ASSIGNMENT – 3

Artificial Intelligence & Machine Learning in collaboration with Google (Applied Data Science)

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Answers

1. Download the dataset: Dataset
2. Load the dataset into the tool.

Penguin Classification Analysis

```
import pandas as pd
import matplotlib.pyplot as plt
from matplotlib import rcParams
import seaborn as sns
df = pd.read_csv('/content/penguins_size.csv')
df.head()
```

	species	island	culmen_length_mm	culmen_depth_mm	flipper_length_mm	body_mass_g	sex
0	Adelie	Torgersen	39.1	18.7	181.0	3750.0	MALE
1	Adelie	Torgersen	39.5	17.4	186.0	3800.0	FEMALE
2	Adelie	Torgersen	40.3	18.0	195.0	3250.0	FEMALE
3	Adelie	Torgersen	NaN	NaN	NaN	NaN	NaN
4	Adelie	Torgersen	36.7	19.3	193.0	3450.0	FEMALE

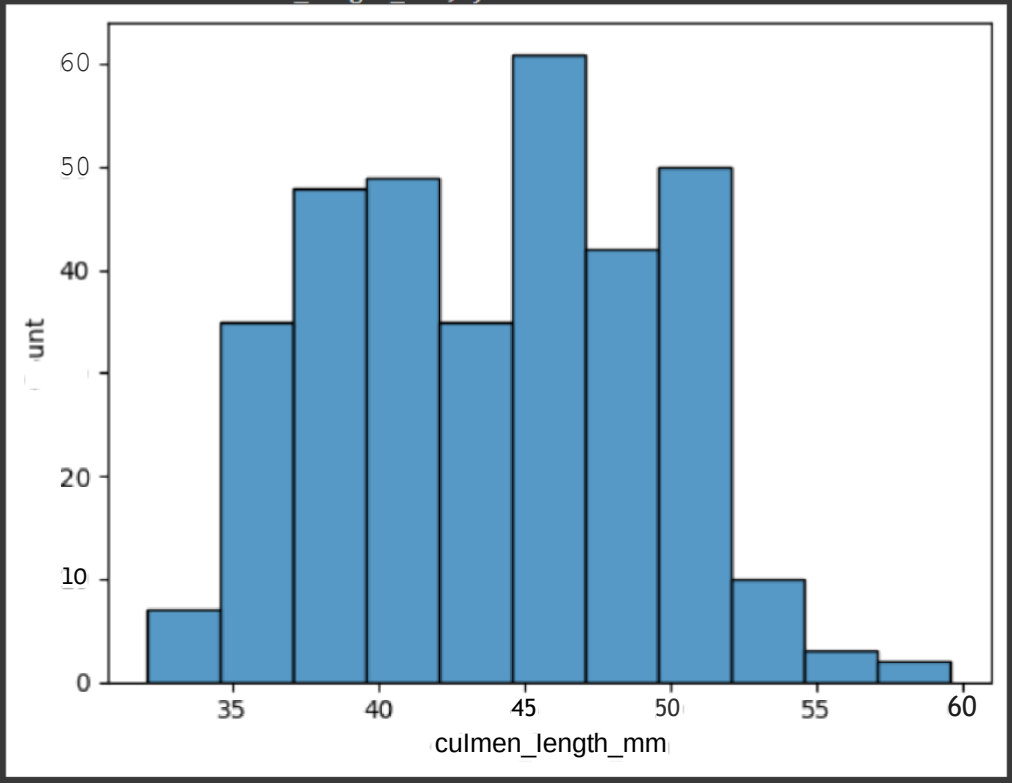
3. Perform Below Visualizations.

- Univariate Analysis

Univariate Analysis

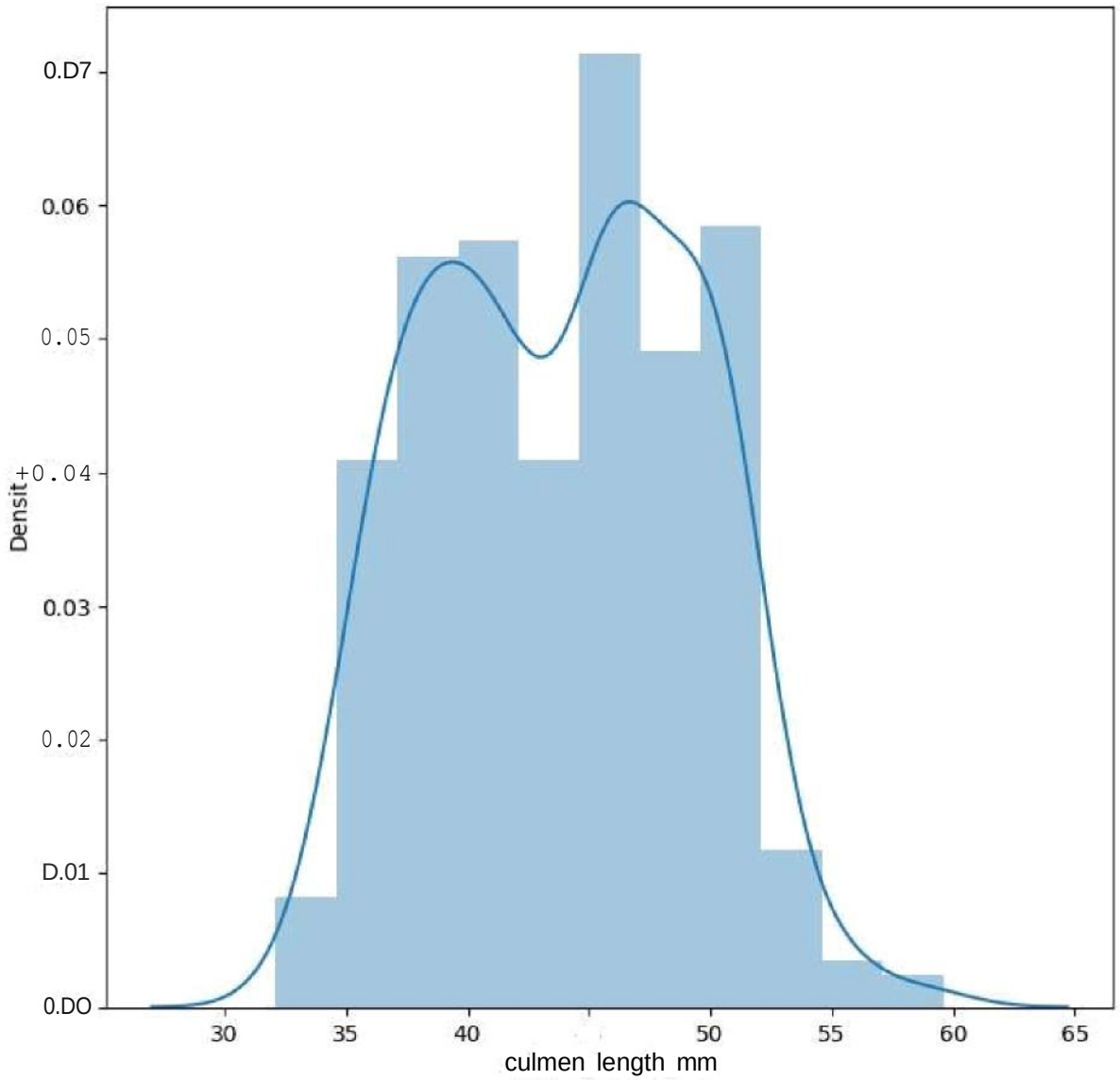
```
sns.histplot(df['culmen_length_mm'])
```

```
<Axes: xlabel='culmen_length_mm', ylabel='Count'>
```



