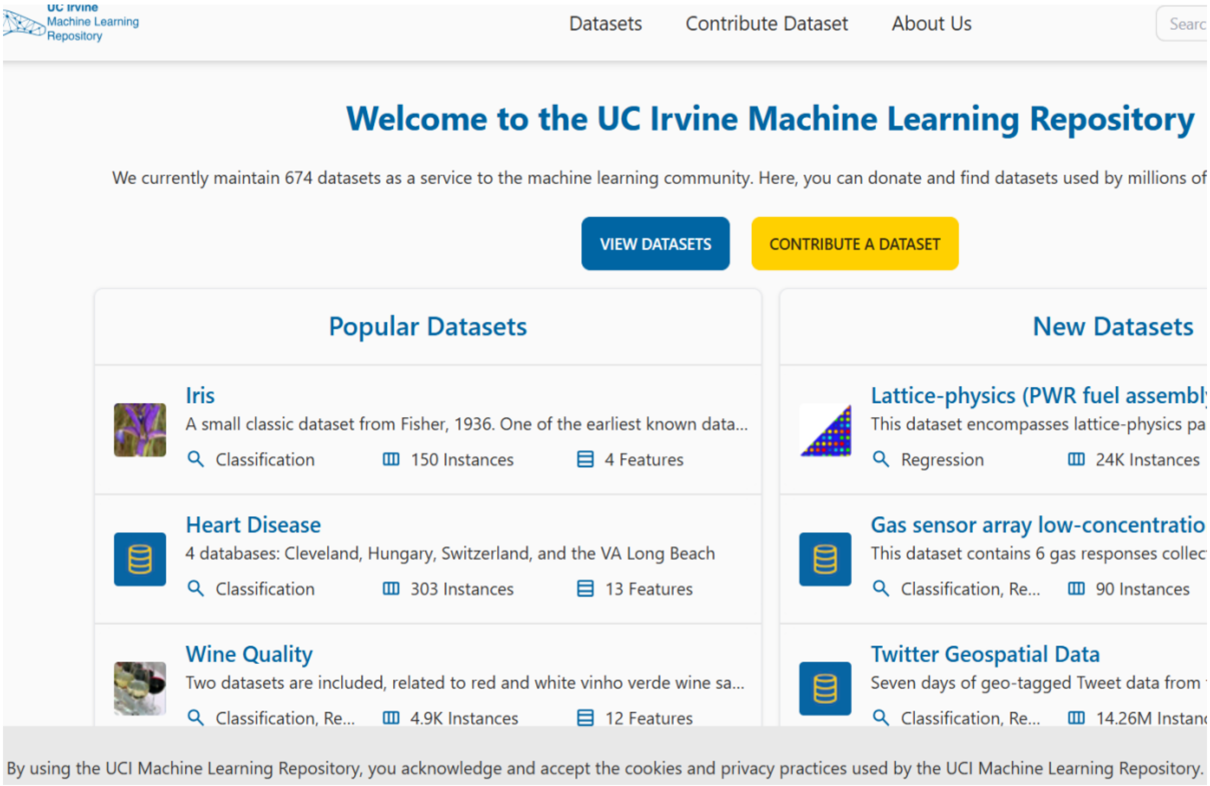
ASSIGNMENT 1

Extract the data from dataset/database using python

STEP 1: Open UCIML and select a dataset



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A small classic dataset from Fisher, 1936. One of the earliest known data...
Classification 150 Instances 4 Features

Heart Disease
4 databases: Cleveland, Hungary, Switzerland, and the VA Long Beach
Classification 303 Instances 13 Features

Wine Quality
Two datasets are included, related to red and white vinho verde wine sa...
Classification, Re... 4.9K Instances 12 Features

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Lattice-physics (PWR fuel assembl
This dataset encompasses lattice-physics pa
Regression 24K Instances

Gas sensor array low-concentratio
This dataset contains 6 gas responses collec
Classification, Re... 90 Instances

Twitter Geospatial Data
Seven days of geo-tagged Tweet data from
Classification, Re... 14.26M Instan

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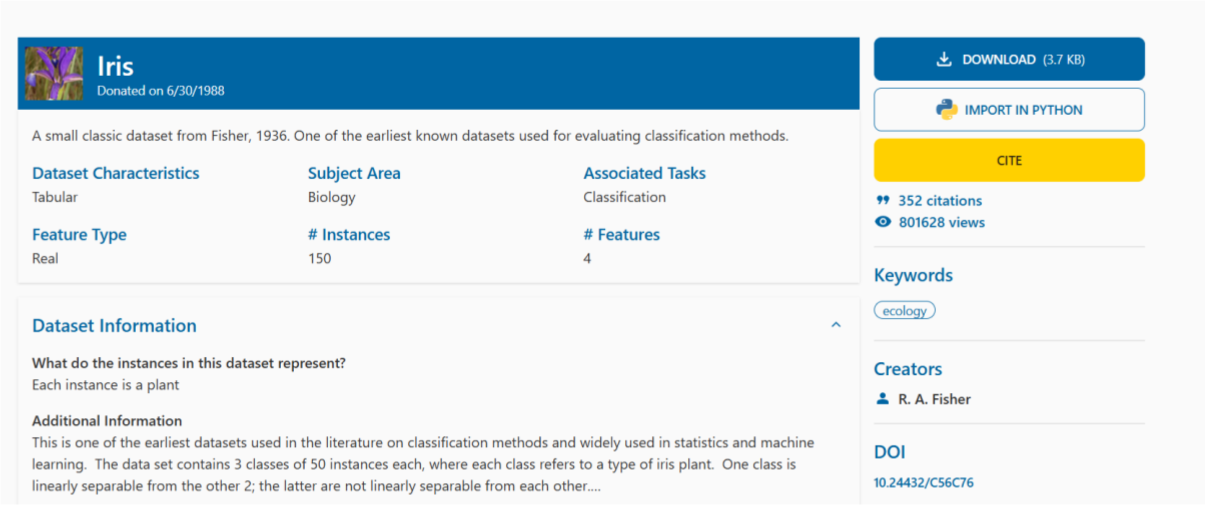
STEP 2: download data set. I have downloaded the Iris dataset



Iris

Donated on 6/30/1988

A small classic dataset from Fisher, 1936. One of the earliest known datasets used for evaluating classification methods.

