1. Write a program to demonstrate basic datatype in python:

```
a=10

b="Python"

c = 10.5

d=2.14j

e=True

print("Data type of Variable a :",type(a))

print("Data type of Variable b :",type(b))

print("Data type of Variable c :",type(c))

print("Data type of Variable d :",type(d))

print("Data type of Variable e :",type(e))
```

Output:

Data type of Variable a :<class 'int'>

Data type of Variable b : <class 'str'>

Data type of Variable c : <class 'str'>

Data type of Variable d : <class 'complex'>

Data type of Variable e :<class 'bool'>

2. Create a list and perform the following methods.

a) insert( ) b) remove( ) c) append( ) d) pop( ) e) clear( )

```
a=[1,3,5,6,7,4,"hello"]

print(a)

#insert()

a.insert(3,20)

print(a)

#remove()

a.remove(7)

print(a)

#append()

a.append("hi")

print(a)

c=len(a)

print(c)

#pop()

a.pop()

print(a)

a.pop(6)

print(a)

# clear()

a.clear()

print(a)
```

Output:

[1, 3, 5, 6, 7, 4, 'hello']

[1, 3, 5, 20, 6, 7, 4, 'hello']

[1, 3, 5, 20, 6, 4, 'hello']

[1, 3, 5, 20, 6, 4, 'hello', 'hi']

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[1, 3, 5, 20, 6, 4, 'hello']

[1, 3, 5, 20, 6, 4]

[]

3. Create a tuple and perform the following methods.

a) Add items b) len( ) c) Check for item in tuple d) Access items

#creating a tuple

rainbow=("v","i","b","g","y","o","r")

print(rainbow)

colour=("violet","blue","green","yellow","orange","red")

 print(colour)

 # Add items in tuples

rainbow_colour=rainbow+colour print(rainbow_colour)

#length of the tuple

c=len(rainbow_colour)

print(c)

#Access items in tuple

print("rainbow[2]:",rainbow[2])

print("rainbow[1:3]",rainbow[1:3])

print("rainbow[0:4]",rainbow[0:4])

Output:

('v', 'i', 'b', 'g', 'y', 'o', 'r')

('violet', 'blue', 'green', 'yellow', 'orange', 'red')

('v', 'i', 'b', 'g', 'y', 'o', 'r', 'violet', 'blue', 'green', 'yellow', 'orange', 'red')

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rainbow[2]: b

rainbow[1:3] ('i', 'b')

rainbow[0:4] ('v', 'i', 'b', 'g')

4. Create a dictionary and apply the following methods.

1. Print the dictionary items 2. Access items 3. Use get( ) 4. Change Values 5. Use len( )

 # creating a dictionary

college={'name': "QIS", 'code': "INDIA",'pincode': 560050 }

print(college)

#adding items to dictionary

college["location"] = "IBP"

print(college)

#changing values of a key

college["location"] = "vijayawada"

print(college)

#know the length using len()

print("length of college is:",len(college))

#Acess items

print("college['name']:",college['name'])

 # use get ()

x=college.get('pincode')

print(x)

#to copy the same dictionary use copy()

mycollege= college.copy()

print(mycollege)

Output:

