```python
# Assignment 8 : Matplotlib

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'''

1.      A bar chart is drawn(using pyplot) to represent sales data of various models of cars,
for a month. Write appropriate statements in Python to provide labels Month - June and Sale
done to x and y axis respectively

'''

import matplotlib.pyplot as plt


# Sample data for car sales in June

car_models = ['Model A', 'Model B', 'Model C', 'Model D']

sales_data = [150, 200, 180, 220]  # Sample sales figures for each model


# Plotting the bar chart

plt.bar(car_models, sales_data)


# Adding labels to the axes

plt.xlabel('Month - June')  # Label for x-axis

plt.ylabel('Sale')  # Label for y-axis


# Display the plot

plt.show()
```
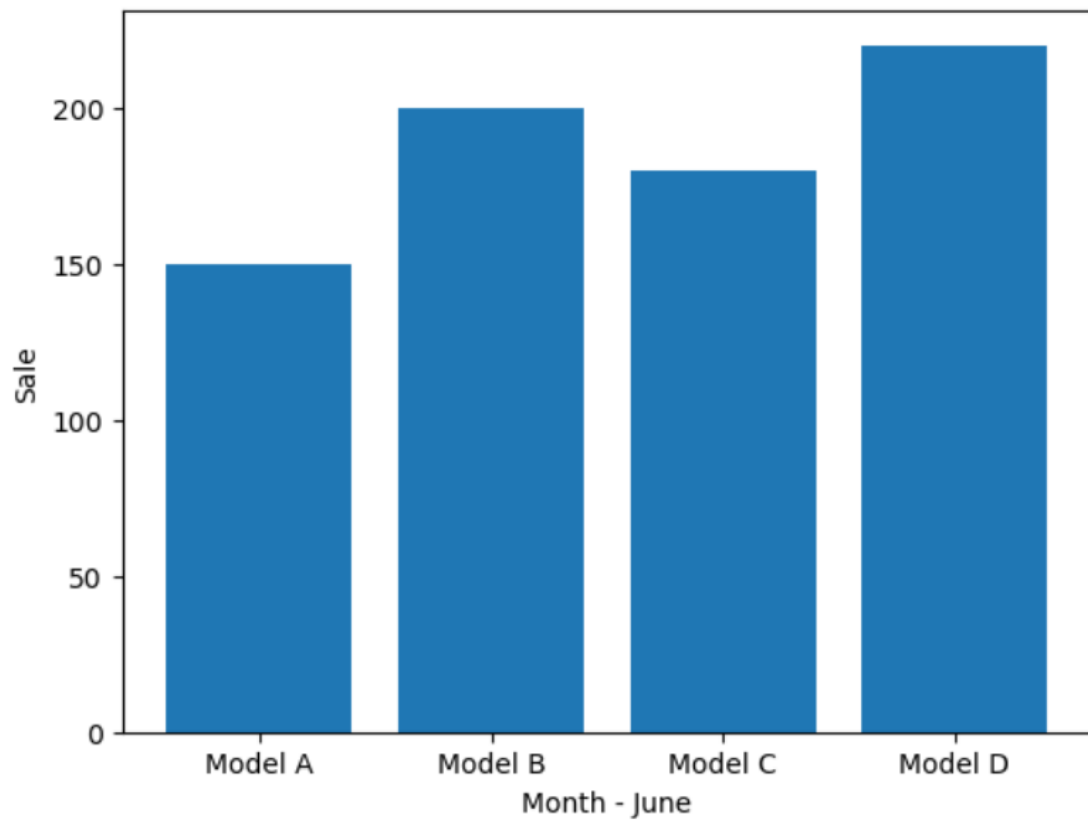
#OutPut

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2.   Write a method/function DISPLAYWORDS() in python to read lines from a text file STORY.TXT, and display those words, which are less than 4 characters

'''

```python
def display_words():
    try:
        # Open the file for reading
        with open("STORY.TXT", 'r') as file:
            # Read lines from the file
            lines = file.readlines()
            # Iterate through each line
            for line in lines:
                # Split the line into words
                words = line.split()
                # Iterate through each word
                for word in words:
                    # Check if the word has less than 4 characters
                    if len(word) < 4:
                        # Display the word
                        print(word)
    except FileNotFoundError:
        print("File not found.")
    except Exception as e:
        print("An error occurred:", e)


# Call the function to display words less than 4 characters
display_words()
```

#OutPut

'''

How

are

you

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'''

3.   Create the following DataFrame Sales containing year-wise sales figures for five salespersons in INR. Use the years as column labels, and salesperson names as row labels.