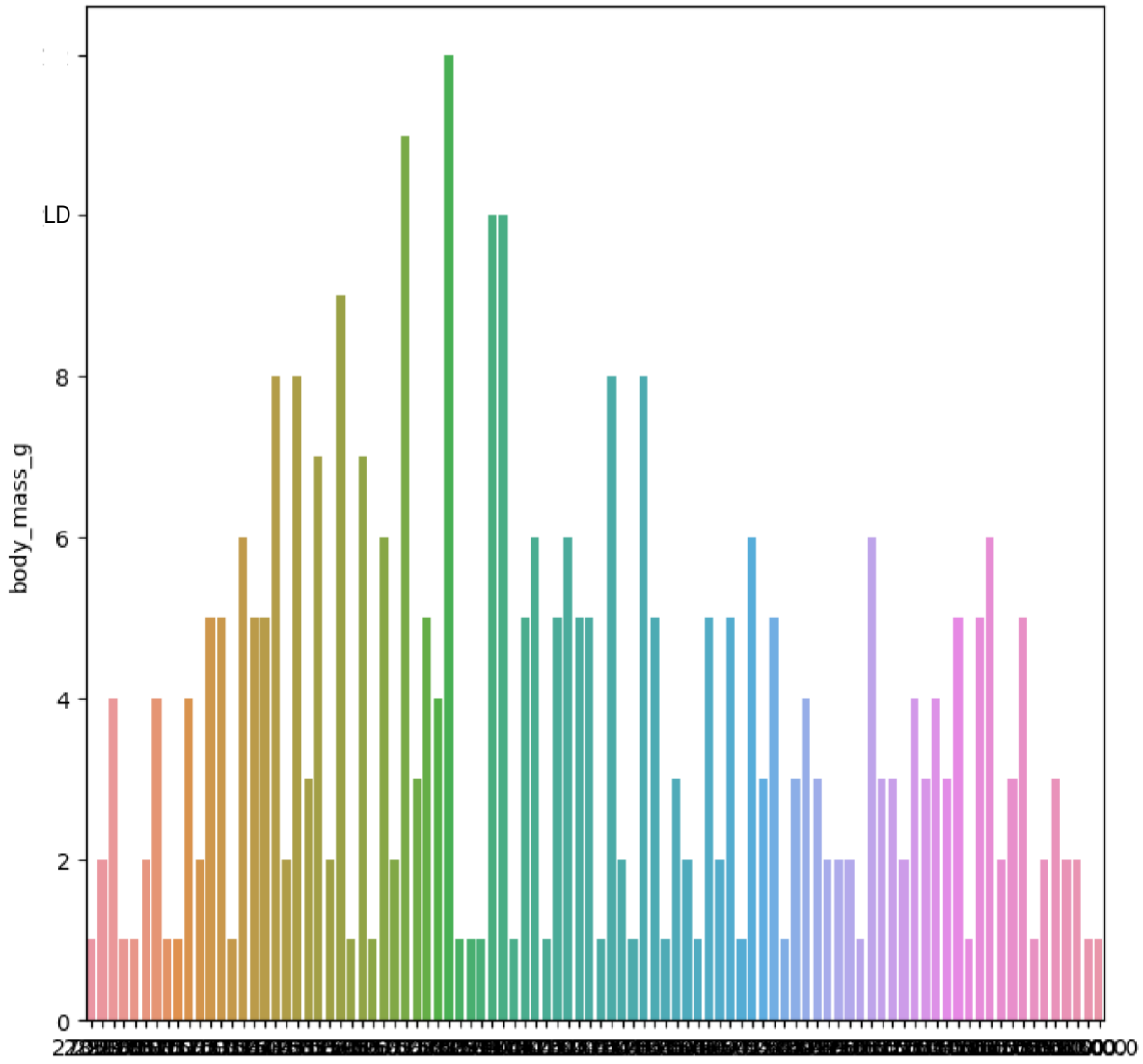
```
sns.distplot(df.culmen_length_mm)
```

```
<ipython-input-15-24e9b5890c61>:1: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751

  sns.distplot(df.culmen_length_mm)
<Axes: xlabel='culmen_length_mm', ylabel='Density'>
```