Dataset Characteristics	Subject Area	Associated Tasks
Tabular	Biology	Classification
Feature Type	**# Instances**	**# Features**
Real	150	4

Dataset Information

What do the instances in this dataset represent?

Each instance is a plant

Additional Information

This is one of the earliest datasets used in the literature on classification methods and widely used in statistics and machine learning. The data set contains 3 classes of 50 instances each, where each class refers to a type of iris plant. One class is linearly separable from the other 2; the latter are not linearly separable from each other....

352 citations

801628 views

Keywords

ecology

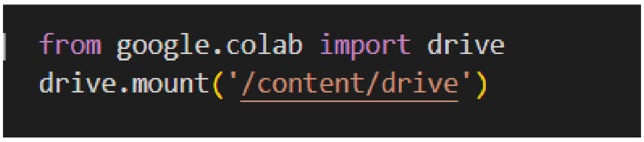
Creators

R. A. Fisher

DOI

10.24432/C56C76

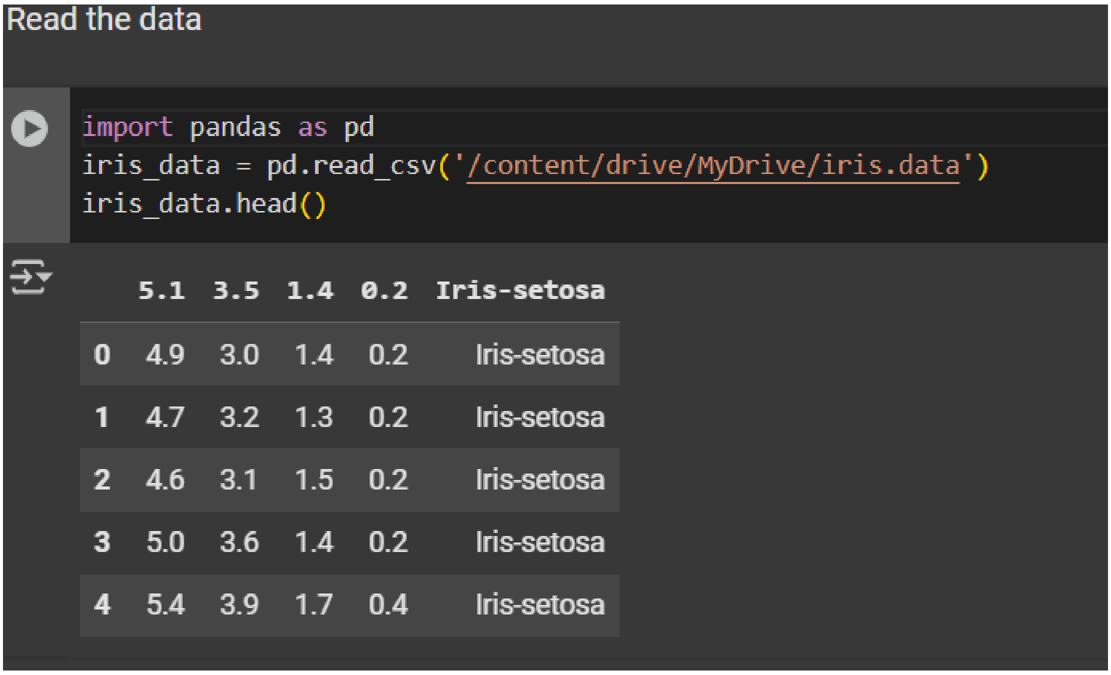
STEP 3: Open google colab and mount the dataset



```
from google.colab import drive
drive.mount('/content/drive')
```

