Assignment 3

Ai and ml

Name: **Jasti Pavan**

Registration Number: **21BDS0309**

1. Penguine_size.csv is downloaded
1. Load the dataset into the tool.

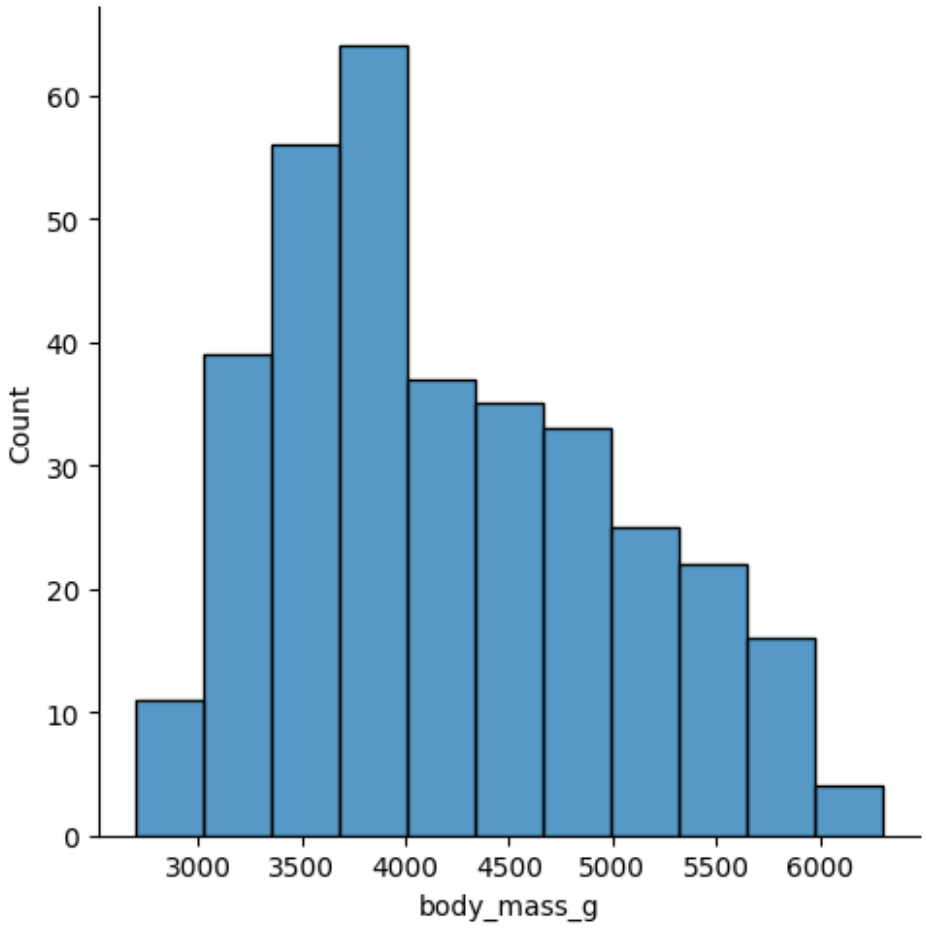
```
import numpy as np
import pandas as pd

df=pd.read_csv('/content/penguins_size.csv')
df.head()
```

```
  species     island  culmen_length_mm  culmen_depth_mm
flipper_length_mm  \
0  Adelie  Torgersen              39.1             18.7
181.0
1  Adelie  Torgersen              39.5             17.4
186.0
2  Adelie  Torgersen              40.3             18.0
195.0
3  Adelie  Torgersen               NaN              NaN
NaN
4  Adelie  Torgersen              36.7             19.3
193.0

   body_mass_g     sex
0       3750.0    MALE
1       3800.0  FEMALE
2       3250.0  FEMALE
3          NaN     NaN
4       3450.0  FEMALE
```

3.1. Perform Univariates Analysis

```
from matplotlib import rcParams
import seaborn as sns
sns.displot(df.body_mass_g)
```

