Double-click (or enter) to edit

Assignment 3

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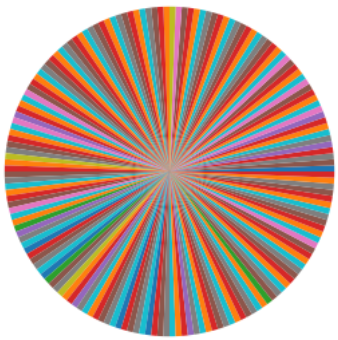
21BIT0016

```
import pandas as pd
df=pd.read_csv('/content/penguins_size.csv')
df
```

	species	island	culmen_length_mm	culmen_depth_mm	flipper_length_mm	body_ma
0	Adelie	Torgersen	39.1	18.7	181.0	3
1	Adelie	Torgersen	39.5	17.4	186.0	3
2	Adelie	Torgersen	40.3	18.0	195.0	3
3	Adelie	Torgersen	NaN	NaN	NaN	
4	Adelie	Torgersen	36.7	19.3	193.0	3
...	...	...	...	...	...	
339	Gentoo	Biscoe	NaN	NaN	NaN	
340	Gentoo	Biscoe	46.8	14.3	215.0	4
341	Gentoo	Biscoe	50.4	15.7	222.0	5
342	Gentoo	Biscoe	45.2	14.8	212.0	5
343	Gentoo	Biscoe	49.9	16.1	213.0	5

344 rows × 7 columns

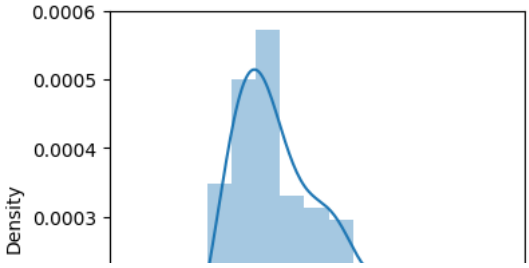
```
# Univariate Analysis
# a) Pie Chart
import matplotlib.pyplot as plt
import seaborn as sns
plt.figure(figsize=(4,4))
condition=df['sex']=='MALE'
plt.pie(condition)
plt.show()
```



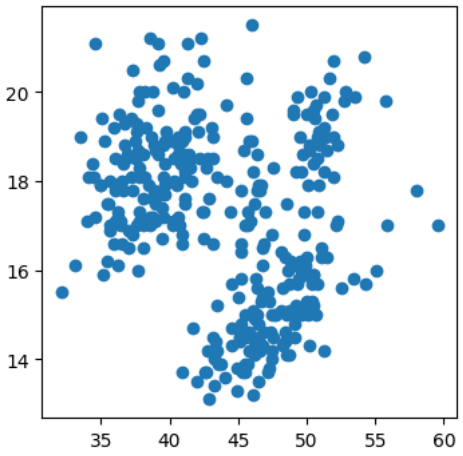
```
# Distribution Plot
plt.figure(figsize=(4,4))
sns.distplot(df['body_mass_g'])
plt.show()
```

```
<ipython-input-3-918725f44299>:3: 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
```

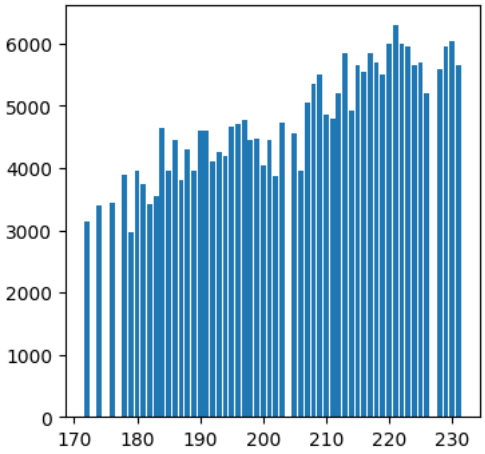
```
sns.distplot(df['body_mass_g'])
```




```
# Bivariate Anaysis
# a) Scatter graph
plt.figure(figsize=(4,4))
plt.scatter(df['culmen_length_mm'], df['culmen_depth_mm'])
plt.show()
```