STEP 4

To read the data

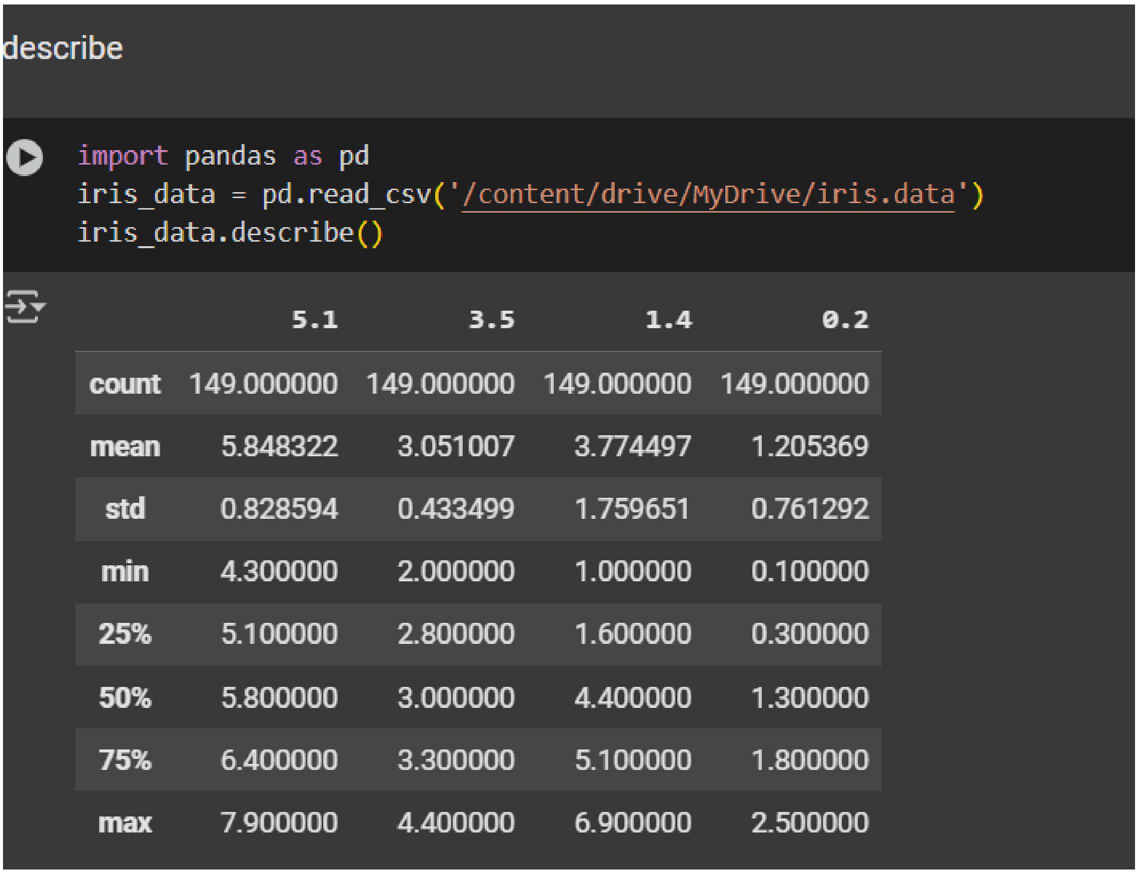


Read the data

```
import pandas as pd
iris_data = pd.read_csv('/content/drive/MyDrive/iris.data')
iris_data.head()
```

```
     5.1  3.5  1.4  0.2  Iris-setosa
0    4.9  3.0  1.4  0.2  Iris-setosa
1    4.7  3.2  1.3  0.2  Iris-setosa
2    4.6  3.1  1.5  0.2  Iris-setosa
3    5.0  3.6  1.4  0.2  Iris-setosa
4    5.4  3.9  1.7  0.4  Iris-setosa
```

STEP 5: To describe the data

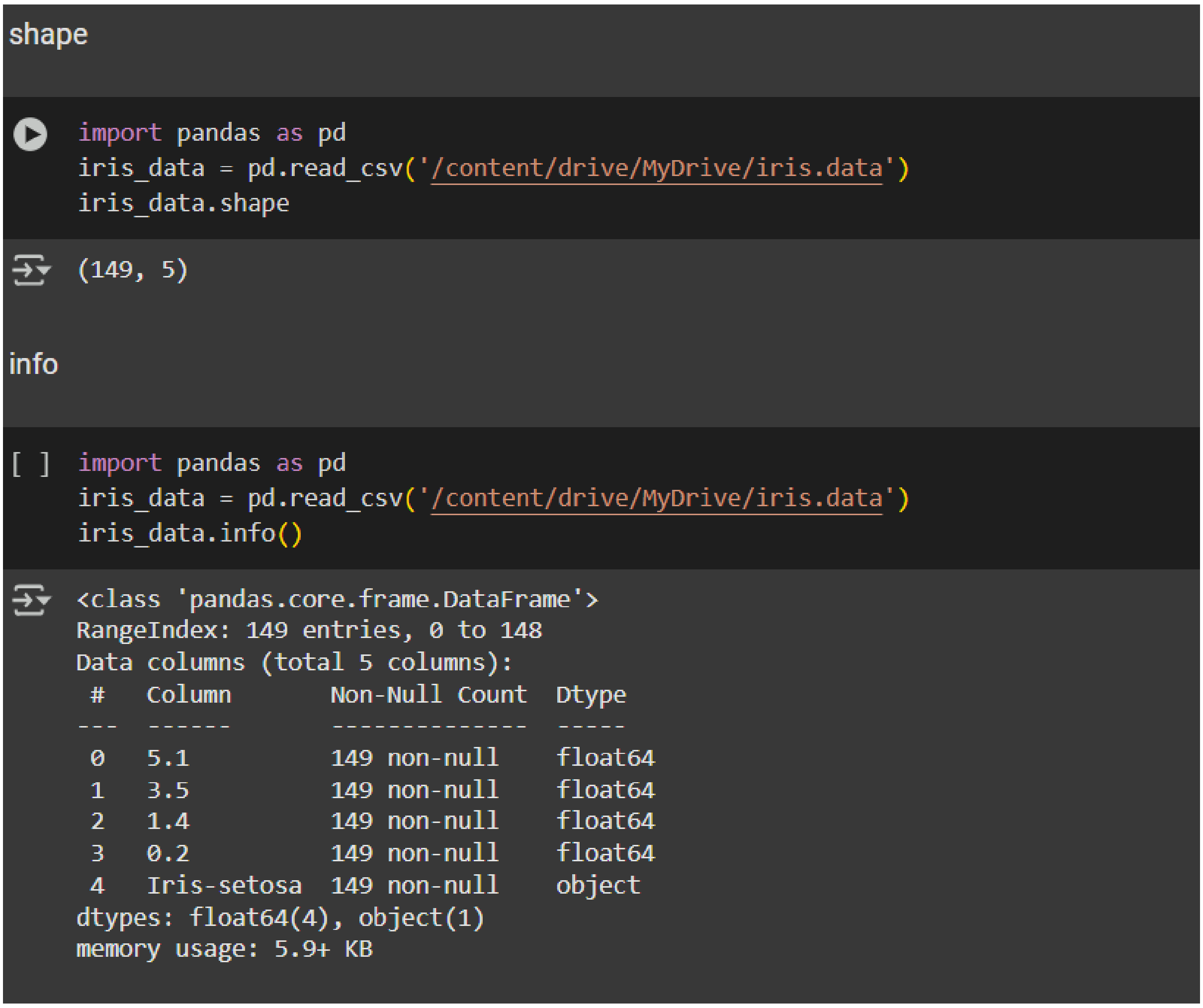


describe

```
import pandas as pd
iris_data = pd.read_csv('/content/drive/MyDrive/iris.data')
iris_data.describe()
```

	5.1	3.5	1.4	0.2
count	149.000000	149.000000	149.000000	149.000000
mean	5.848322	3.051007	3.774497	1.205369
std	0.828594	0.433499	1.759651	0.761292
min	4.300000	2.000000	1.000000	0.100000
25%	5.100000	2.800000	1.600000	0.300000
50%	5.800000	3.000000	4.400000	1.300000
75%	6.400000	3.300000	5.100000	1.800000
max	7.900000	4.400000	6.900000	2.500000