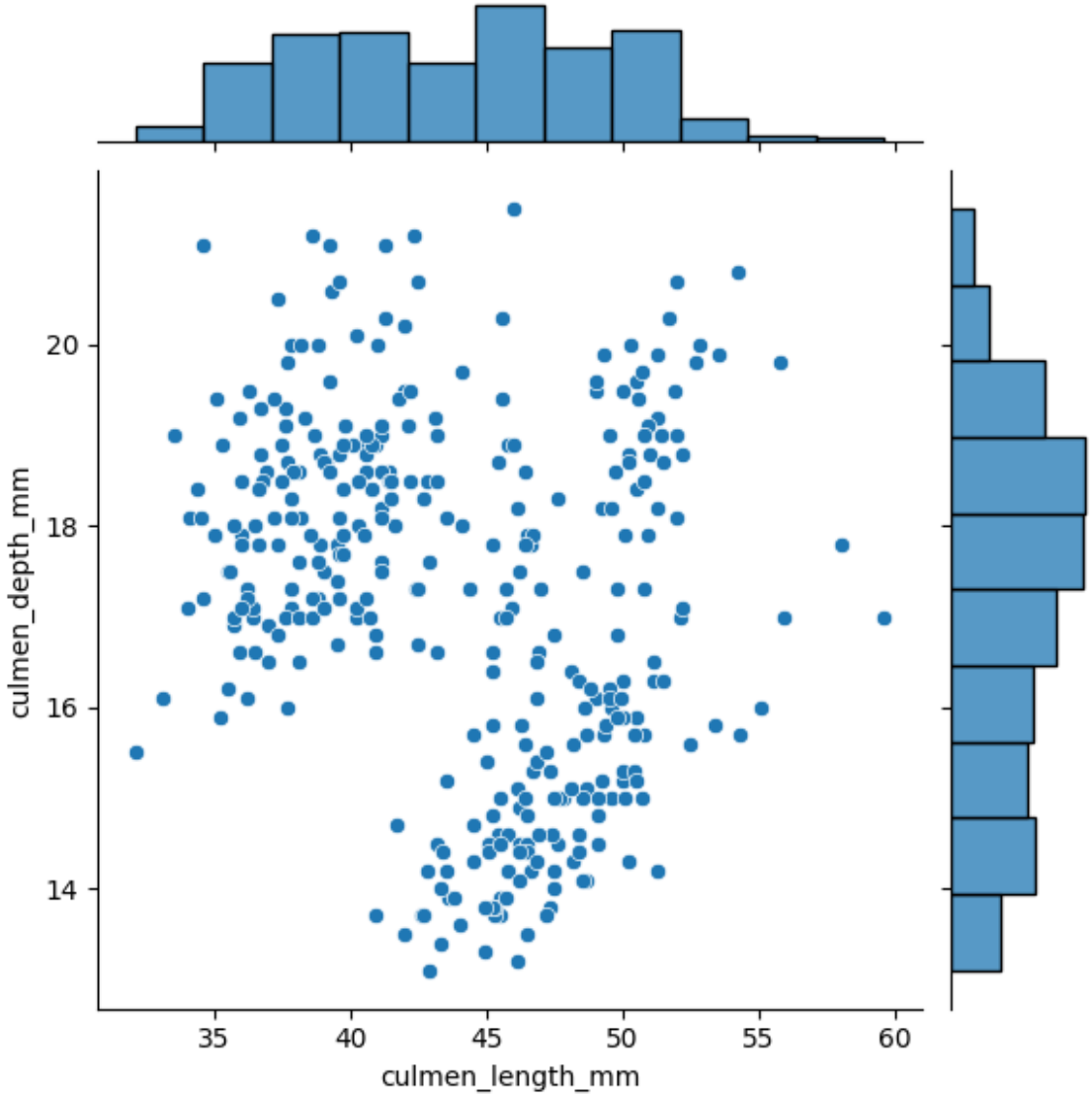
```
<seaborn.axisgrid.FacetGrid at 0x7dd35d76c910>
```



