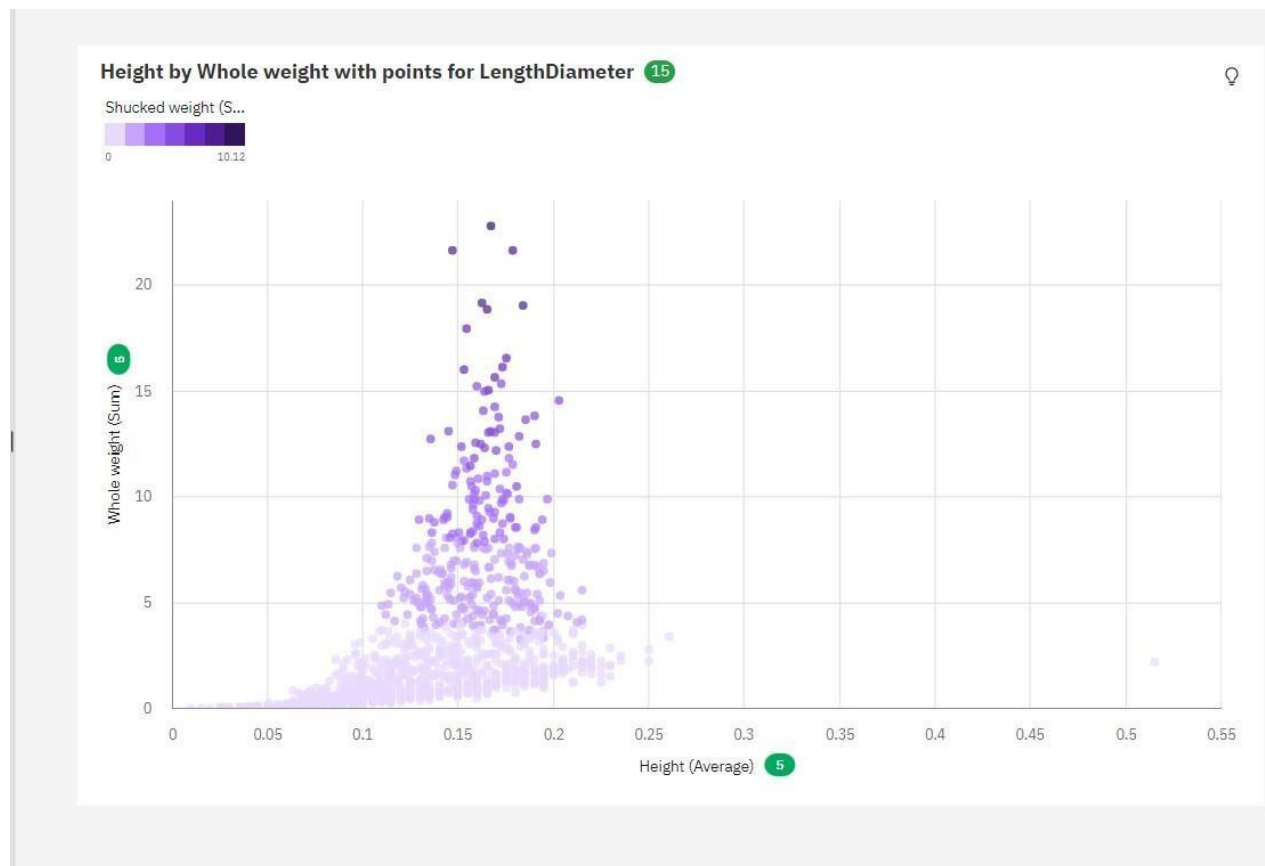
Length by Height 10

Height

0.01 0.02 1.13 0.52 0 0.02 0.03 0.04 0.03 0.25 0.05 0.04 0.24 0.24 0.05 0.06 0.23 0.06
0.23 0.07 0.22 0.07 0.21 0.08 0.22 0.08 0.09 0.21 0.1 0.2 0.09 0.11 0.2 0.1 0.11 0.12
0.19 0.19 0.12 0.18 0.13 0.17 0.14 0.13 0.15 0.17 0.14 0.16 0.16 0.18 0.15

