ASSIGNMENT 4

Assignment Date	25 Nov 2022
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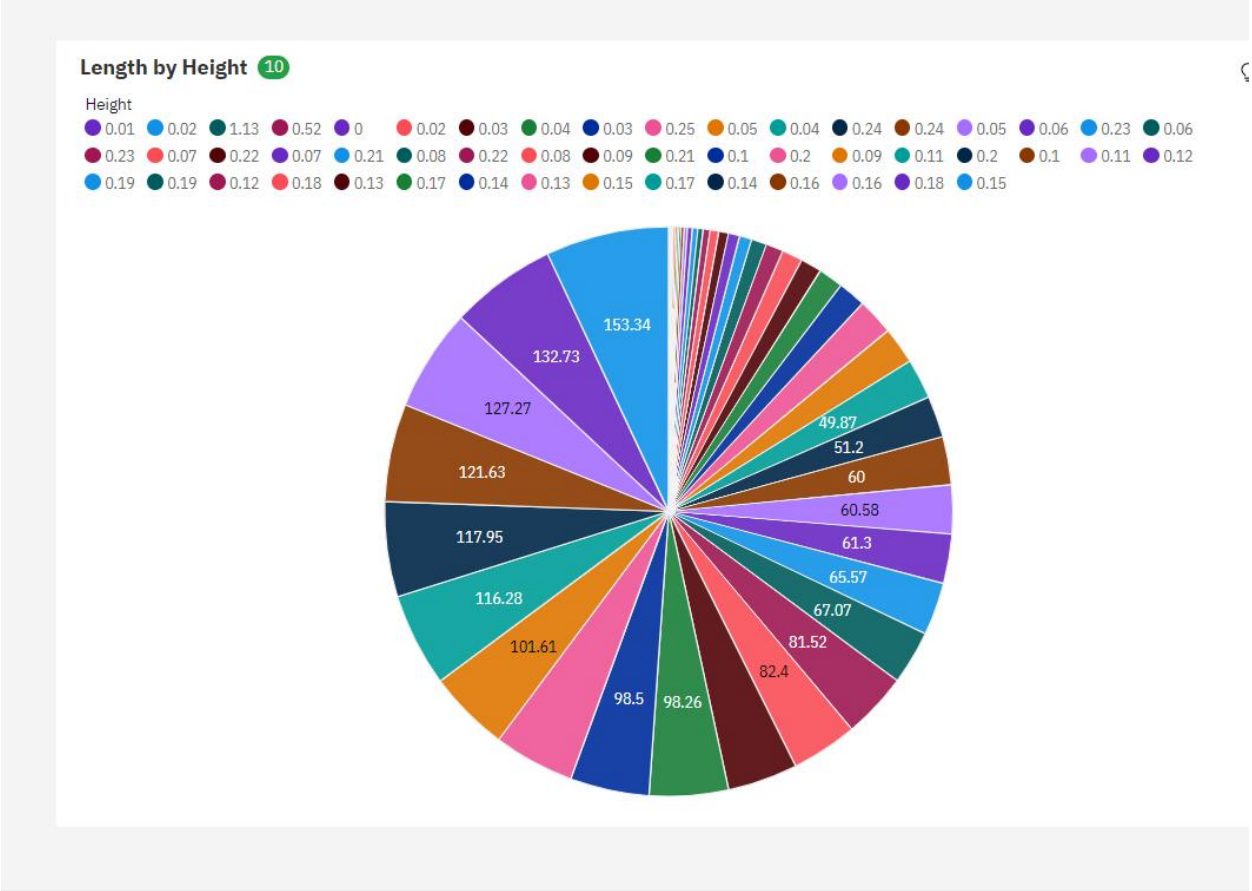