3.2. Perform Bivariates Analysis

```
sns.jointplot(x='culmen_length_mm',y='culmen_depth_mm',data=df)
```

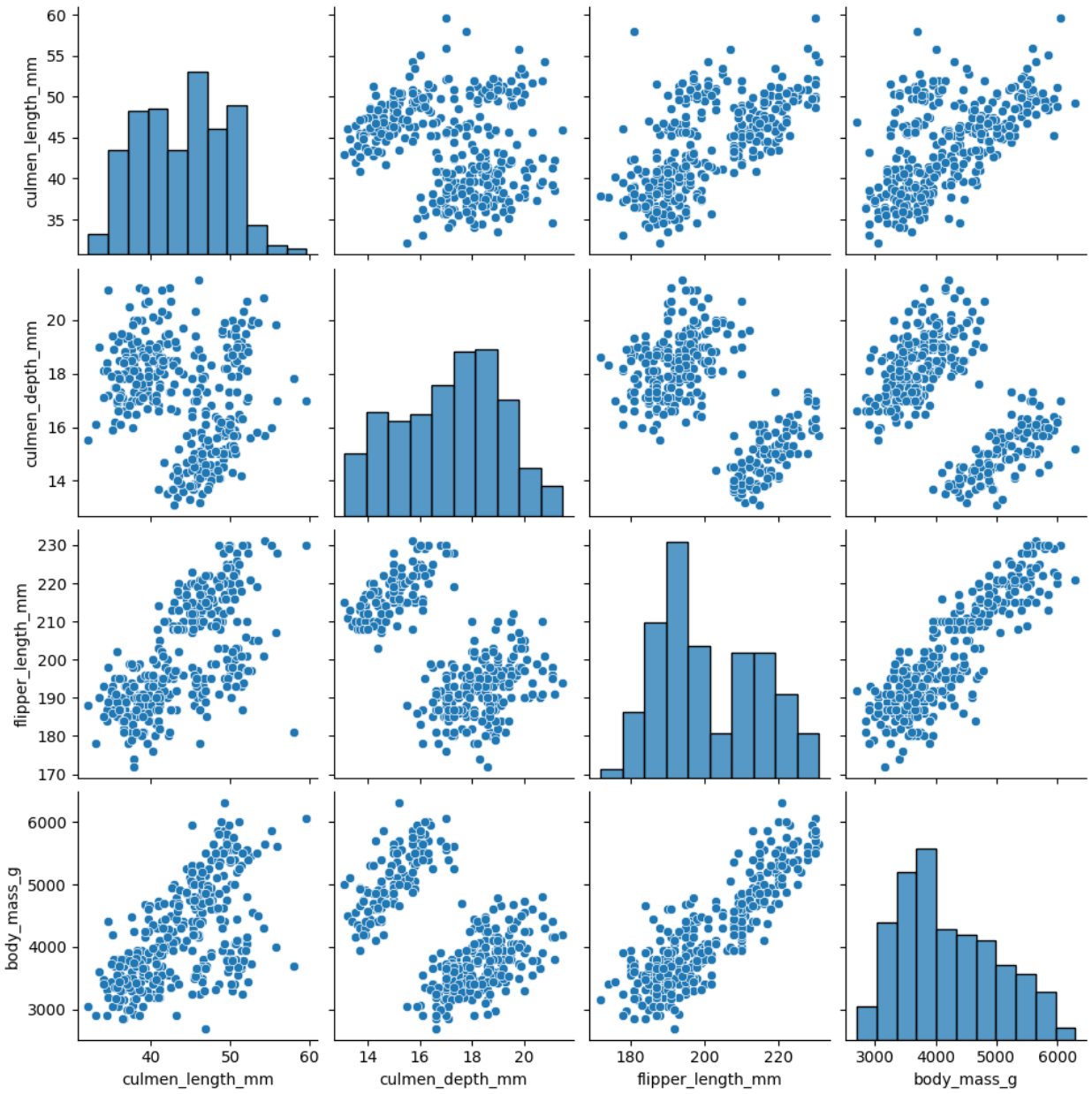
```
<seaborn.axisgrid.JointGrid at 0x7dd35d76c5e0>
```