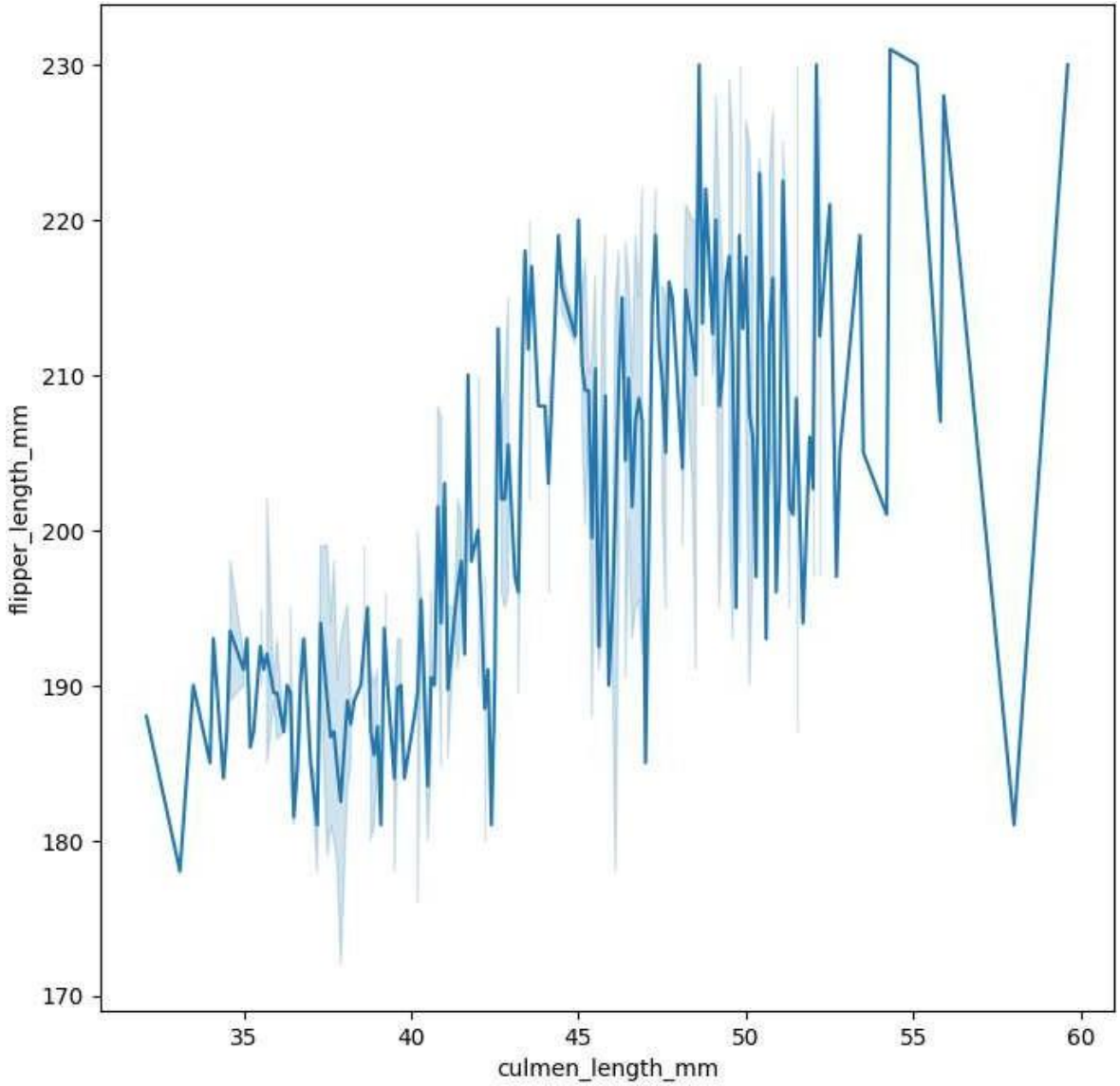
```
sns.barplot(x =df.body_mass_g.value_counts().index,y =df.body_mass_g.value_counts() )
```

```
<Axes: ylabel='body_mass_g'>
```



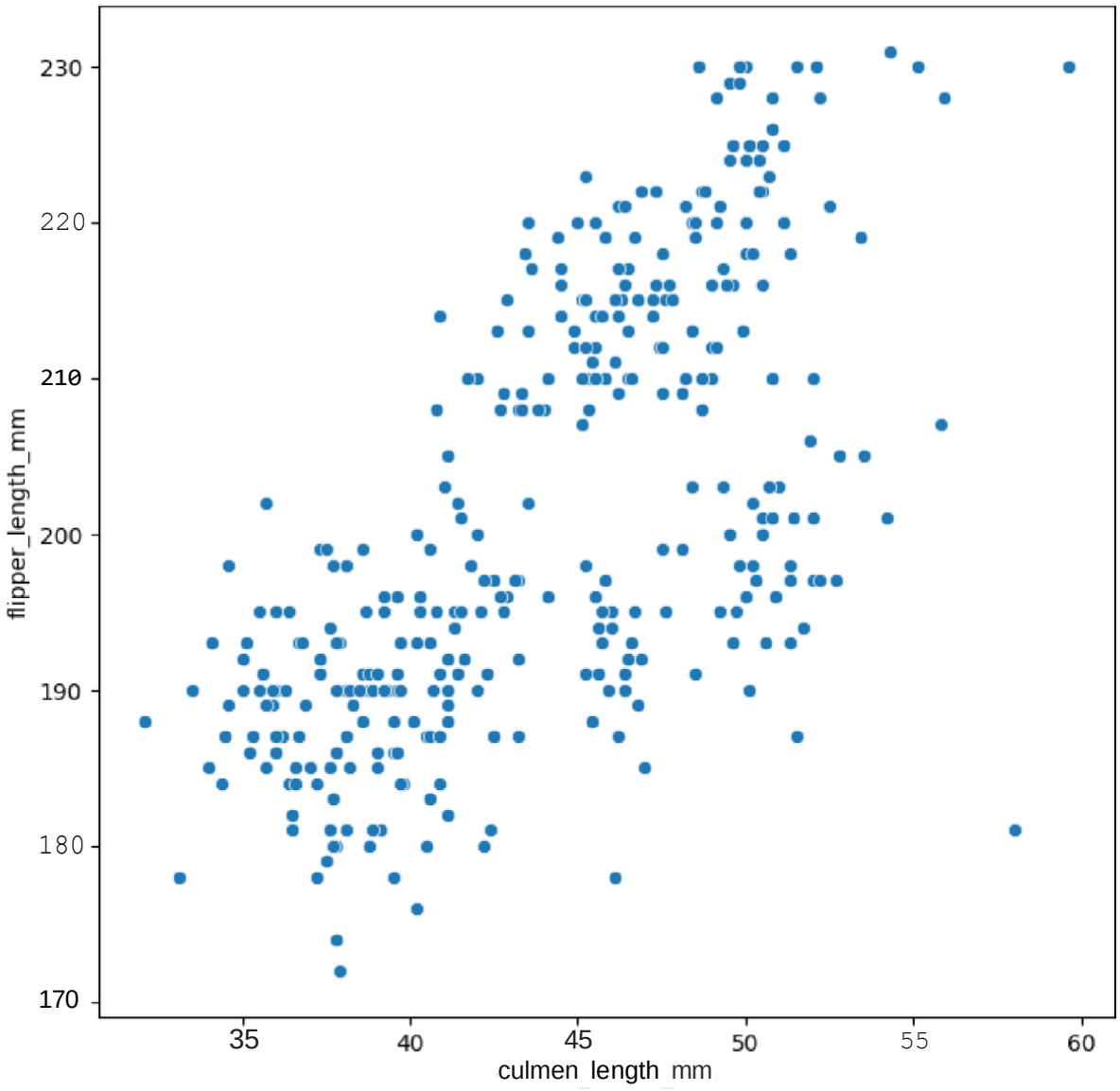
- Bi- Variate Analysis

```
sns.lineplot(x = df.culmen_length_mm,y=df.flipper_length_mm)
```