{'name': 'QIS', 'code': 'INDIA', 'pincode': 560050}

{'name': 'QIS', 'code': 'INDIA', 'pincode': 560050, 'location': 'IBP'}

{'name': 'QIS', 'code': 'INDIA', 'pincode': 560050, 'location': 'vijayawada'}

length of college is: 4

college['name']: QIS

560050

{'name': 'QIS', 'code': 'INDIA', 'pincode': 560050, 'location': 'vijayawada'}

5. Write a program to create a menu with the following options

1. TO PERFORM ADDITITON 2. TO PERFORM SUBTRACTION 3. TO PERFORM MULTIPICATION 4. TO PERFORM DIVISION

Accepts users input and perform the operation accordingly. Use functions with arguments.

```python
def add(n1,n2):
        return n1+n2
def sub(n1,n2):
        return n1-n2
def mul(n1,n2):
        return n1*n2
def div(n1,n2):
        return n1/n2
print("Welcome to the Arithmetic Program")
choice =1
while(choice!=0):
        x = int(input(" Enter the first number\n"))
        y = int(input(" Enter the second number\n"))
        print("1. TO PERFORM ADDITION")
        print("2. TO PERFORM SUBTRACTION")
        print("3. TO PERFORM MULTIPLICATION")
```

```python
print("4. TO PERFORM DIVISION")
print("0. To Exit")
choice = int(input("Enter your choice"))
if choice == 1:
        print(x, "+" ,y ,"=" ,add(x,y))
elif choice == 2:
        print(x, "-" ,y ,"=" ,sub(x,y))
elif choice == 3:
        print(x, "*" ,y ,"=" ,mul(x,y))
elif choice == 4:
        print(x, "%" ,y ,"=" ,div(x,y))
elif choice ==0:
        print("Exit")
else:
        print("Invalid Choice");
```

Output:

Welcome to the Arithmetic Program

Enter the first number

45

Enter the second number

56

1. TO PERFORM ADDITION

2. TO PERFORM SUBTRACTION

3. TO PERFORM MULTIPLICATION

4. TO PERFORM DIVISION

0. To Exit

Enter your choice

1

45 + 56 = 101

Enter the first number

23

 Enter the second number

12

1. TO PERFORM ADDITION

2. TO PERFORM SUBTRACTION

3. TO PERFORM MULTIPLICATION

4. TO PERFORM DIVISION

0. To Exit

Enter your choice

2

23 - 12 = 11

Enter the first number

2

 Enter the second number

45

1. TO PERFORM ADDITION

2. TO PERFORM SUBTRACTION

3. TO PERFORM MULTIPLICATION

4. TO PERFORM DIVISION

0. To Exit

Enter your choice

3

2 * 45 = 90

Enter the first number

34

Enter the second number

2

1. TO PERFORM ADDITION

2. TO PERFORM SUBTRACTION

3. TO PERFORM MULTIPLICATION

4. TO PERFORM DIVISION

0. To Exit

Enter your choice

4

34 % 2 = 17.0

Enter the first number

2

Enter the second number

3

1. TO PERFORM ADDITION

2. TO PERFORM SUBTRACTION

3. TO PERFORM MULTIPLICATION

4. TO PERFORM DIVISION

0. To Exit

Enter your choice

0

Exit

6.Write a Program to print a number is Positive / Negative using if-else

```python
print("Program to print a number is Positive / Negative")
choice =1
while(choice!=0):
    number=int(input("Enter a Number"))
        if number >0:
            print("The Number",number,"is Positive")
        else:
            print("The Number",number, "is negative")
        choice=int(input("Do you wish to continue 1/0"))
```

Output:

Program to print a number is Positive / Negative

Enter a Number 67

The Number 67 is Positive

Do you wish to continue 1/0

1

 Enter a Number -90

The Number -90 is negative

Do you wish to continue 1/0

0

7.Write a program for filter() to filter only even numbers form a given file.

```
def even(x):
    return x % 2 != 0
a=[1,2,3,4,5,6,7,8,9,10,11,12,13,15]
result = filter(even,a)
print("Original List:",a)
print("Filtered List:",list(result))
```

Output:

Filtered list: [2,4,6,8,10,12]

8.Write a python program to print date, time for today and now

import datetime

a=datetime.datetime.today()

b=datetime.datetime.now()

print(a)

print(b)

Output:

2022-11-30 17:18:52.879383

2022-11-30 17:18:52.879382

9. Write a program to add some days to your present date and print the date added.

```
from datetime import datetime

from datetime import timedelta

from datetime import date

Begindatestring = date.today()

print("Beginning date")

print(Begindate)

Enddate= Begindatestring + timedelta(days=10)

print("Ending date")

print(Enddate)
```

Output:

Beginning date

2022-12-05

Ending date

2022-12-15

10. Write a program to convert the number of characters in the string and store them in a dictionary data structure.

```
def construct_character_dict(words):
    character_count_dict=dict()
    for each_character in word:
        character_count_dict[each_character]=character_count_digit.get(each_character,0)+1
        sorted_list_keys=sorted(character_count_dict.keys())
    for each_key in sorted_list_keys:
        print(each_key,character_count_dict.get(each_key))

def main():
    word=input("Enter a string: ")
    construct_character_dict(word)
if__name__=="__main__":
    main()
```