3.3. Perform Multi-Variate Analysis

```
sns.pairplot(df)
```

```
<seaborn.axisgrid.PairGrid at 0x7dd35b1b8a60>
```



1. Perform descriptive statistics on the dataset.

```
df.describe()
```

	culmen_length_mm	culmen_depth_mm	flipper_length_mm	body_mass_g
count	342.000000	342.000000	342.000000	342.000000
mean	43.921930	17.151170	200.915205	4201.754386
std	5.459584	1.974793	14.061714	801.954536
min	32.100000	13.100000	172.000000	

```
2700.000000
25%           39.225000        15.600000         190.000000
3550.000000
50%           44.450000        17.300000         197.000000
4050.000000
75%           48.500000        18.700000         213.000000
4750.000000
max           59.600000        21.500000         231.000000
6300.000000
```

1. Check for Missing values and deal with them.

```
df.isnull().any() #Checking if there any null values in the dataset
```

```
species               False
island                False
culmen_length_mm       True
culmen_depth_mm        True
flipper_length_mm      True
body_mass_g            True
sex                    True
dtype: bool
```

```
df.isnull().sum()
```

```
species                0
island                 0
culmen_length_mm       2
culmen_depth_mm        2
flipper_length_mm      2
body_mass_g            2
sex                   10
dtype: int64
```

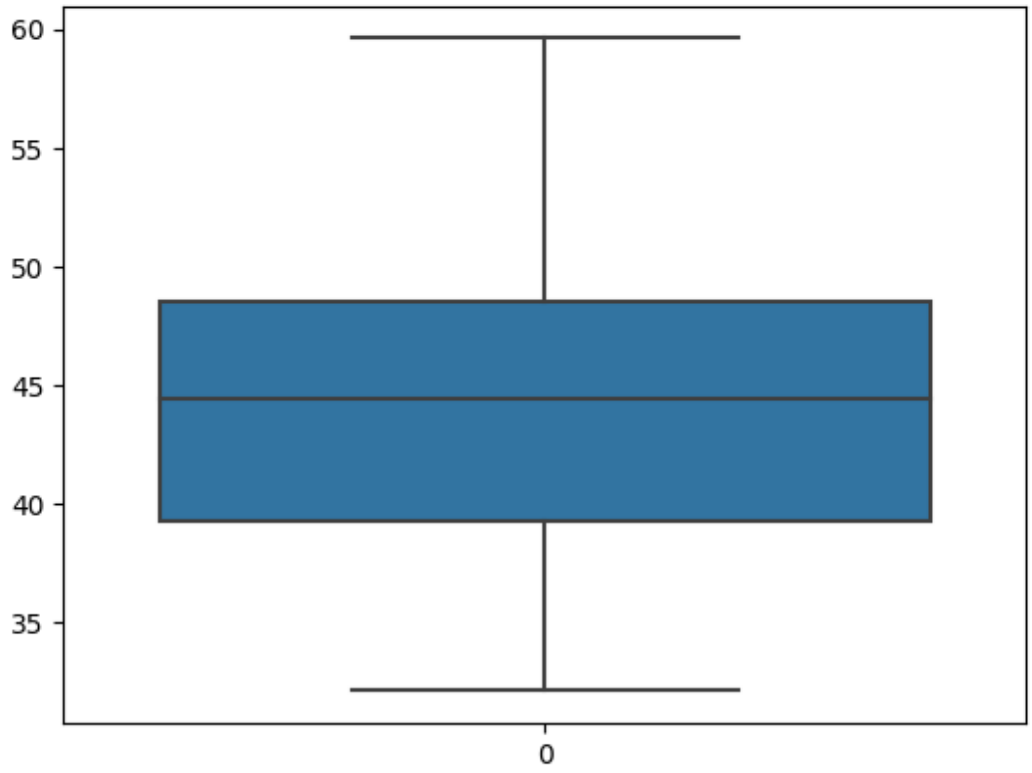
```
# Code to replace null values in numerical columns with MEDIAN
df['culmen_length_mm'].fillna(df['culmen_length_mm'].median(),inplace=
True)
df['culmen_depth_mm'].fillna(df['culmen_depth_mm'].median(),inplace=Tr
ue)
df['flipper_length_mm'].fillna(df['flipper_length_mm'].median(),inplac
e=True)
df['body_mass_g'].fillna(df['body_mass_g'].median(),inplace=True)

# Code to replace null values in categorical column with MODE
df['sex'].fillna(df['sex'].mode().iloc[0],inplace=True)

# Now all null values are replaced with median and mode and dealt
properly.
df.isnull().any()
```

```
species              False
island               False
culmen_length_mm     False
culmen_depth_mm      False
flipper_length_mm    False
body_mass_g          False
sex                  False
dtype: bool
```