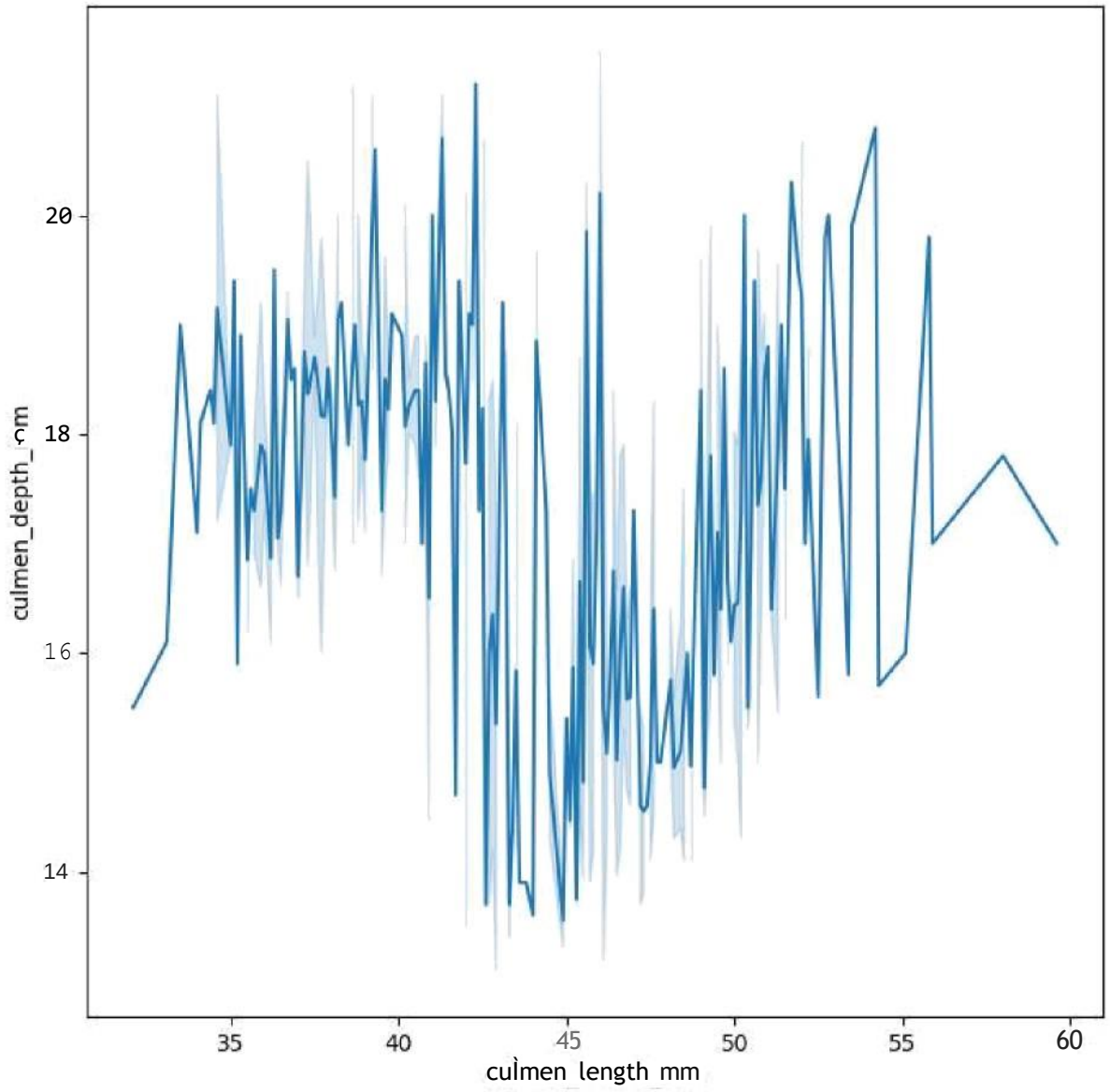
```
sns.scatterplot(x = df.culmen_length_mm,y=df.flipper_length_mm)
```

```
<Axes: xlabel='culmen_length_mm', ylabel='flipper_length_mm'>
```

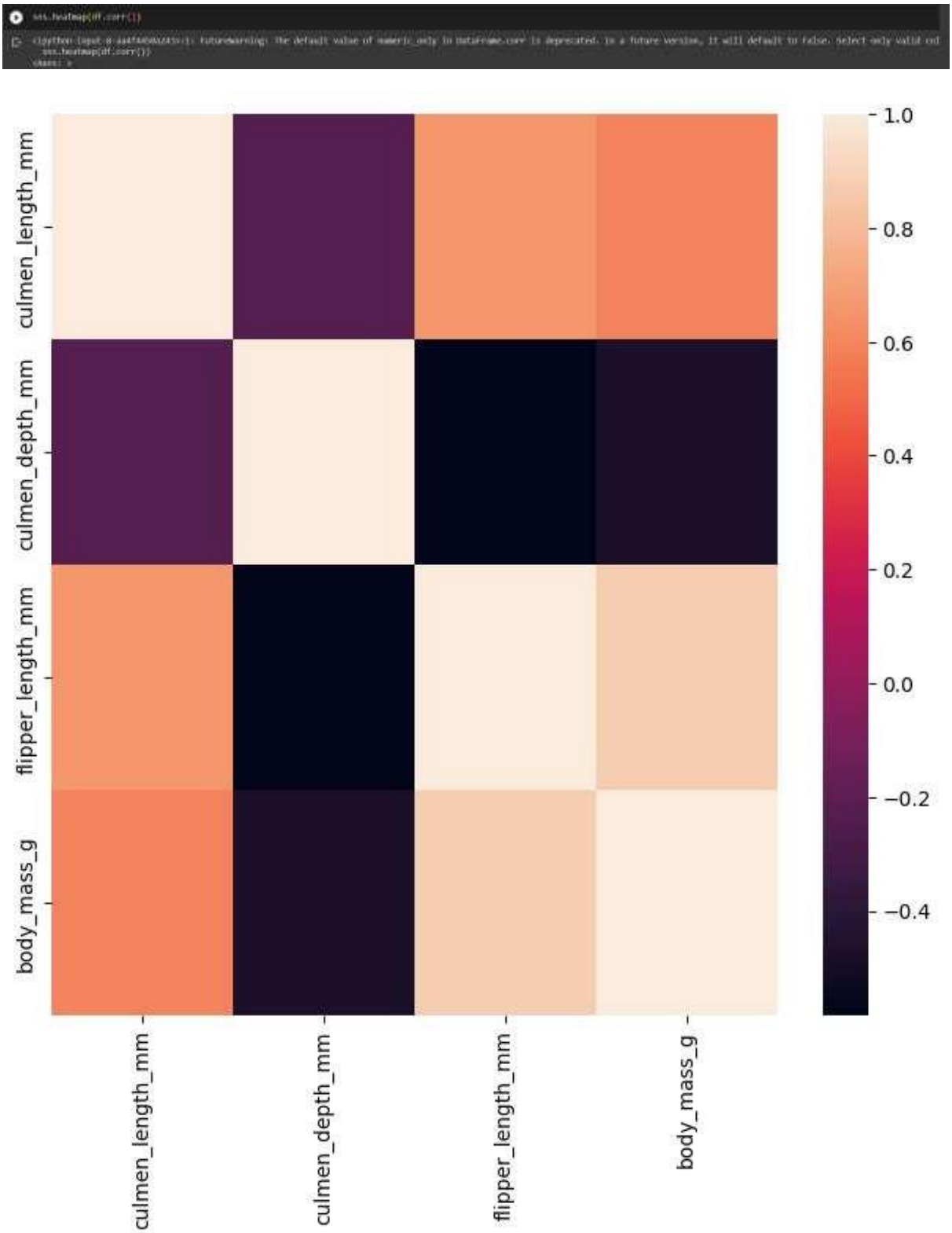


```
sns.lineplot(x = df.culmen_length_mm,y=df.culmen_depth_mm)
```

```
<Axes: xlabel='culmen_length_mm', ylabel='culmen_depth_mm'>
```