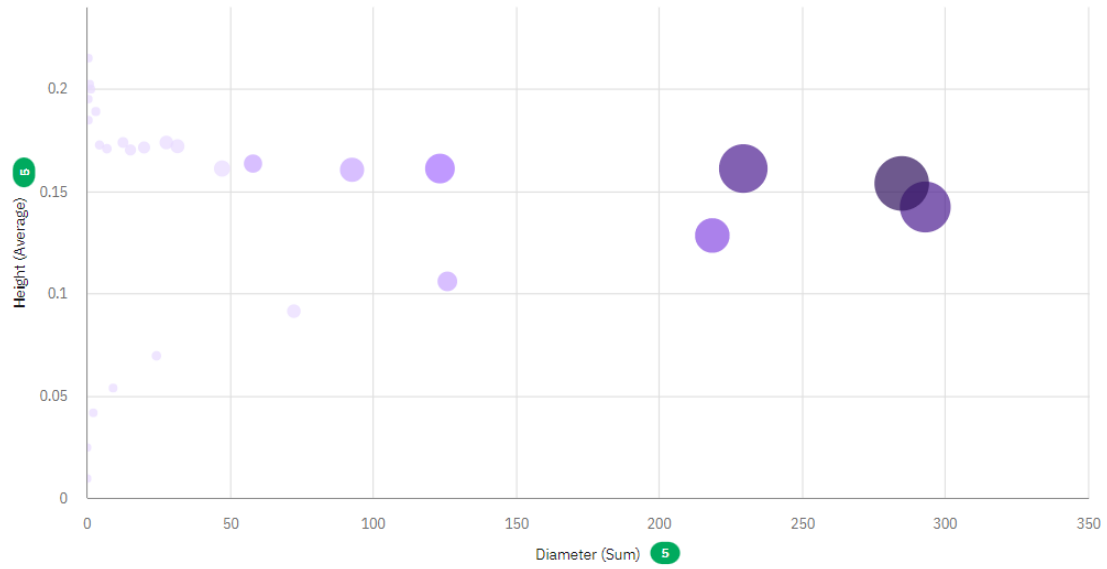
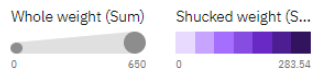


Bi variate Analysis



Multi Variate Analysis

Diameter and Height with Whole weight and Shucked weight for Rings 15



```
import pandas as pd
import numpy as np
import sklearn as sk
```

```
#loading the data
```

```
data = pd.read_csv('/content/abalone.csv')
```

```
data.head()
```

	Sex	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight \
0	M	0.455	0.365	0.095	0.5140	0.2245	0.1010
1	M	0.350	0.265	0.090	0.2255	0.0995	0.0485
2	F	0.530	0.420	0.135	0.6770	0.2565	0.1415
3	M	0.440	0.365	0.125	0.5160	0.2155	0.1140
4	I	0.330	0.255	0.080	0.2050	0.0895	0.0395

	Shell weight	Rings
0	0.150	15
1	0.070	7
2	0.210	9
3	0.155	10
4	0.055	7

```
data.tail()
```

	Sex	Length	Diameter	Height	Whole weight	Shucked weight \
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
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

```
data.shape
```

```
(4177, 9)
```

data preprocessing

```
#missing values
```

```
data.isnull().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
```

```
# remove unwanted columns
```

```
data = data.drop(columns = ['Sex'],axis = 1)
```

```
data.head()
```

	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight \
0	0.455	0.365	0.095	0.5140	0.2245	0.1010
1	0.350	0.265	0.090	0.2255	0.0995	0.0485
2	0.530	0.420	0.135	0.6770	0.2565	0.1415
3	0.440	0.365	0.125	0.5160	0.2155	0.1140
4	0.330	0.255	0.080	0.2050	0.0895	0.0395

	Shell weight	Rings
0	0.150	15
1	0.070	7
2	0.210	9
3	0.155	10
4	0.055	7

```
# deal with outlier
```