1. Find the outliers and replace the outliers

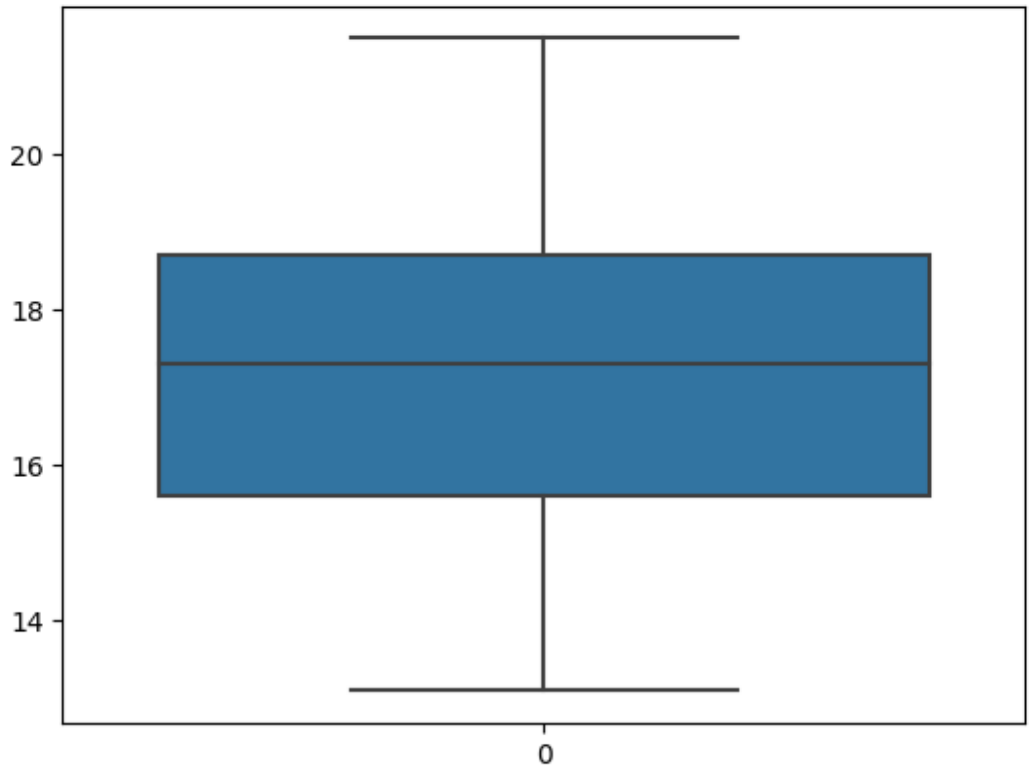
```
sns.boxplot(df.culmen_length_mm)
```

```
<Axes: >
```