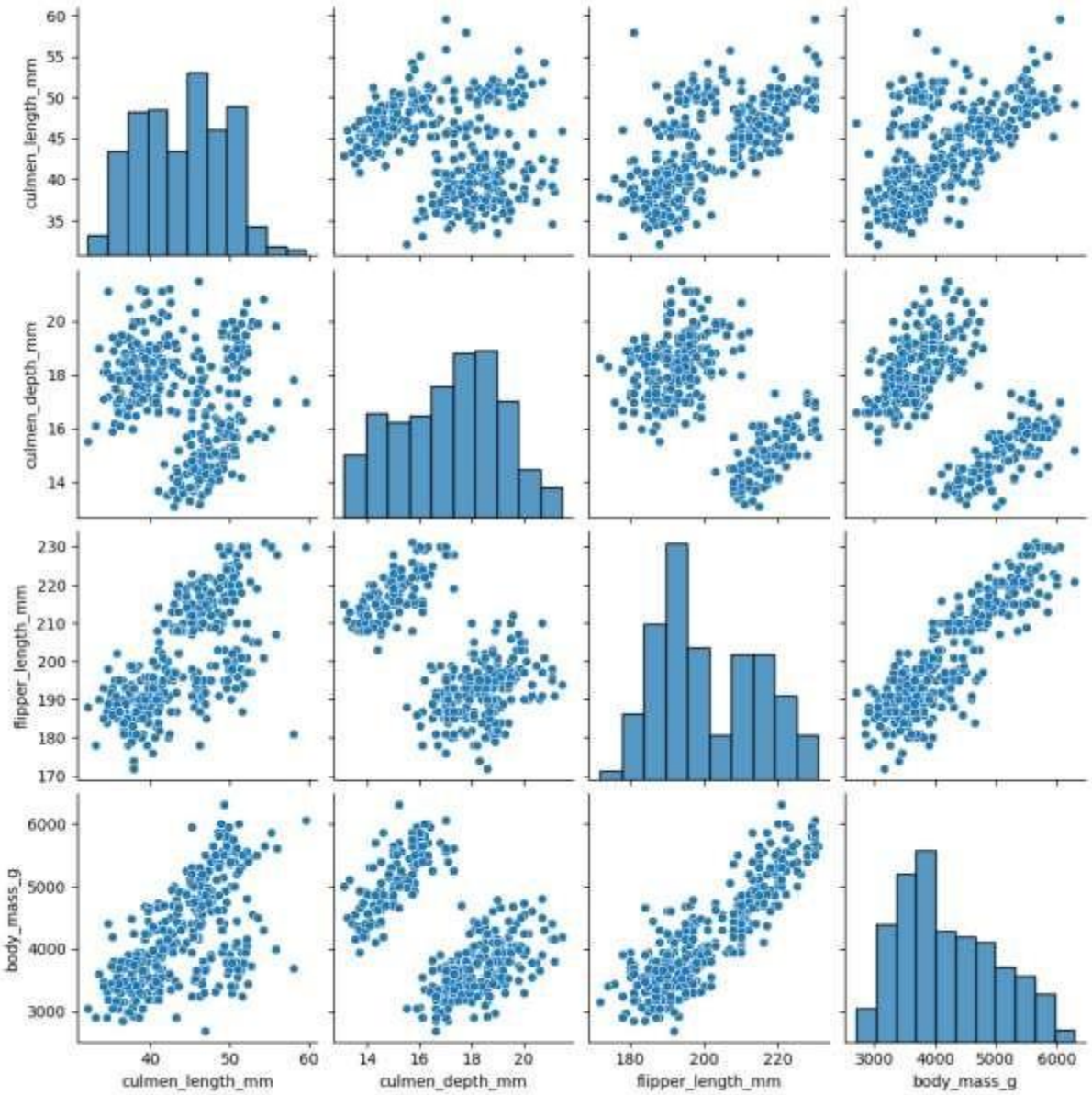


- Multi-Variate Analysis



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

```
<seaborn.axisgrid.PairGrid at 0x7c2f895ebb20>
```



