Data Collection and Preprocessing Phase Report

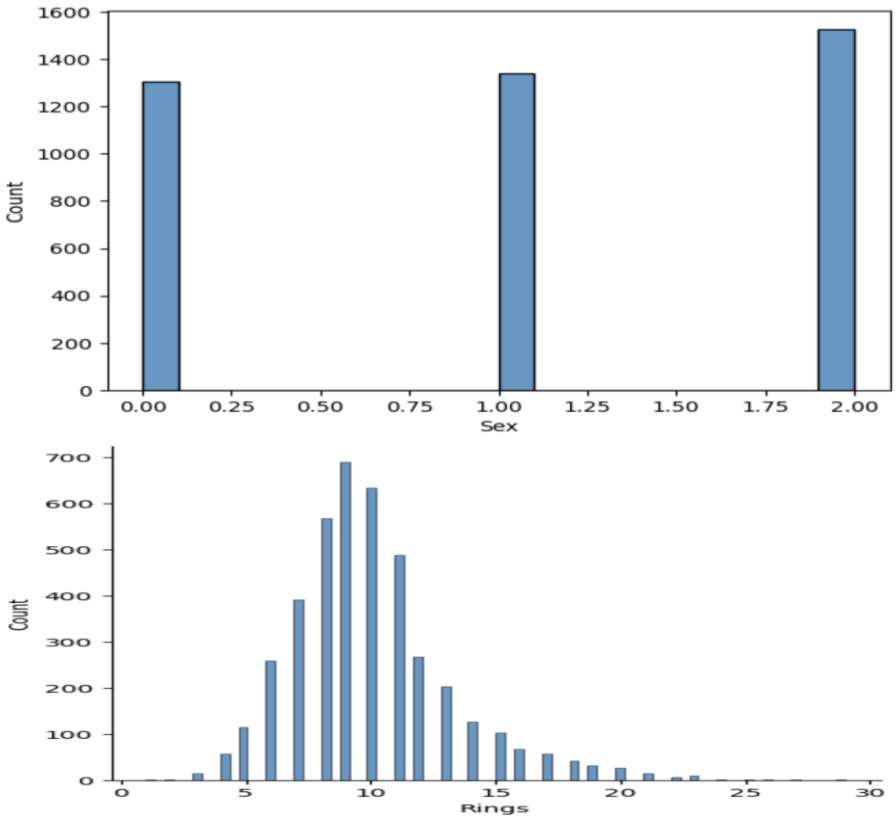
Date	7 July 2024
Team ID	6
Project Title	Abalone Age Prediction
Maximum Marks	6 Marks

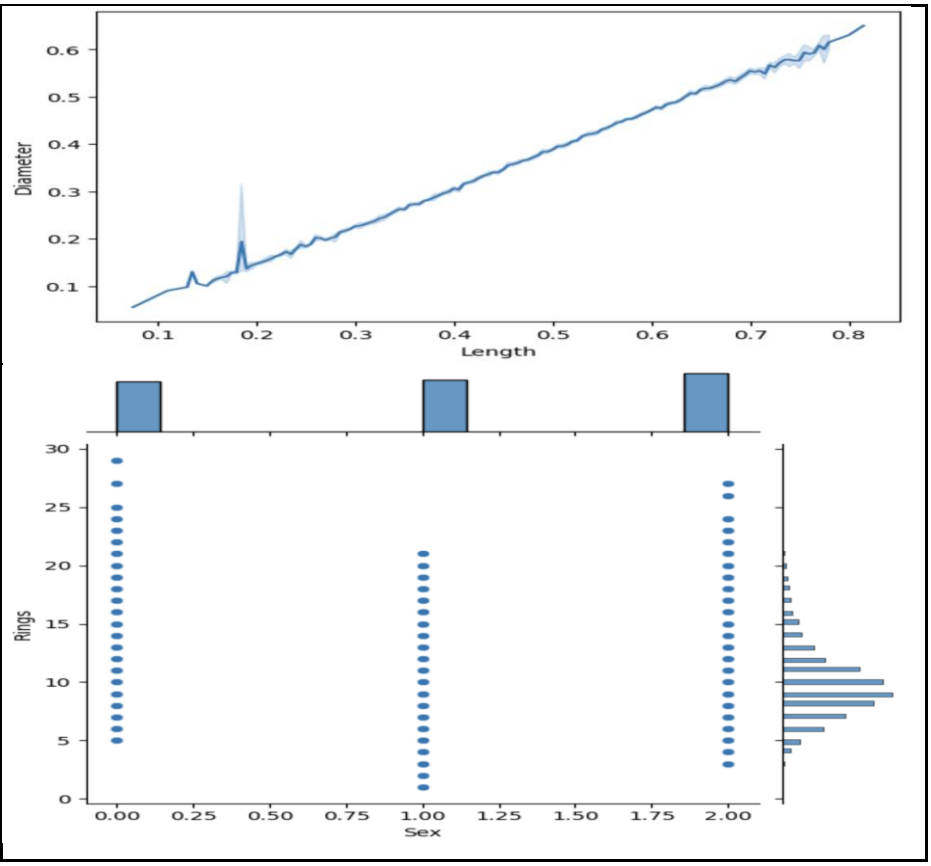
Data Exploration and Preprocessing Report (6 Marks):