STEP 6 : To shape and info to data



shape

```
import pandas as pd
iris_data = pd.read_csv('/content/drive/MyDrive/iris.data')
iris_data.shape
```

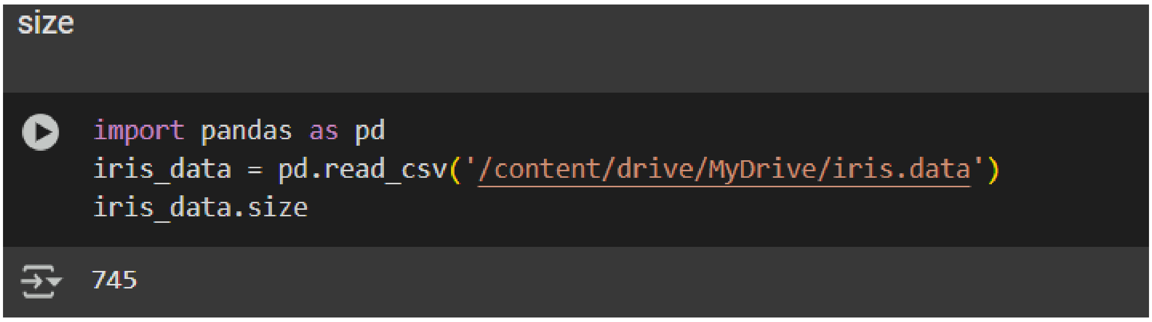
```
(149, 5)
```

info

```
import pandas as pd
iris_data = pd.read_csv('/content/drive/MyDrive/iris.data')
iris_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 149 entries, 0 to 148
Data columns (total 5 columns):
 #   Column       Non-Null Count  Dtype  
---  ------       --------------  -----  
 0   5.1          149 non-null    float64
 1   3.5          149 non-null    float64
 2   1.4          149 non-null    float64
 3   0.2          149 non-null    float64
 4   Iris-setosa  149 non-null    object 
dtypes: float64(4), object(1)
memory usage: 5.9+ KB
```