4. Perform descriptive statistics on the dataset

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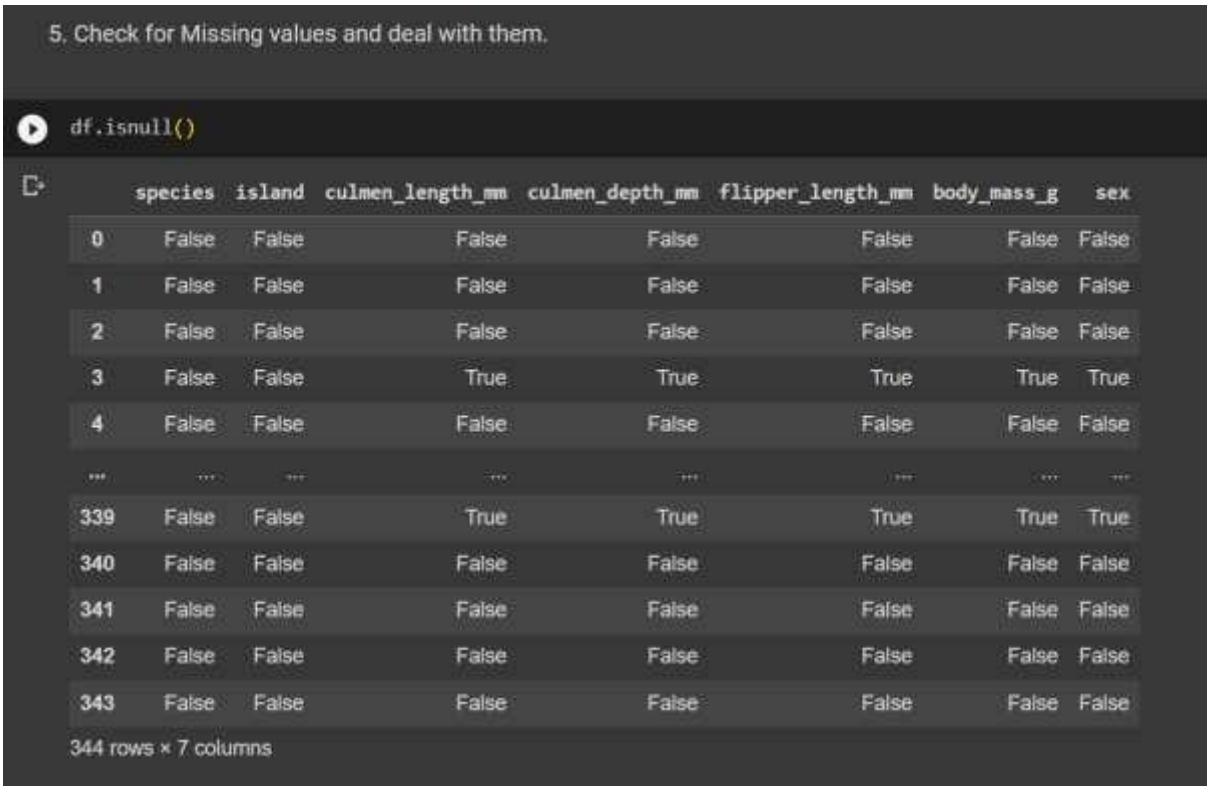
```
stats = df.describe(include = 'all')
print(stats)
```

```
        species  island  culmen_length_mm  culmen_depth_mm  flipper_length_mm  \
count       344     344         342.000000       342.000000         342.000000
unique        3       3                NaN              NaN                NaN
top     Adelie  Biscoe                NaN              NaN                NaN
freq        152     168                NaN              NaN                NaN
mean        NaN     NaN          43.921930        17.151170         200.915205
std         NaN     NaN           5.459584         1.974793          14.061714
min         NaN     NaN          32.100000        13.100000         172.000000
25%         NaN     NaN          39.225000        15.600000         190.000000
50%         NaN     NaN          44.450000        17.300000         197.000000
75%         NaN     NaN          48.500000        18.700000         213.000000
max         NaN     NaN          59.600000        21.500000         231.000000

        body_mass_g   sex
count    342.000000   334
unique          NaN     3
top             NaN  MALE
freq            NaN   168
mean    4201.754386   NaN
std      801.954536   NaN
min     2700.000000   NaN
25%     3550.000000   NaN
50%     4050.000000   NaN
75%     4750.000000   NaN
max     6300.000000   NaN
```

5. Check for Missing values and deal with them.



5. Check for Missing values and deal with them.

```
df.isnull()
```

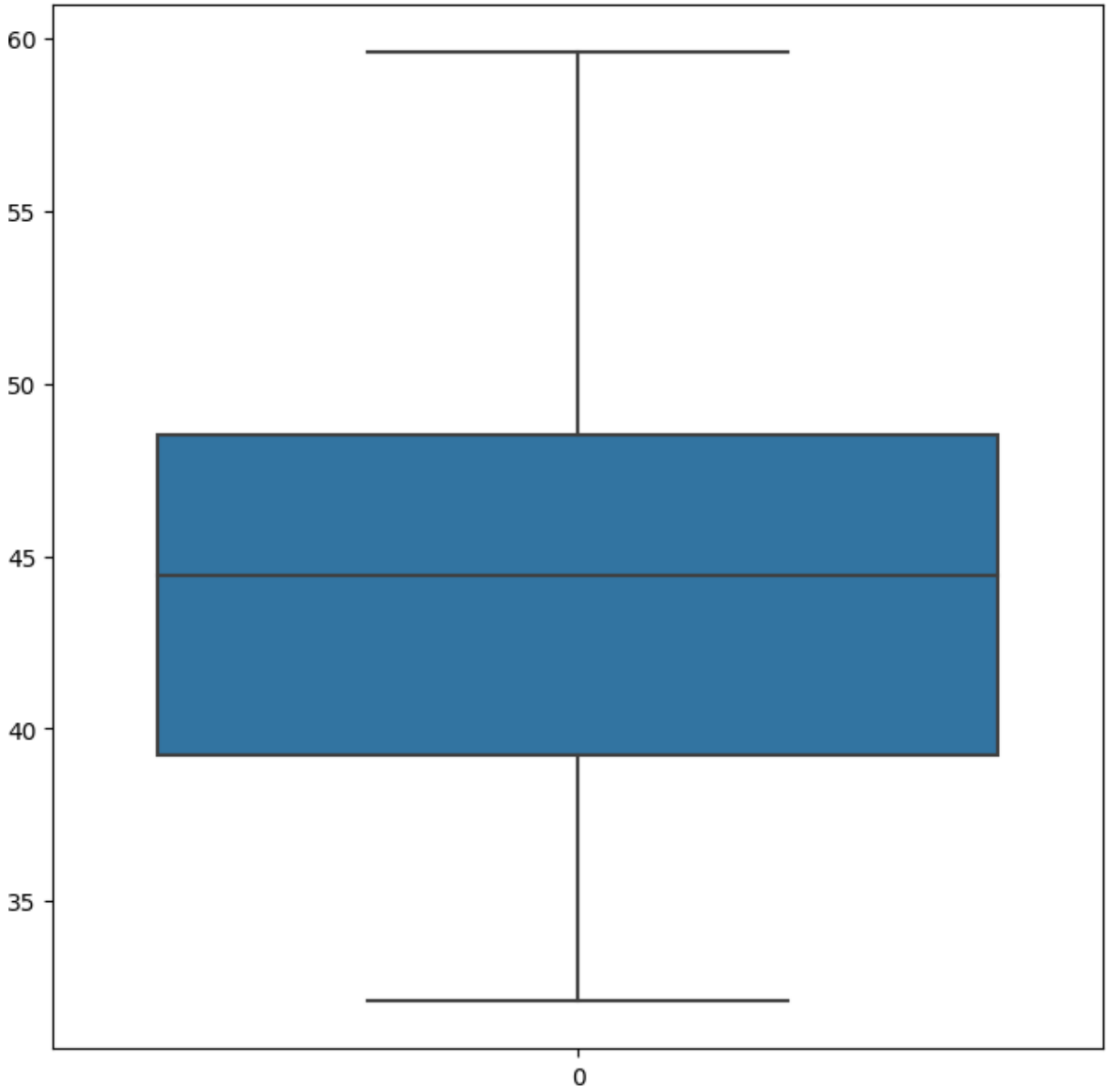
	species	island	culmen_length_mm	culmen_depth_mm	flipper_length_mm	body_mass_g	sex
0	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False
3	False	False	True	True	True	True	True
4	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...
339	False	False	True	True	True	True	True
340	False	False	False	False	False	False	False
341	False	False	False	False	False	False	False
342	False	False	False	False	False	False	False
343	False	False	False	False	False	False	False