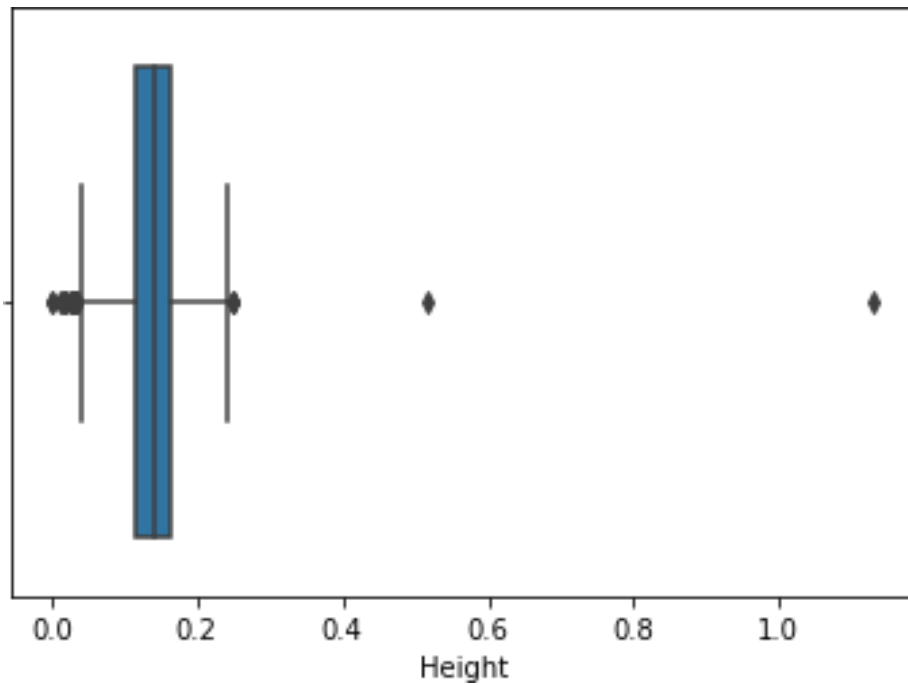
```
import seaborn as sns
sns.boxplot(data.Height)
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/_decorators.py:43:
FutureWarning: Pass the following variable as a keyword arg: x. From
version 0.12, the only valid positional argument will be `data`, and
passing other arguments without an explicit keyword will result in an
```

error or misinterpretation.

FutureWarning

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f7f76a2a810>
```



Encoding

```
pd.get_dummies(data['Height'])
```

[illegible]

```

0
4175      0      0      0      0      0      0      0      0      0      0
0
4176      0      0      0      0      0      0      0      0      0      0
0

```

```

      ...  0.210  0.215  0.220  0.225  0.230  0.235  0.240  0.250
0.515  \
0      ...      0      0      0      0      0      0      0      0
0
1      ...      0      0      0      0      0      0      0      0
0
2      ...      0      0      0      0      0      0      0      0
0
3      ...      0      0      0      0      0      0      0      0
0
4      ...      0      0      0      0      0      0      0      0
0
...      ...      ...      ...      ...      ...      ...      ...      ...
..
4172    ...      0      0      0      0      0      0      0      0
0
4173    ...      0      0      0      0      0      0      0      0
0
4174    ...      0      0      0      0      0      0      0      0
0
4175    ...      0      0      0      0      0      0      0      0
0
4176    ...      0      0      0      0      0      0      0      0
0

```

```

      1.130
0      0
1      0
2      0
3      0
4      0
...      ...
4172      0
4173      0
4174      0
4175      0
4176      0

```

```
[4177 rows x 51 columns]
```

```

# scaling
from sklearn.preprocessing import MinMaxScaler

scale = MinMaxScaler(feature_range=(0,1))

```



```

y = data['Rings']
x = data.drop(columns=['Rings'],axis = 1)

names = x.columns
names

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

x = scale.fit_transform(x)
x

array([[0.51351351, 0.5210084 , 0.0840708 , ..., 0.15030262, 0.1323239
,
      0.14798206],
      [0.37162162, 0.35294118, 0.07964602, ..., 0.06624075,
0.06319947,
      0.06826109],
      [0.61486486, 0.61344538, 0.11946903, ..., 0.17182246,
0.18564845,
      0.2077728 ],
      ...,
      [0.70945946, 0.70588235, 0.18141593, ..., 0.3527236 ,
0.37788018,
      0.30543099],
      [0.74324324, 0.72268908, 0.13274336, ..., 0.35642233,
0.34298881,
      0.29347285],
      [0.85810811, 0.84033613, 0.17256637, ..., 0.63517149,
0.49506254,
      0.49177877]])

```

#train and test

```

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)

from sklearn.linear_model import LogisticRegression

model = LogisticRegression()

model.fit(x_train,y_train)

/usr/local/lib/python3.7/dist-packages/sklearn/linear_model/_logistic.py:818: ConvergenceWarning: lbfgs failed to converge
(status=1):
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.

```

Increase the number of iterations (max_iter) or scale the data as

shown in:

<https://scikit-learn.org/stable/modules/preprocessing.html>

Please also refer to the documentation for alternative solver options:

https://scikit-learn.org/stable/modules/linear_model.html#logistic-regression

```
extra_warning_msg=_LOGISTIC_SOLVER_CONVERGENCE_MSG,
```

```
LogisticRegression()
```

```
# test with train data
```

```
pred = model.predict(x_train)
```

```
pred
```

```
array([ 6,  8, 10, ...,  9,  8,  8])
```

```
from sklearn import metrics
```

```
metrics.accuracy_score(pred,y_train)
```

```
0.26967973660580663
```

```
pred = model.predict(x_test)
```

```
metrics.accuracy_score(pred,y_test)
```

```
0.25239234449760767
```