STEP 7: For size of the data

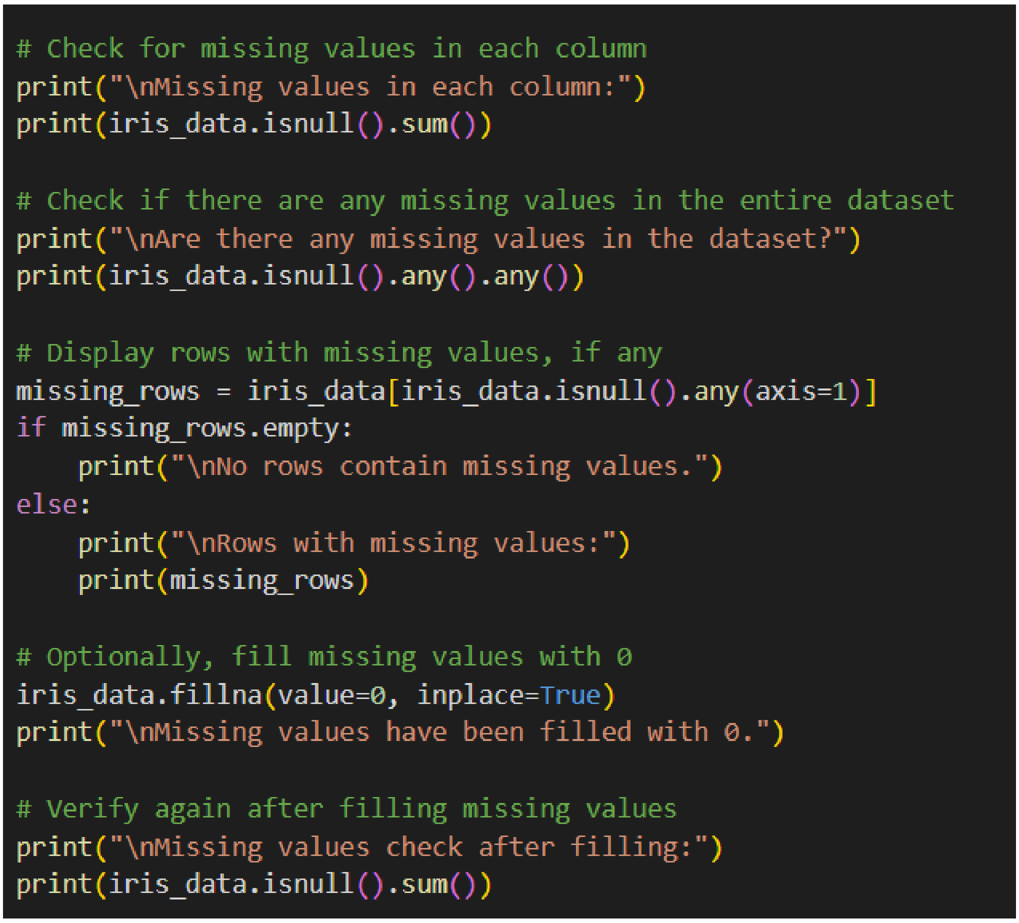


size

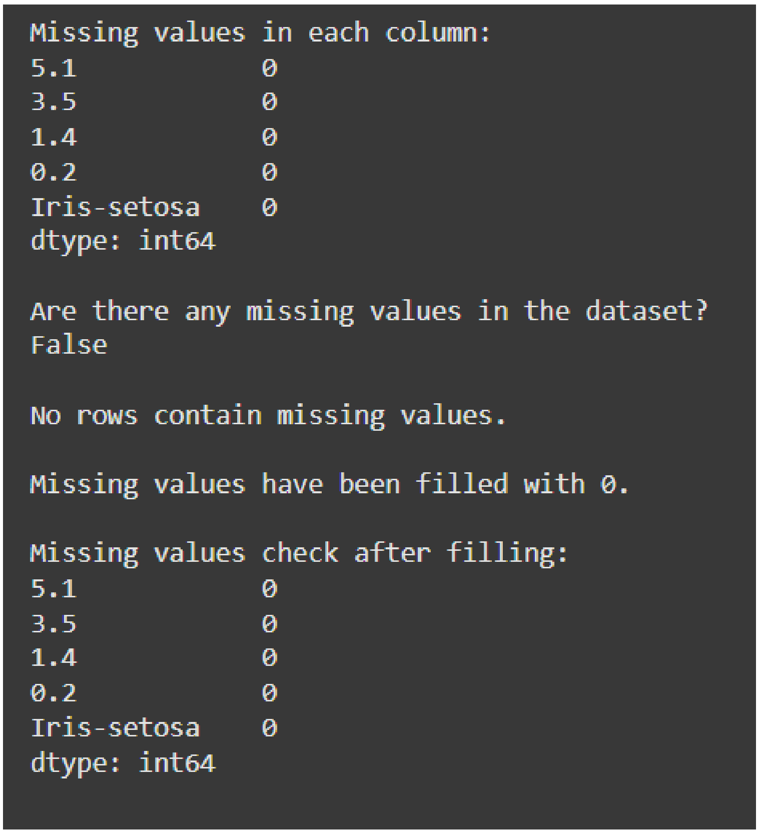
```
import pandas as pd
iris_data = pd.read_csv('/content/drive/MyDrive/iris.data')
iris_data.size
```

```
745
```

STEP 8 : to check is null or not

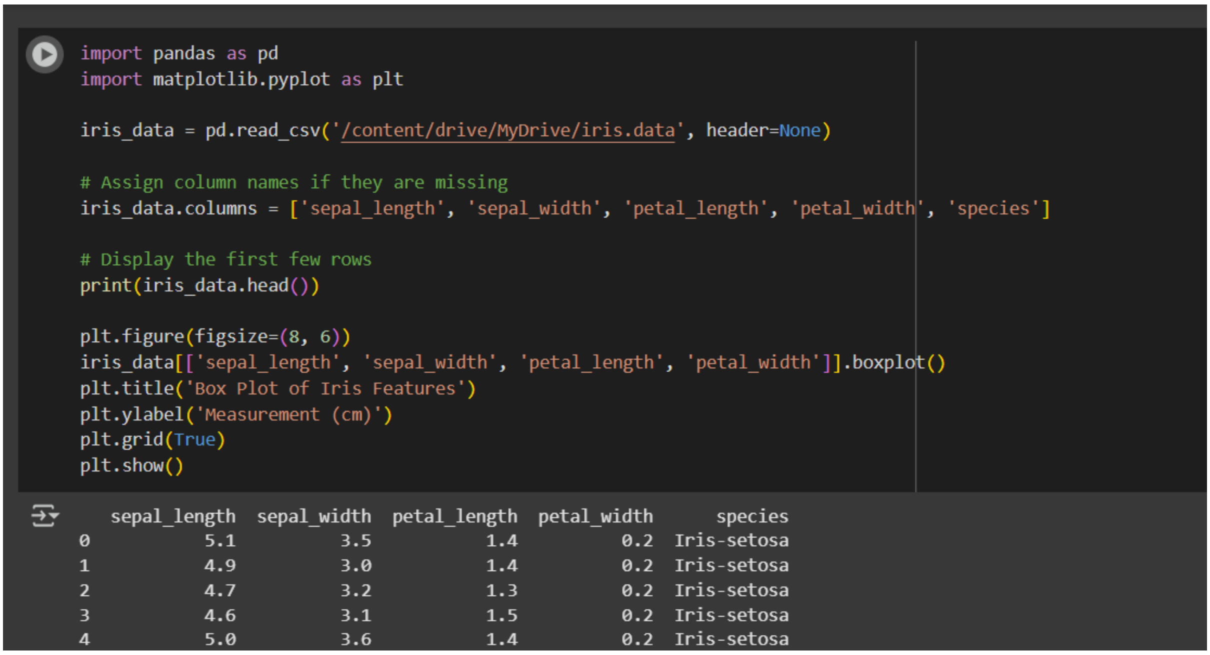


```python
# Check for missing values in each column
print("\nMissing values in each column:")
print(iris_data.isnull().sum())

# Check if there are any missing values in the entire dataset
print("\nAre there any missing values in the dataset?")
print(iris_data.isnull().any().any())

# Display rows with missing values, if any
missing_rows = iris_data[iris_data.isnull().any(axis=1)]
if missing_rows.empty:
    print("\nNo rows contain missing values.")
else:
    print("\nRows with missing values:")
    print(missing_rows)

# Optionally, fill missing values with 0
iris_data.fillna(value=0, inplace=True)
print("\nMissing values have been filled with 0.")

# Verify again after filling missing values
print("\nMissing values check after filling:")
print(iris_data.isnull().sum())
```