344 rows × 7 columns

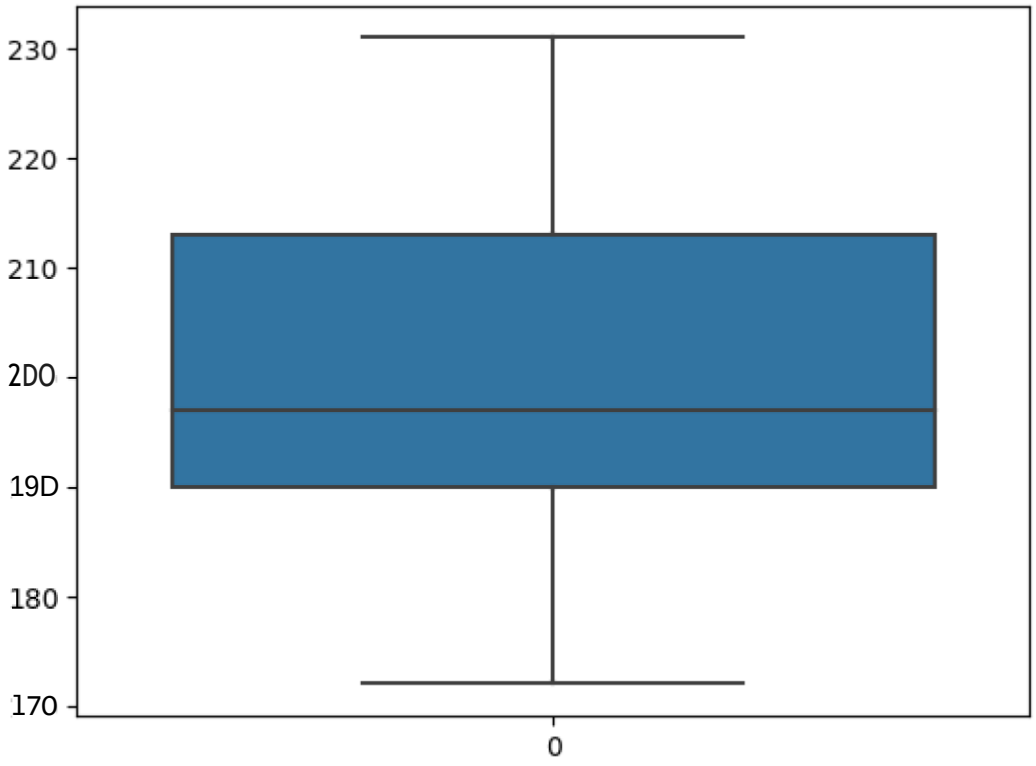
6. Find the outliers and replace them outliers.