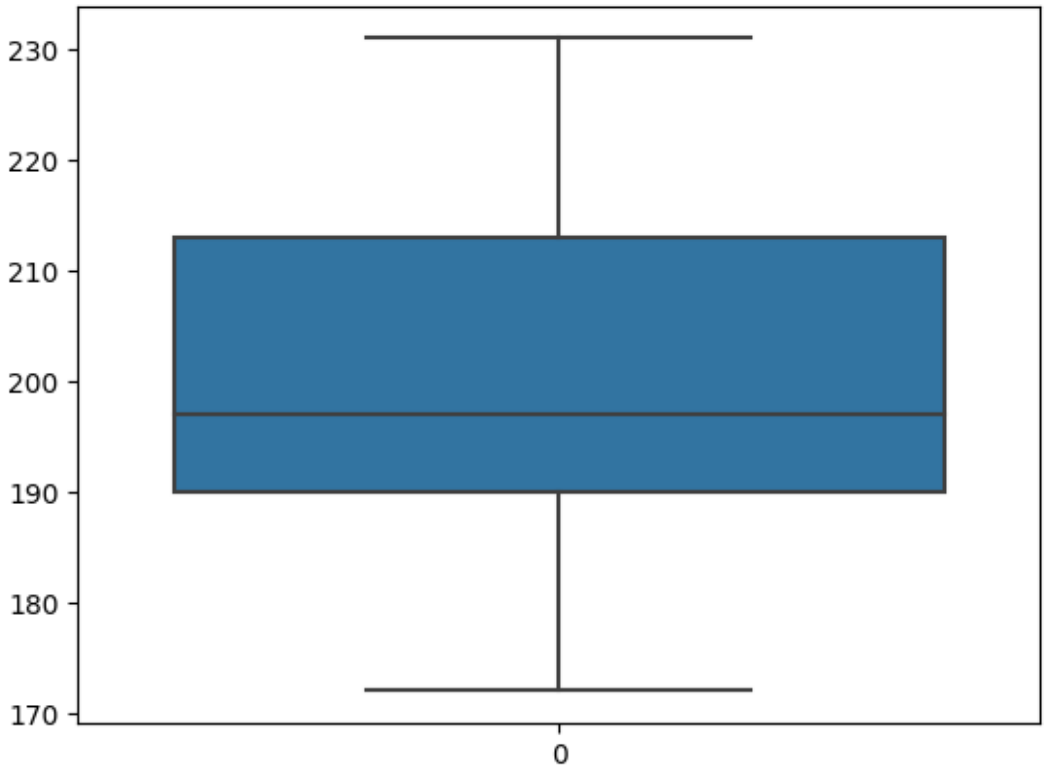

```
sns.boxplot(df.culmen_depth_mm)
```

```
<Axes: >
```



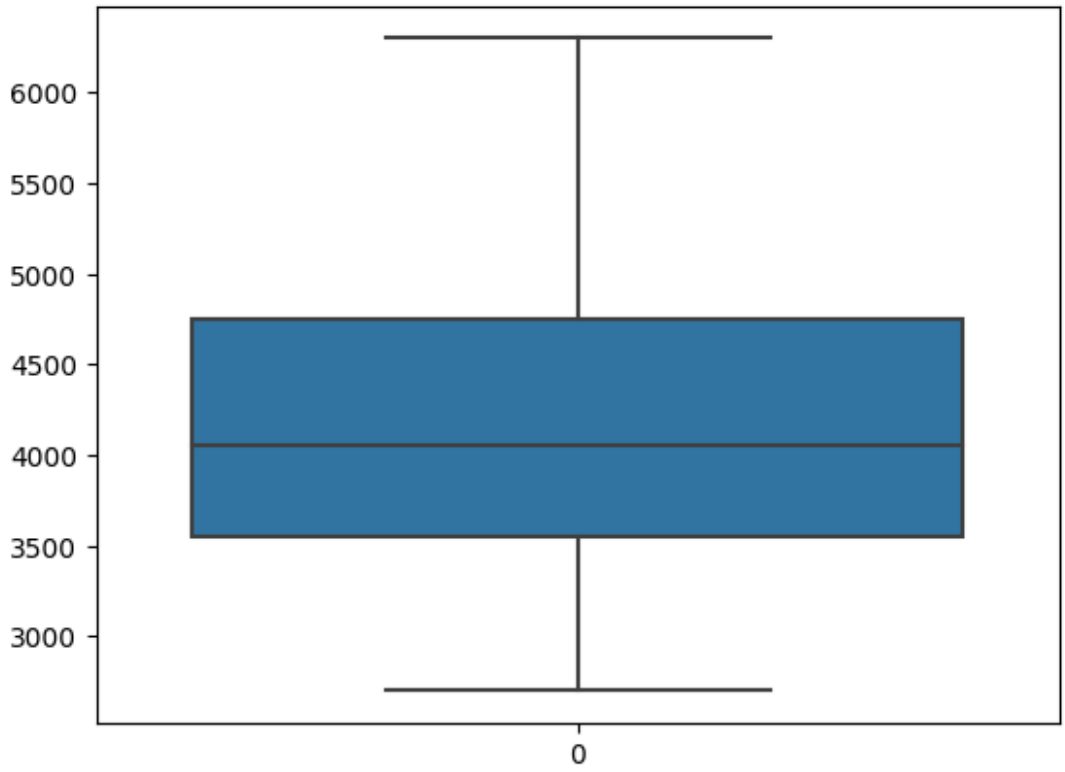

```
sns.boxplot(df.flipper_length_mm)
```

```
<Axes: >
```




```
sns.boxplot(df.body_mass_g)
```

```
<Axes: >
```