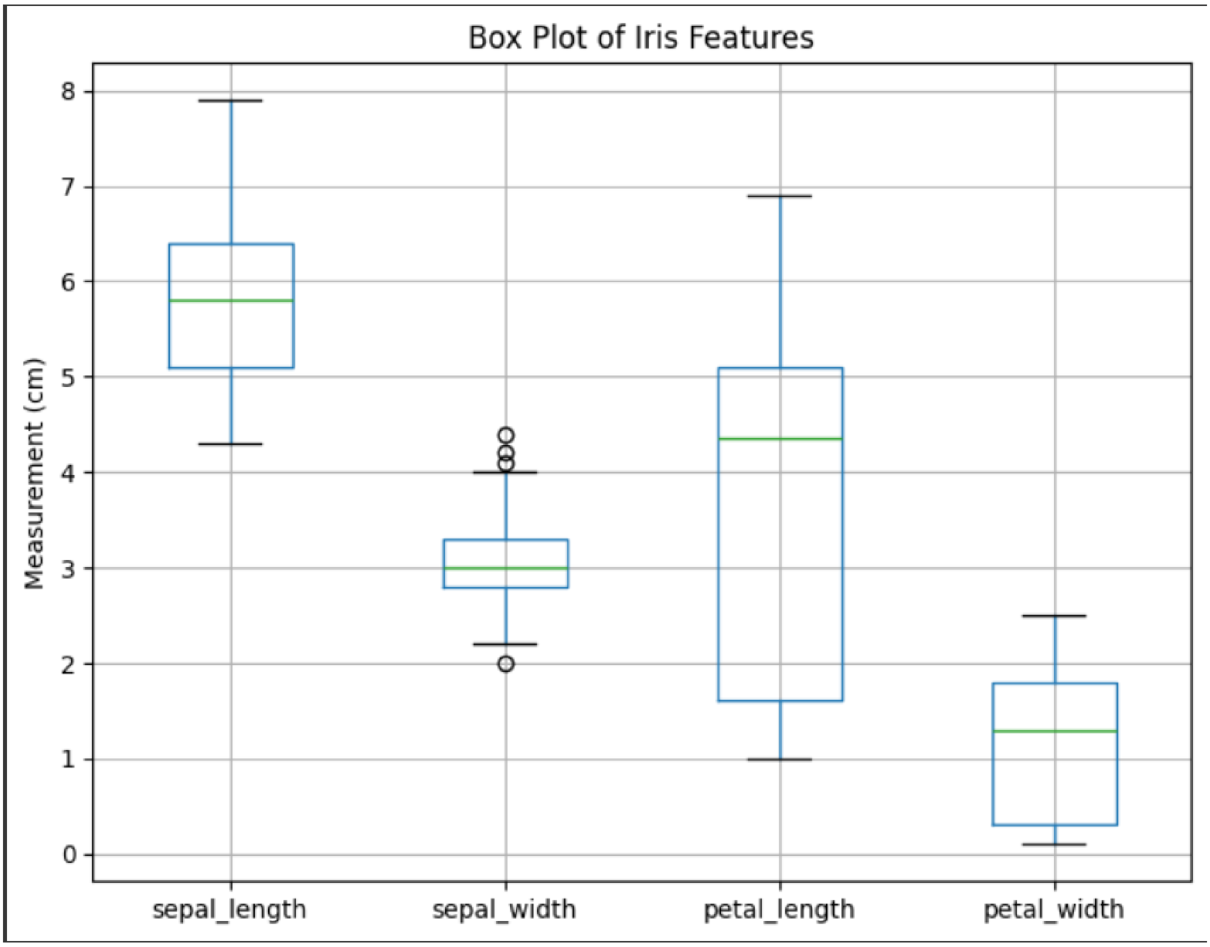
```
Missing values in each column:
5.1            0
3.5            0
1.4            0
0.2            0
Iris-setosa    0
dtype: int64

Are there any missing values in the dataset?
False

No rows contain missing values.

Missing values have been filled with 0.

Missing values check after filling:
5.1            0
3.5            0
1.4            0
0.2            0
Iris-setosa    0
dtype: int64
```

STEP 9: to plot a graph we use matplotlib / seaborn library. Here, I have plotted a box plot/hostoplot

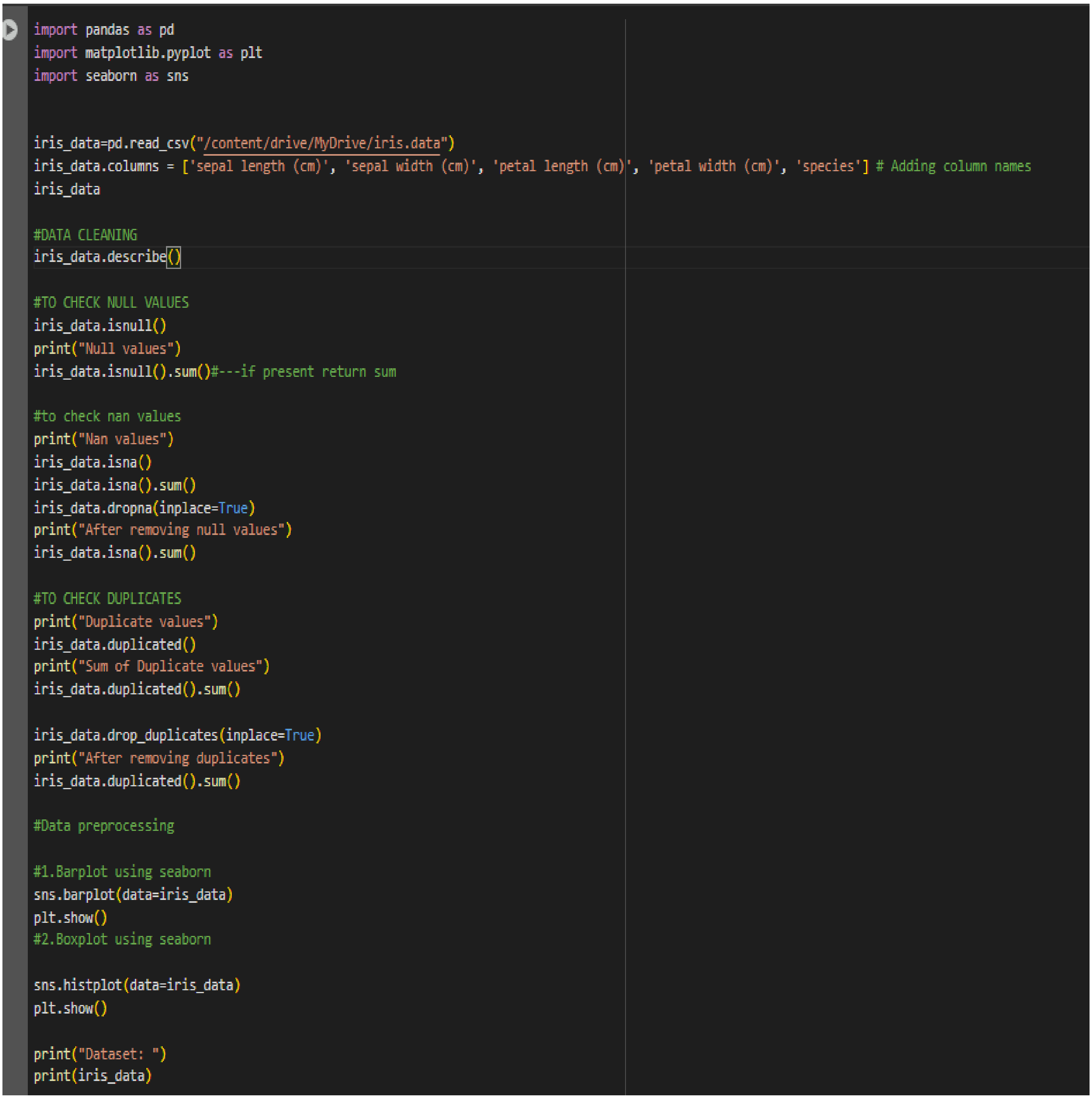


```
import pandas as pd
import matplotlib.pyplot as plt

iris_data = pd.read_csv('/content/drive/MyDrive/iris.data', header=None)

# Assign column names if they are missing
iris_data.columns = ['sepal_length', 'sepal_width', 'petal_length', 'petal_width', 'species']

# Display the first few rows
print(iris_data.head())

plt.figure(figsize=(8, 6))
iris_data[['sepal_length', 'sepal_width', 'petal_length', 'petal_width']].boxplot()
plt.title('Box Plot of Iris Features')
plt.ylabel('Measurement (cm)')
plt.grid(True)
plt.show()
```