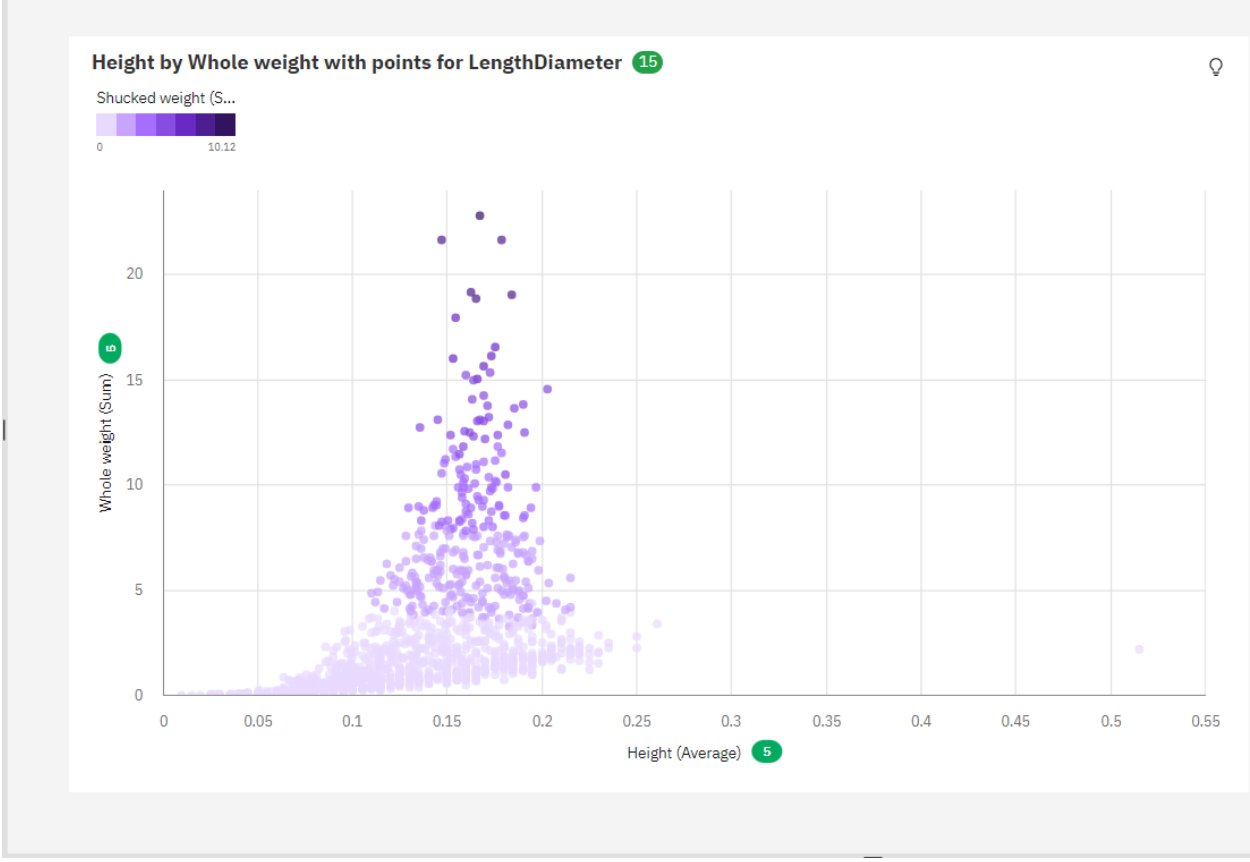
Student Roll Number	420619104008
Maximum Mark	2 mark