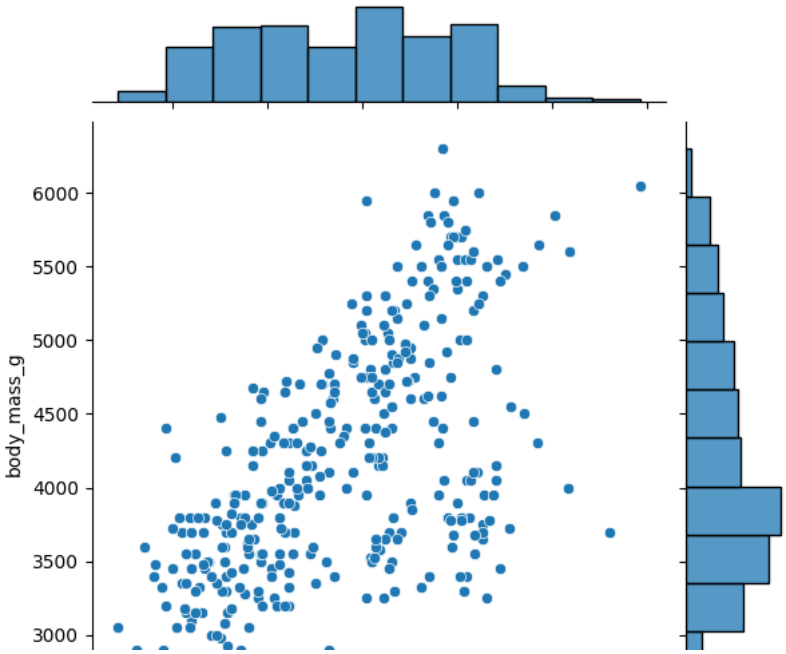



```
# b) Bar graph
plt.figure(figsize=(4,4))
plt.bar(df['flipper_length_mm'], df['body_mass_g'])
plt.show()
```



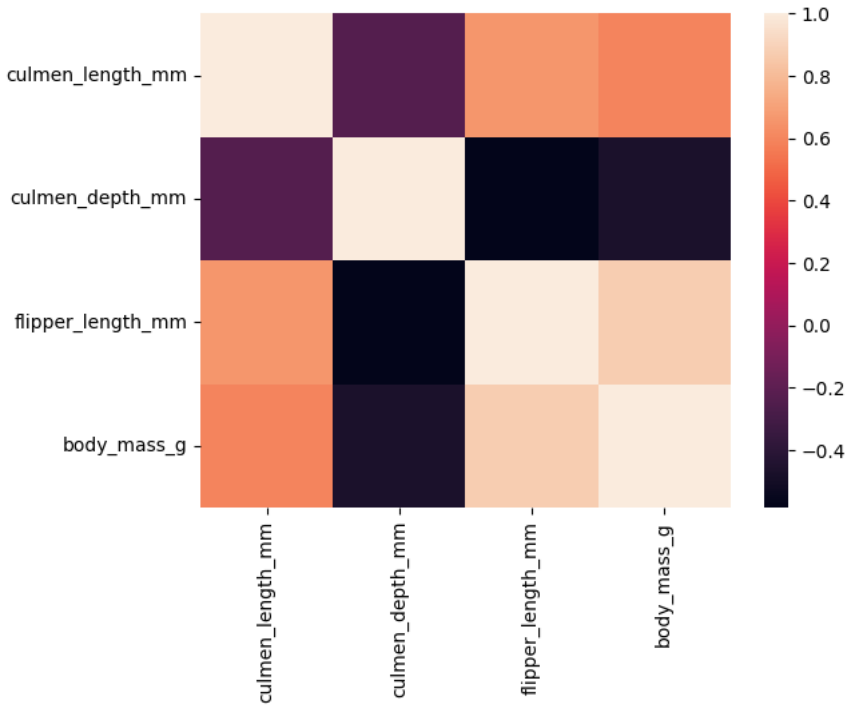

```
# c) Jointplot
sns.jointplot(x='culmen_length_mm', y='body_mass_g',data=df)
```

```
<seaborn.axisgrid.JointGrid at 0x7f8b91b91c30>
```