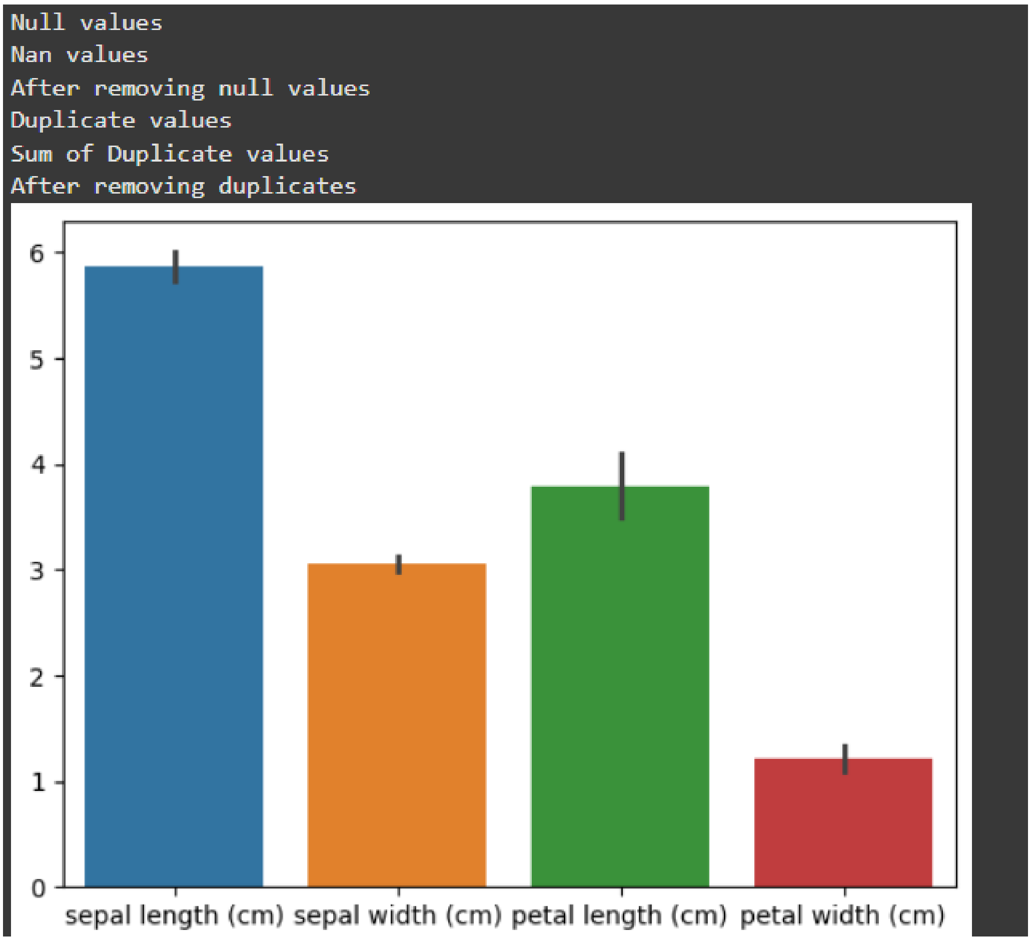
```
   sepal_length  sepal_width  petal_length  petal_width      species
0           5.1          3.5           1.4          0.2  Iris-setosa
1           4.9          3.0           1.4          0.2  Iris-setosa
2           4.7          3.2           1.3          0.2  Iris-setosa
3           4.6          3.1           1.5          0.2  Iris-setosa
4           5.0          3.6           1.4          0.2  Iris-setosa
```