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

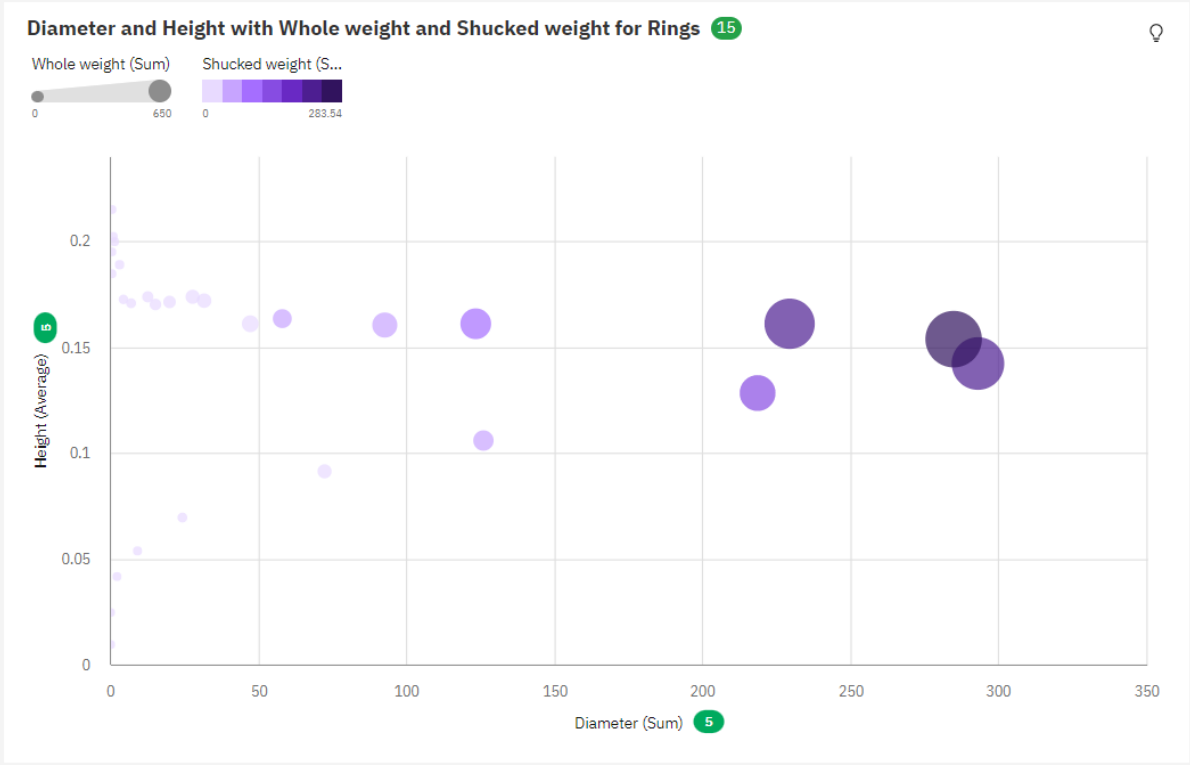
Univariate Analysis



Bi variate Analysis



Multi Variate Analysis


Diameter and Height with Whole weight and Shucked weight for Rings
15
Whole weight (Sum)
0
650
Shucked weight (S...
0
283.54
0.2
0.15
0.1
0.05
0
Height (Average)
5
0
50
100
150
200
250
300
350
Diameter (Sum)
5

```
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	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

```
data.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

```
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
```

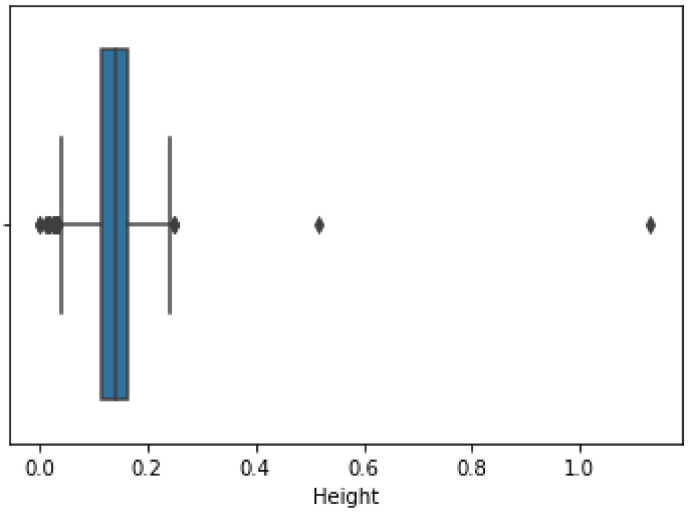
```
# remove unwanted columns
data = data.drop(columns = ['Sex'],axis = 1)
```

```
data.head()
```

	Length	Diameter	Height	Whole weight	Shucked weight	Viscera weight	Shell weight	Rings
0	0.455	0.365	0.095	0.5140	0.2245	0.1010	0.150	15
1	0.350	0.265	0.090	0.2255	0.0995	0.0485	0.070	7
2	0.530	0.420	0.135	0.6770	0.2565	0.1415	0.210	9
3	0.440	0.365	0.125	0.5160	0.2155	0.1140	0.155	10
4	0.330	0.255	0.080	0.2050	0.0895	0.0395	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: Pas
  FutureWarning
<matplotlib.axes._subplots.AxesSubplot at 0x7f7f76a2a810>
```




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

	0.000	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	...	0.2
0	0	0	0	0	0	0	0	0	0	0	...	
1	0	0	0	0	0	0	0	0	0	0	...	
2	0	0	0	0	0	0	0	0	0	0	...	
3	0	0	0	0	0	0	0	0	0	0	...	
4	0	0	0	0	0	0	0	0	0	0	...	
...	...	...	...	...	...	...	...	...	...	...	...	...
4172	0	0	0	0	0	0	0	0	0	0	...	
4173	0	0	0	0	0	0	0	0	0	0	...	
4174	0	0	0	0	0	0	0	0	0	0	...	
4175	0	0	0	0	0	0	0	0	0	0	...	
4176	0	0	0	0	0	0	0	0	0	0	...	

4177 rows × 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: Conver
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
```

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