Enter a string: BMSCCM

B 1

M 2

S 1

C 2

11. Write a program to count frequency of characters in a given file.

(Note: File name in this program is <u>sample.txt</u> replace it with the actual text file name)

```
def frequency_letter(fileName , letter):
    file=open(fileName,'r')
    text=file.read()
    return text.count(letter)
print("Frequency of the character e is: ")
print(frequency_letter('sample.txt',e'))
```

<u>Output:</u>

Frequency of character e is:

4

12. Using a numpy module create an array and check the following

1.Type of array 2.Axis of the array 3. Shape of array 4.Type of element in array

```
import numpy as np
arr=np.array([[1,2,3],[4,2,5]])
print("Array is of type:",type(arr))
print("Number of dimensions:",arr.ndim)
print("shape of array:",arr.shape)
print("Size of array:",arr.size)
print("Array stores elements of type:",arr.dtype)
```

Output:

Array is of type :<class 'numpy.ndarray')

Number of dimensions : 2

Shape of array : (2,3)

Size of the array : 6

Array stores elements of type : int64

13. Write a python program to concatenate the dataframes with two different objects

```python
import pandas as pd

df1=pd.DataFrame({'id':['A01','A02','A03','A04'],'Name':['SREE','NAGGI','KOWSHI','SATHWIKA']})

print("Data Frame 1: ")

print(df1)

df2=pd.DataFrame({'id':['B04','B05','B06','B07'],'Name':['SADHANA','SAHANA','DISHA','VRINDA']})

print("Data Frame 2: ")

print(df2)

frames=[df1,df2]

result=pd.concat(frames)

print("Concatenated Data Frame")

print(result)
```

Output:

Data frame 1:

id		Name
0	A01	SREE
1	A02	NAGGI
2	A03	KOWSHI
3	A04	SATHWIKA

Data frame 2 :

id		Name
0	B04	SADHANA
1	B05	SAHANA
2	B06	DISHA
3	B07	VRINDHA

Concatenated Data frame

id		Name
0	A01	SREE
1	A02	NAGGI
2	A03	KOWSHI
3	A04	SATHWIKA
0	B04	SADHANA
1	B05	SAHANA
2	B06	DISHA
3	B07	VRINDHA

14. Write a python code to read a csv file using panda module & print the first and last. (Note: The csv file name in the program is 14.csv)

```python
import pandas as pd

df=pd.read_csv("14.csv")

print("First 5 Rows")

print(df.head(5))

print("\n Last 5 Rows:")

print(df.tail(5))
```

Output:

```
First 5 Rows
     Color    HTML / CSS Hex Code          Decimal Code
0      NaN     Color Name   #RRGGBB                (R,G,B)
1      NaN   lightsalmon   #FFA07A   rgb(255,160,122)
2      NaN        salmon   #FA8072   rgb(250,128,114)
3      NaN    darksalmon   #E9967A   rgb(233,150,122)
4      NaN    lightcoral   #F08080   rgb(240,128,128)

Last 5 Rows
      Color       HTML / CSS Hex Code          Decimal Code
19      NaN         peachpuff   #FFDAB9   rgb(255,218,185)
20      NaN   palegoldenrod   #EEE8AA   rgb(238,232,170)
21      NaN             khaki   #F0E68C   rgb(240,230,140)
22      NaN       darkkhaki   #BDB76B   rgb(189,183,107)
23      NaN           yellow   #FFFF00     rgb(255,255,0)
>>>
```

15. Write a python program which accepts the radius of a circle from user and computes the area (use math module)

import math as M

radius = float (input("Enter the radius: "))

area_of_circle= M.Pi*radius*radius

circumference_of_circle= 2*M.Pi*radius

print("The area of circle is :", area_of_circle)

print("The circumference of circle is :",circumference_if_circle)

Output:

Enter the radius: 45

The area of the circle is :6361.725123519332

The circumference of the circle is :282.7433388230814

16 a. Get total units of all months and show line plot with the following style properties.