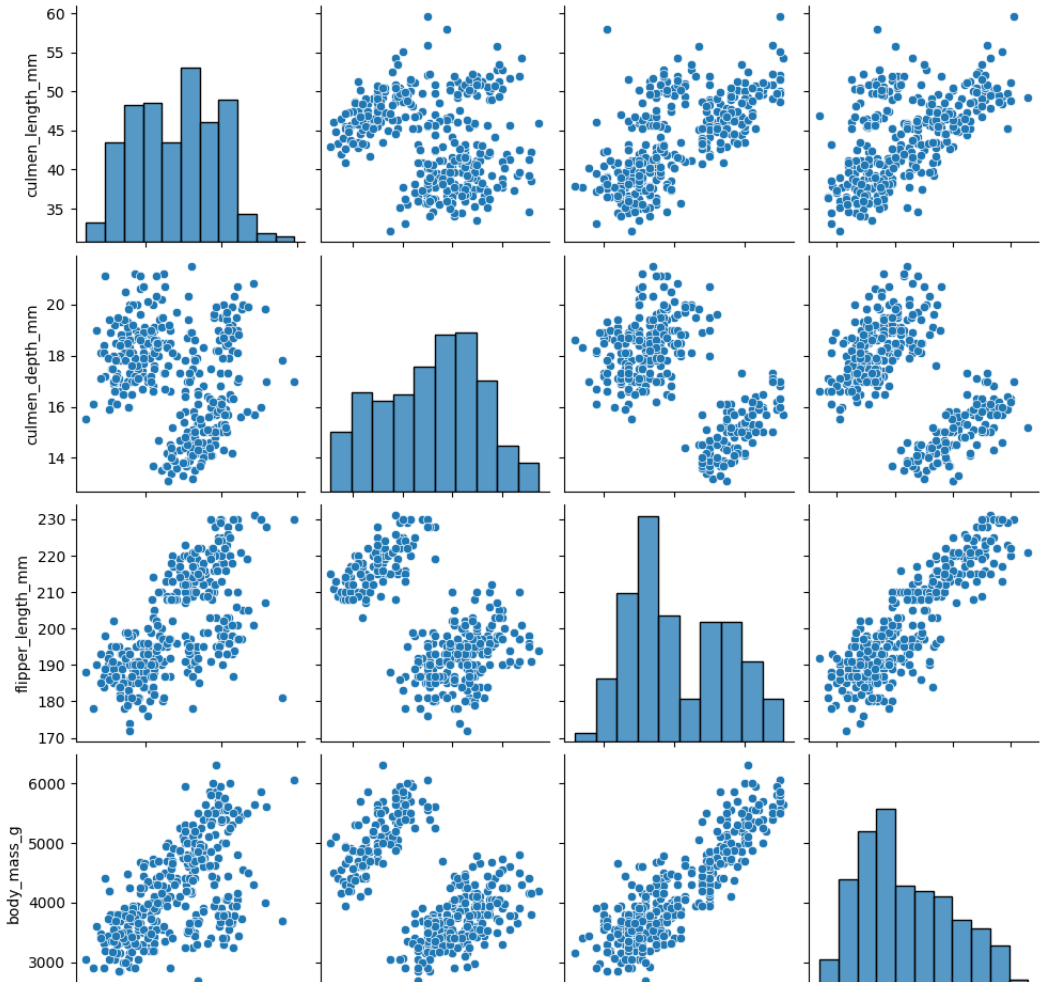

```
# Multivariate Analysis
# a) Heatmap
sns.heatmap(df.corr())
```

```
<ipython-input-7-d40a44c373f1>:3: FutureWarning: The default value of numeric_only in DataFrame.corr is
  sns.heatmap(df.corr())
<Axes: >
```




```
# b) Pairplot
sns.pairplot(df)
```

```
<seaborn.axisgrid.PairGrid at 0x7f8b91918d30>
```




```
# 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

```
# Check for Missing values and deal with them.
df.isnull().any()
```

```
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.sex.value_counts ()
```

```
MALE      168
FEMALE    165
.           1
Name: sex, dtype: int64
```

```
df['sex']=df['sex'].replace(".", "MALE")
df.sex. value_counts ()
```

```
MALE      169
FEMALE    165
Name: sex, dtype: int64
```

```
df['sex']=df['sex'].fillna ("MALE")
df.median ()
```

```
<ipython-input-13-73b9c0aff334>:2: FutureWarning: The default value of numeric_only in DataFrame.median is deprecated. In a future
  df.median ()
culmen_length_mm       44.45
culmen_depth_mm        17.30
flipper_length_mm     197.00
body_mass_g          4050.00
dtype: float64
```