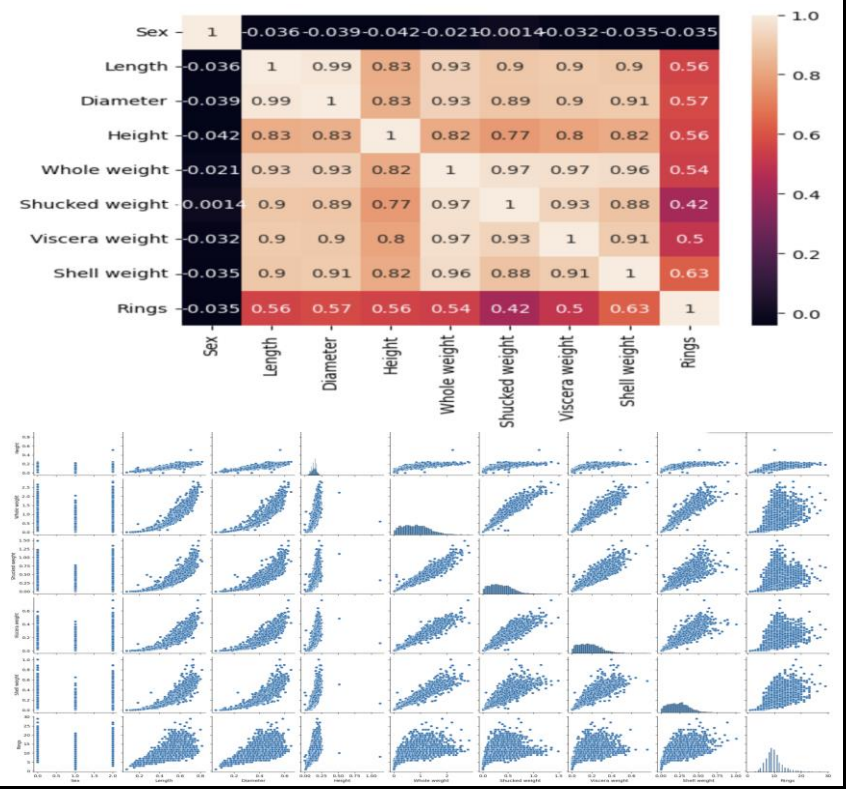
Dataset variables will be statistically analysed to identify patterns and outliers, with Python employed for preprocessing tasks like normalization and feature engineering. Data cleaning will address missing values and outliers, ensuring quality for subsequent analysis and modelling, and forming a strong foundation for insights and predictions.

Section	Description
Data Overview	

	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

Univariate Analysis (Hist plot, Dis plot)	

Bivariate Analysis (Line plot, Joint plot)	

Multivariate Analysis (Heatmap, Pair plot)	
Outliers and Anomalies	-
Data Preprocessing Code Screenshots	
Loading Data	

```
#importing the dataset which is in csv file
df=pd.read_csv('/content/abalone.csv')
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

Handling Missing Data	`df.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

Data Transformation	`from sklearn.preprocessing import StandardScaler`
	`sc=StandardScaler()`
	`x_train_scaled=sc.fit_transform(x_train)`
	`x_test_scaled=sc.fit_transform(x_test)`
	`x_train_scaled`
	array([[-1.26661948, -0.04375418, 0.16375944, ..., 0.16461909, 0.40936642, 0.58511393],
	[1.1549975 , 0.71476099, 0.77489631, ..., 0.78012036, 0.28950211, 0.01613635],
	[-1.26661948, 1.34685698, 1.23324896, ..., 1.72040642, 1.58495863, 0.96564034],
	...,
	[-0.05581099, -0.46515151, -0.39644936, ..., -0.49857784, -0.60487 , -0.55284124],
	[-1.26661948, -0.12803365, -0.34552129, ..., -0.3327786 , -0.57720901, -0.66156307],
	[1.1549975 , -0.21231311, -0.34552129, ..., -0.38955916, -0.13463312, -0.65793901]])
	`x_test_scaled`
	array([[-1.33946926e+00, -4.71700742e-01, -2.29814532e-01, ..., -2.52459826e-01, -2.46013428e-01, -5.35361844e-01],
	[-1.33946926e+00, 5.64153706e-01, 4.48387505e-01, ..., 8.75136245e-04, -2.15328603e-01, 5.41461461e-01],
	[-1.33946926e+00, -9.49787410e-01, -6.65801555e-01, ..., -6.43381881e-01, -5.26560391e-01, -8.13251729e-01],
	...,
	[-1.33946926e+00, -1.18883074e+00, -1.24711759e+00, ..., -1.10855729e+00, -1.11395560e+00, -1.16061409e+00],
	[-1.33946926e+00, 1.12192149e+00, 1.27191855e+00, ..., 1.54272413e+00, 1.15672139e+00, 1.23618617e+00],
	[-1.33946926e+00, 1.24144315e+00, 1.22347555e+00, ..., 1.39640135e+00, 1.31014551e+00, 1.05555775e+00]])

Feature Engineering	Attached codes in final submission.
Save Processed Data	-