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

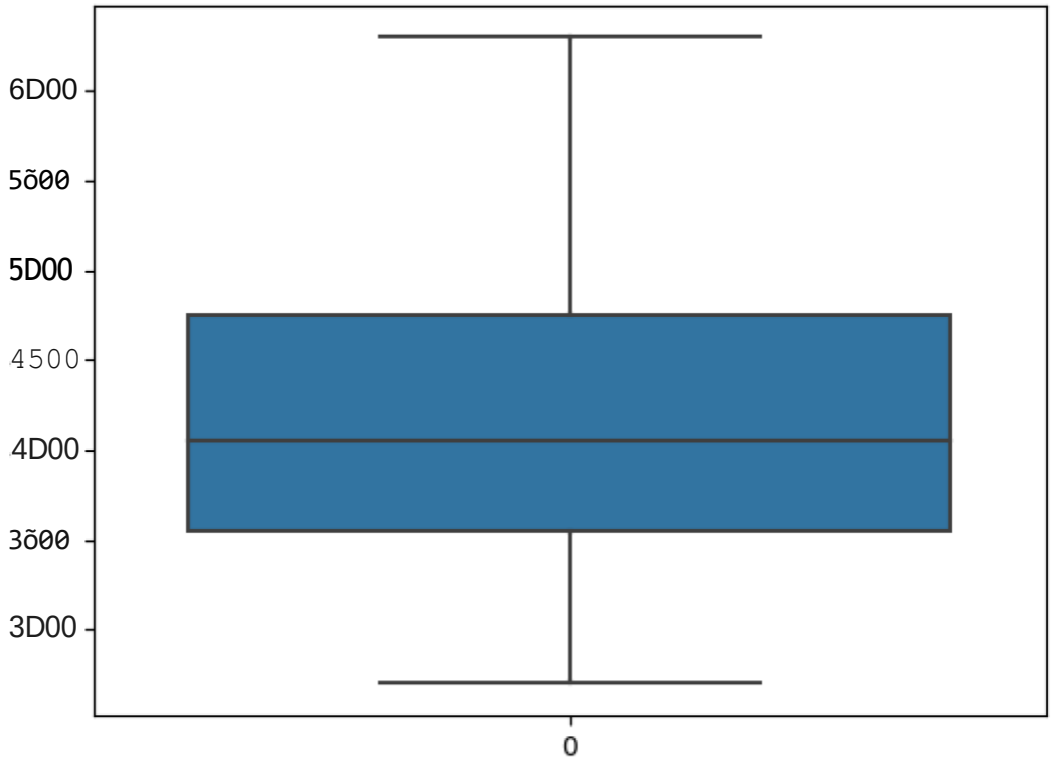
```
<Axes: >
```



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

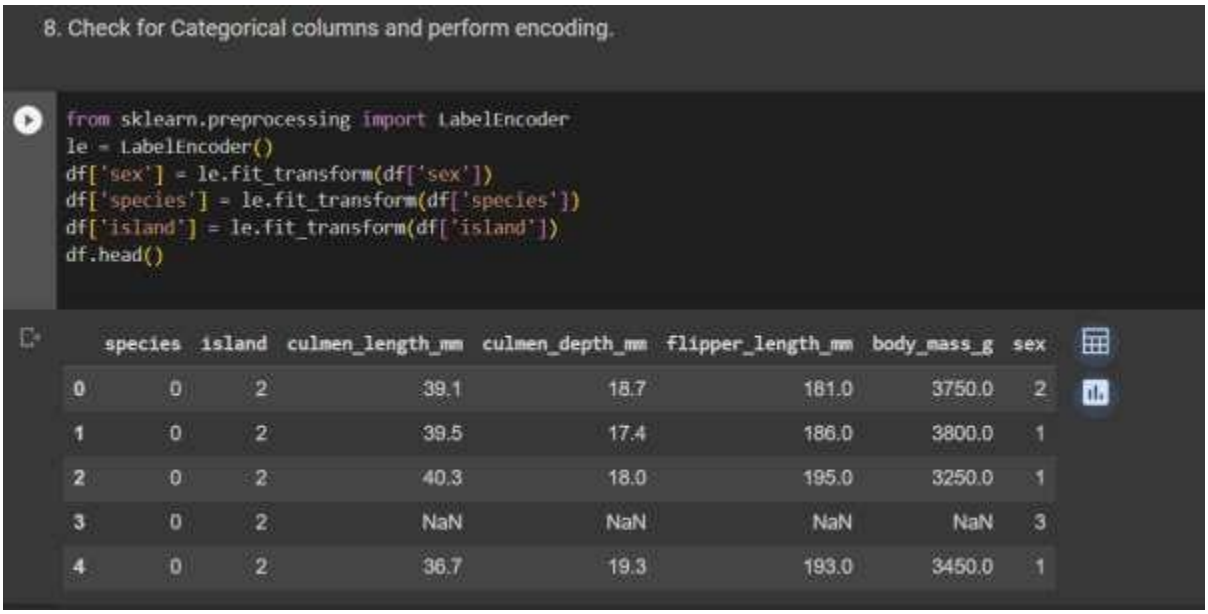


```
sns.boxplot(df.body_mass_g)
```



7.Check the correlation of independent variables with the target.

8. Check for Categorical columns and perform encoding.



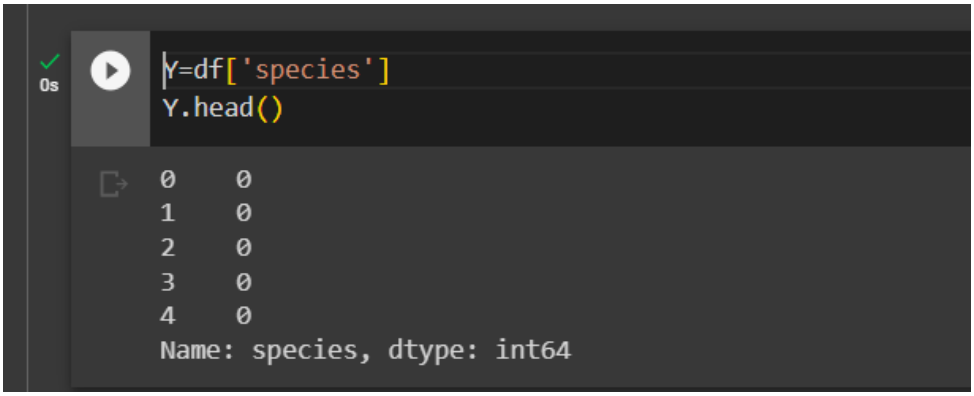
8. Check for Categorical columns and perform encoding.

```
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	body_mass_g	sex
0	0	2	39.1	18.7	181.0	3750.0	2
1	0	2	39.5	17.4	186.0	3800.0	1
2	0	2	40.3	18.0	195.0	3250.0	1
3	0	2	NaN	NaN	NaN	NaN	3
4	0	2	36.7	19.3	193.0	3450.0	1

9. Split the data into dependent and independent variables.

	island	culmen_length_mm	culmen_depth_mm	flipper_length_mm	body_mass_g	sex
0	2	39.1	18.7	181.0	3750.0	2
1	2	39.5	17.4	186.0	3800.0	1
2	2	40.3	18.0	195.0	3250.0	1
3	2	NaN	NaN	NaN	NaN	3
4	2	36.7	19.3	193.0	3450.0	1



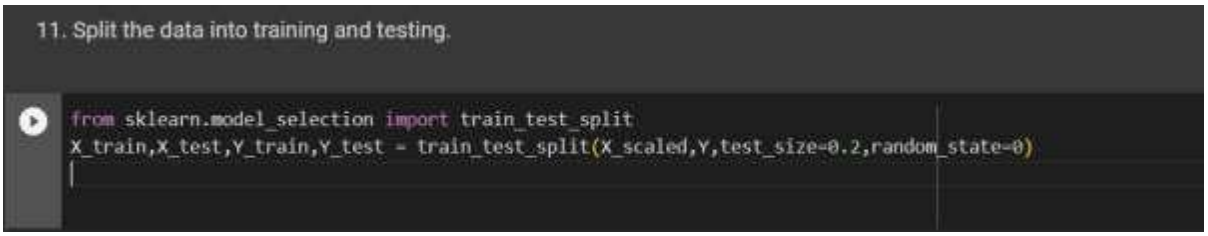
10. Scaling the data

10. Scaling the data.

```
[22] 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	sex
0	1.0	0.254545	0.666667	0.152542	0.291667	0.666667
1	1.0	0.269091	0.511905	0.237288	0.305556	0.333333
2	1.0	0.298182	0.583333	0.389831	0.152778	0.333333
3	1.0	NaN	NaN	NaN	NaN	1.000000
4	1.0	0.167273	0.738095	0.355932	0.208333	0.333333

11. Split the data into training and testing.



12.check the training and testing data shape.