'''

```python
import pandas as pd


# Create the DataFrame Sales
sales_data = {
    'Madhu': [100.5, 12000, 20000, 50000],
    'Kusum': [150.8, 18000, 50000, 60000],
    'Kinshuk': [200.9, 22000, 70000, 70000],
    'Ankit': [30000, 30000, 10000, 80000],
    'Shruti': [40000, 45000, 125000, 90000]
}
years = [2014, 2015, 2016, 2017]


sales = pd.DataFrame(sales_data, index=years)


# a) Display the row labels of Sales
print("Row labels of Sales:")
print(sales.index)


# b) Display the column labels of Sales
print("\nColumn labels of Sales:")
print(sales.columns)


# c) Display the data types of each column of Sales
print("\nData types of each column of Sales:")
print(sales.dtypes)


# d) Display the last two rows of Sales
print("\nLast two rows of Sales:")
print(sales.tail(2))
```

```python
# e) Display the dimensions, shape, size and values of Sales
print("\nDimensions of Sales:")
print(sales.ndim)
print("\nShape of Sales:")
print(sales.shape)
print("\nSize of Sales:")
print(sales.size)
print("\nValues of Sales:")
print(sales.values)


# f) Display the last two rows of Sales (again, as it was missed previously)
print("\nLast two rows of Sales:")
print(sales.iloc[-2:])


# g) Display the first two columns of Sales
print("\nFirst two columns of Sales:")
print(sales.iloc[:, :2])


# h) Create a dictionary using the provided data and use it to create DataFrame Sales2
sales_data2 = {
    'Year': [2019, 2020, 2021, 2022],
    'John': [50000, 60000, 70000, 80000],
    'Alice': [45000, 55000, 65000, 75000],
    'Bob': [40000, 50000, 60000, 70000],
    'Emily': [35000, 45000, 55000, 65000],
    'David': [30000, 40000, 50000, 60000]
}


sales2 = pd.DataFrame(sales_data2)
print("\nDataFrame Sales2:")
print(sales2)
```

#OutPut

'''

Row labels of Sales:

Index([2014, 2015, 2016, 2017], dtype='int64')

Column labels of Sales:

Index(['Madhu', 'Kusum', 'Kinshuk', 'Ankit', 'Shruti'], dtype='object')

Data types of each column of Sales:

Madhu   float64

Kusum   float64

Kinshuk   float64

Ankit   int64

Shruti   int64

dtype: object

Last two rows of Sales:

      Madhu   Kusum Kinshuk Ankit Shruti

2016 20000.0 50000.0 70000.0 10000 125000

2017 50000.0 60000.0 70000.0 80000   90000

Dimensions of Sales:

2

Shape of Sales:

(4, 5)

Size of Sales:

20

Values of Sales:

[[1.005e+02 1.508e+02 2.009e+02 3.000e+04 4.000e+04]

 [1.200e+04 1.800e+04 2.200e+04 3.000e+04 4.500e+04]

 [2.000e+04 5.000e+04 7.000e+04 1.000e+04 1.250e+05]

 [5.000e+04 6.000e+04 7.000e+04 8.000e+04 9.000e+04]]

Last two rows of Sales:

      Madhu   Kusum Kinshuk Ankit Shruti

2016 20000.0 50000.0 70000.0 10000 125000

2017 50000.0 60000.0 70000.0 80000   90000

First two columns of Sales:

      Madhu   Kusum

2014   100.5   150.8

2015 12000.0 18000.0

2016 20000.0 50000.0

2017 50000.0 60000.0

DataFrame Sales2:

   Year John Alice   Bob Emily David

0 2019 50000 45000 40000 35000 30000

1 2020 60000 55000 50000 45000 40000

2 2021 70000 65000 60000 55000 50000

3 2022 80000 75000 70000 65000 60000

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