```
df=df.fillna(df.median ( ))
df.isnull ().sum()
```

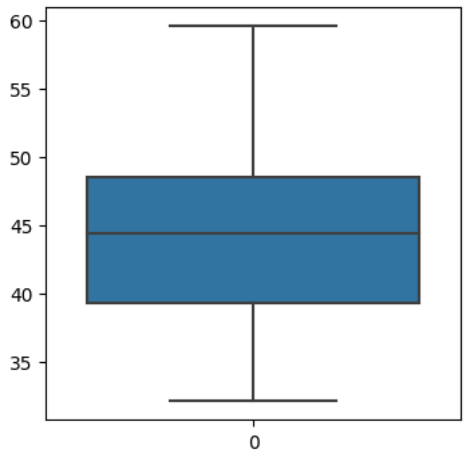
```
<ipython-input-14-fea379c4db1f>:1: FutureWarning: The default value of numeric_only in DataFrame.median is deprecated. In a future
  df=df.fillna(df.median ( ))
species              0
island               0
culmen_length_mm     0
culmen_depth_mm      0
flipper_length_mm    0
body_mass_g          0
sex                  0
dtype: int64
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 344 entries, 0 to 343
Data columns (total 7 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   species            344 non-null    object
 1   island             344 non-null    object
 2   culmen_length_mm   344 non-null    float64
 3   culmen_depth_mm    344 non-null    float64
 4   flipper_length_mm  344 non-null    float64
 5   body_mass_g        344 non-null    float64
 6   sex                344 non-null    object
dtypes: float64(4), object(3)
memory usage: 18.9+ KB
```

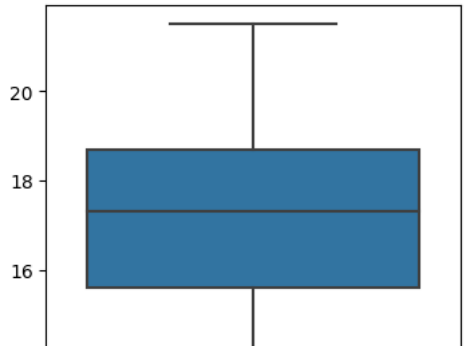
```
# Find the outliers and replace them outliers
plt.figure(figsize=(4,4))
sns.boxplot(df.culmen_length_mm)
```

```
<Axes: >
```



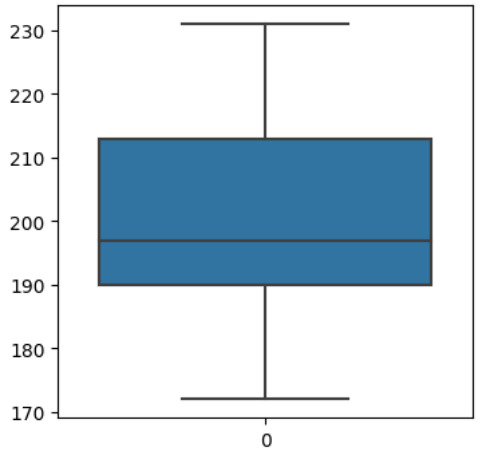

```
plt.figure(figsize=(4,4))
sns.boxplot(df.culmen_depth_mm)
```

```
<Axes: >
```



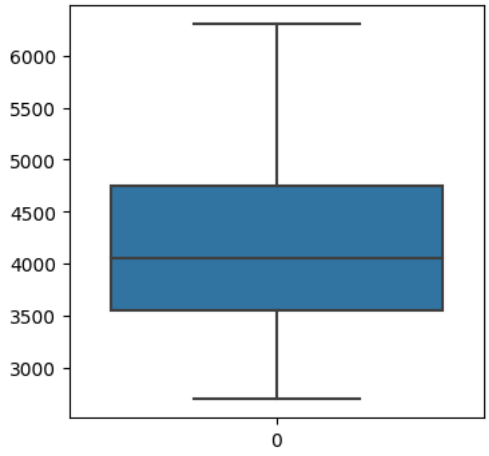

```
plt.figure(figsize=(4,4))
sns.boxplot(df.flipper_length_mm)
```

```
<Axes: >
```




```
plt.figure(figsize=(4,4))
sns.boxplot(df.body_mass_g)
```

```
<Axes: >
```




```
# no outliers
# Check for Categorical columns and perform encoding.
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 344 entries, 0 to 343
Data columns (total 7 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   species            344 non-null    object
 1   island             344 non-null    object
 2   culmen_length_mm   344 non-null    float64
 3   culmen_depth_mm    344 non-null    float64
 4   flipper_length_mm  344 non-null    float64
 5   body_mass_g        344 non-null    float64
 6   sex                344 non-null    object
dtypes: float64(4), object(3)
memory usage: 18.9+ KB
```

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

```
# Check the correlation of independent variables with the target
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                  0.010240
island              -0.635659
culmen_depth_mm     -0.741282
Name: species, dtype: float64
```

```
# Split the data into dependent and independent variables
x=df.drop(columns=['species'], axis=1)
y=df.species
x.head()
```

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

```
y.head()
```

```
0    0
1    0
2    0
3    0
4    0
Name: species, dtype: int64
```

```
# Scaling the data
from sklearn.preprocessing import MinMaxScaler
scale=MinMaxScaler()
x_s=pd.DataFrame(scale.fit_transform(x),columns=x.columns)
x_s.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	1.0
1	1.0	0.269091	0.511905	0.237288	0.305556	0.0
2	1.0	0.298182	0.583333	0.389831	0.152778	0.0
3	1.0	0.449091	0.500000	0.423729	0.375000	1.0
4	1.0	0.167273	0.738095	0.355932	0.208333	0.0

```
# 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_s,y,test_size=0.2,random_state=0)
# 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,)
```