Hence there are no outliers in the dataset.

1. Check for Categorical columns and perform encoding.

```
from sklearn.preprocessing import LabelEncoder
le = LabelEncoder()
df['sex'] = le.fit_transform(df['sex'])
df['species'] = le.fit_transform(df['species'])
df['island'] = le.fit_transform(df['island'])
df.head()
```

```
   species  island  culmen_length_mm  culmen_depth_mm
flipper_length_mm  \
0        0       2              39.10             18.7
181.0
1        0       2              39.50             17.4
186.0
2        0       2              40.30             18.0
195.0
3        0       2              44.45             17.3
197.0
4        0       2              36.70             19.3
193.0

   body_mass_g  sex
0       3750.0    2
1       3800.0    1
```

```
2       3250.0    1
3       4050.0    2
4       3450.0    1
```

1. Check the correlation of independent variables with the target (TARGET IS SPECIES and remaining are independent)

```
df.corr().species.sort_values(ascending=False)
```

```
species              1.000000
flipper_length_mm    0.850819
body_mass_g          0.747547
culmen_length_mm     0.728706
sex                 -0.003823
island              -0.635659
culmen_depth_mm     -0.741282
Name: species, dtype: float64
```

1. Split the data into dependent and independent variables

```
X=df.drop(columns=['species'],axis=1)
X.head()
```

```
   island  culmen_length_mm  culmen_depth_mm  flipper_length_mm
body_mass_g  \
0       2              39.10             18.7                181.0
3750.0
1       2              39.50             17.4                186.0
3800.0
2       2              40.30             18.0                195.0
3250.0
3       2              44.45             17.3                197.0
4050.0
4       2              36.70             19.3                193.0
3450.0

   sex
0    2
1    1
2    1
3    2
4    1
```

```
Y=df['species']
Y.head()
```

```
0    0
1    0
2    0
3    0
```

```
4    0
Name: species, dtype: int64
```

1. Scaling the independent data

```
from sklearn.preprocessing import MinMaxScaler
scale = MinMaxScaler()
X_scaled = pd.DataFrame(scale.fit_transform(X),columns=X.columns)
X_scaled.head()
```

```
   island  culmen_length_mm  culmen_depth_mm  flipper_length_mm
body_mass_g  \
0     1.0          0.254545         0.666667           0.152542
0.291667
1     1.0          0.269091         0.511905           0.237288
0.305556
2     1.0          0.298182         0.583333           0.389831
0.152778
3     1.0          0.449091         0.500000           0.423729
0.375000
4     1.0          0.167273         0.738095           0.355932
0.208333

   sex
0  1.0
1  0.5
2  0.5
3  1.0
4  0.5
```

1. Split the 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_scaled,Y,test_size=0.2,random_state=0)
```

1. Check the training and testing data shape.

```
X_train.shape

(275, 6)

X_test.shape

(69, 6)

Y_train.shape

(275,)

Y_test.shape
```

```
(69,)
```

---------- ***DONE*** ----------

```

```