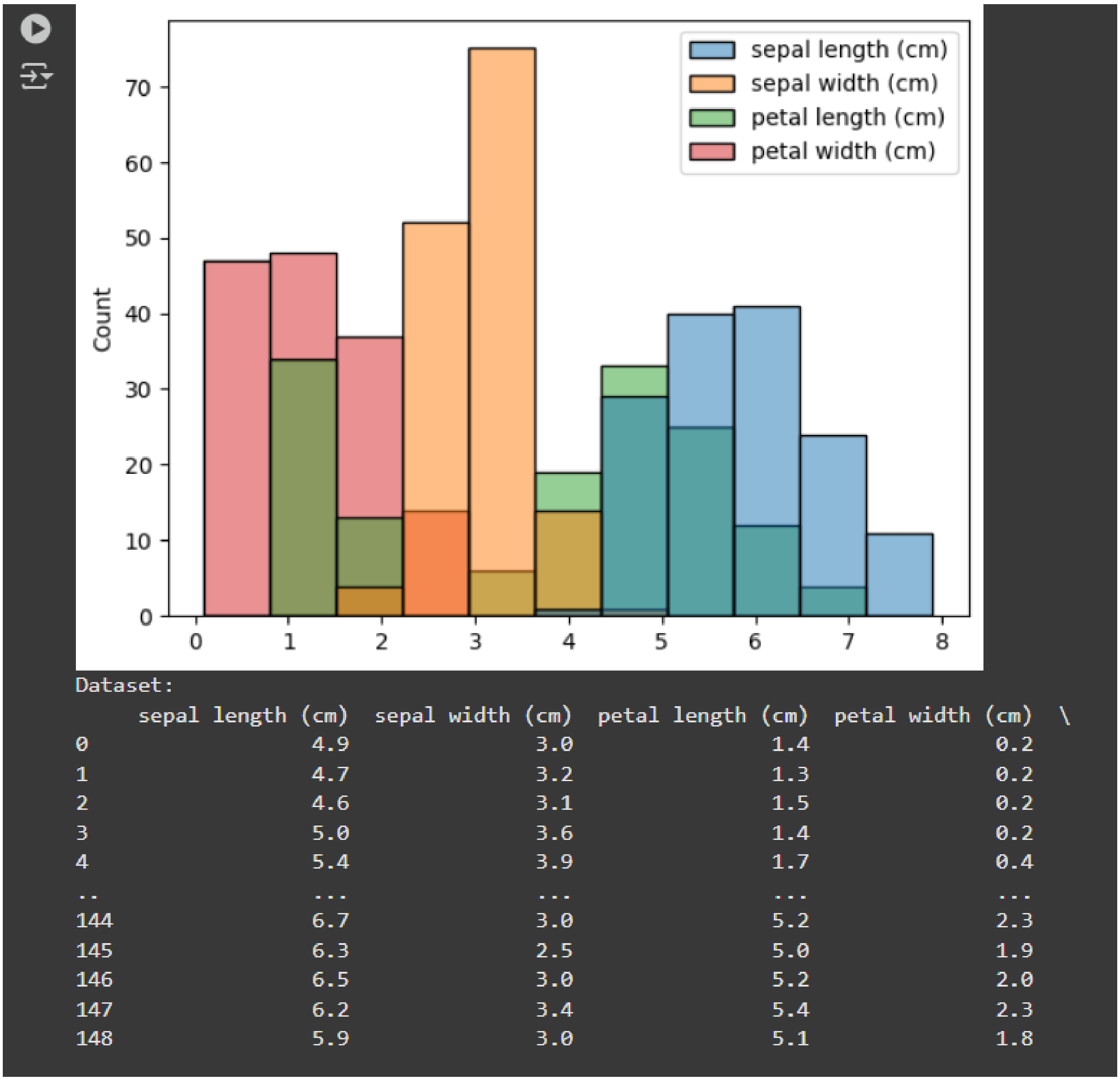
STEP 10: Here's the complete code to achieve all the mentioned tasks:



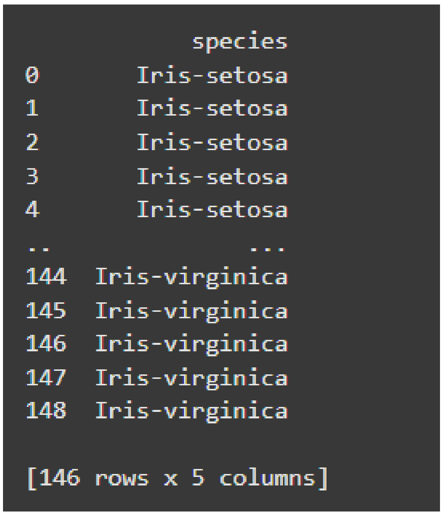
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns


iris_data=pd.read_csv("/content/drive/MyDrive/iris.data")
iris_data.columns = ['sepal length (cm)', 'sepal width (cm)', 'petal length (cm)', 'petal width (cm)', 'species'] # Adding column names
iris_data

#DATA CLEANING
iris_data.describe()

#TO CHECK NULL VALUES
iris_data.isnull()
print("Null values")
iris_data.isnull().sum()#---if present return sum

#to check nan values
print("Nan values")
iris_data.isna()
iris_data.isna().sum()
iris_data.dropna(inplace=True)
print("After removing null values")
iris_data.isna().sum()

#TO CHECK DUPLICATES
print("Duplicate values")
iris_data.duplicated()
print("Sum of Duplicate values")
iris_data.duplicated().sum()

iris_data.drop_duplicates(inplace=True)
print("After removing duplicates")
iris_data.duplicated().sum()

#Data preprocessing

#1.Barplot using seaborn
sns.barplot(data=iris_data)
plt.show()
#2.Boxplot using seaborn

sns.histplot(data=iris_data)
plt.show()

print("Dataset: ")
print(iris_data)
```



```
Null values
Nan values
After removing null values
Duplicate values
Sum of Duplicate values
After removing duplicates
```



```
Dataset:
     sepal length (cm)  sepal width (cm)  petal length (cm)  petal width (cm)  \
0                  4.9               3.0                1.4               0.2
1                  4.7               3.2                1.3               0.2
2                  4.6               3.1                1.5               0.2
3                  5.0               3.6                1.4               0.2
4                  5.4               3.9                1.7               0.4
..                 ...               ...                ...               ...
144                6.7               3.0                5.2               2.3
145                6.3               2.5                5.0               1.9
146                6.5               3.0                5.2               2.0
147                6.2               3.4                5.4               2.3
148                5.9               3.0                5.1               1.8
```



```
            species
0       Iris-setosa
1       Iris-setosa
2       Iris-setosa
3       Iris-setosa
4       Iris-setosa
..              ...
144  Iris-virginica
145  Iris-virginica
146  Iris-virginica
147  Iris-virginica
148  Iris-virginica

[146 rows x 5 columns]
```

THANK YOU 😊