- **Generated line plot must include following Style Properties.**
- **Line Style dotted and Line - color should be blue**
- **Show legend at the lower right location**
- **X label = Months**
- **Y label = Sold Units**
- **Line width should be 4**

```
import pandas as pd

import matplotlib.pyplot as plt

df=pd.read_csv("16pgm1.csv")

sold_units=df["Total Units"]

plt.plot(sold_units, color='blue',marker = 'o',linestyle='dotted',label='Sold Units',linewidth=4)

plt.xlabel("Months")

plt.ylabel("Sold Units")

plt.title("Sales Trend of All products")

plt.legend(loc="lower right")

plt.xticks(range(len(df)),df['Months'],rotation=45)

plt.show()
```
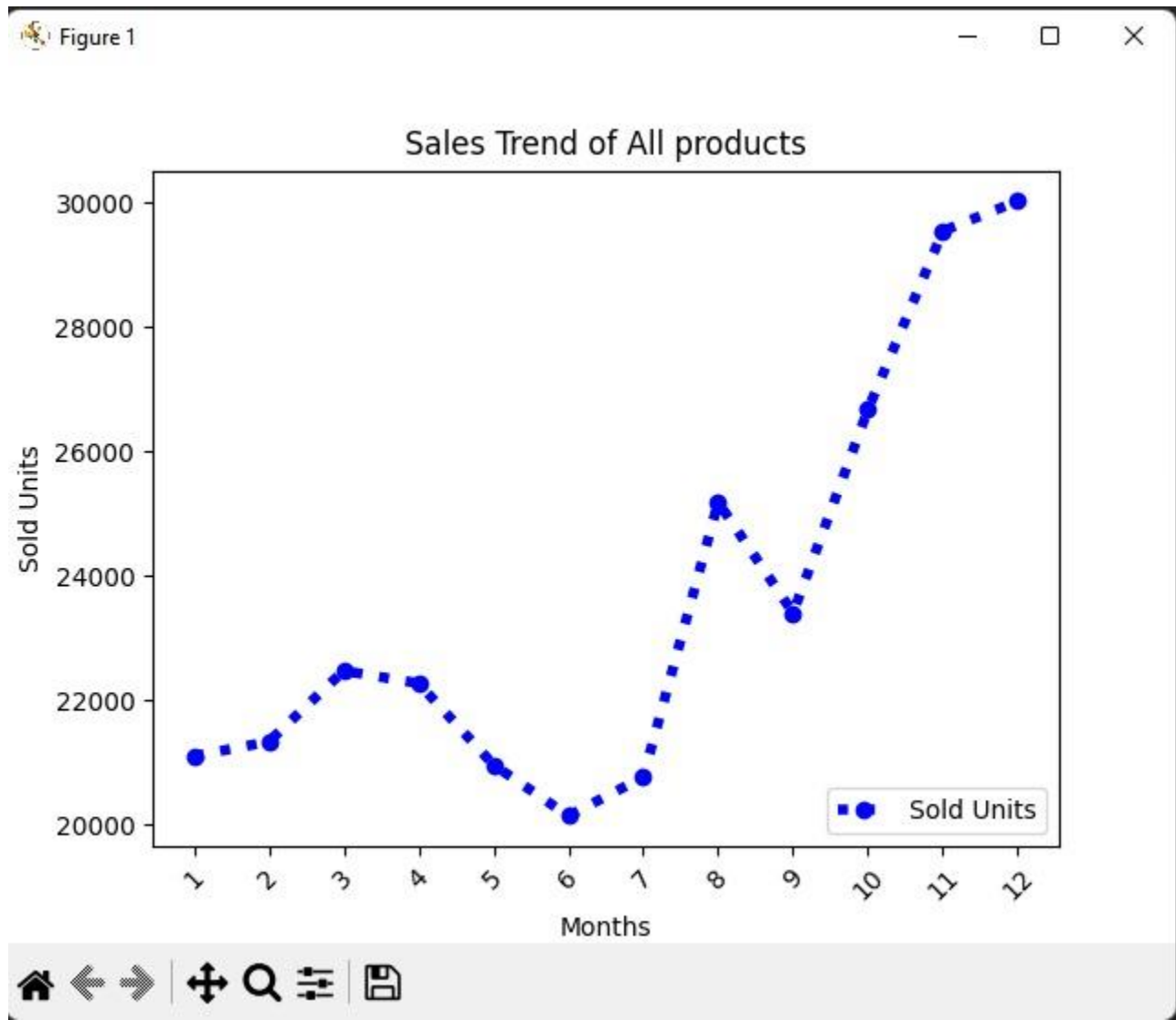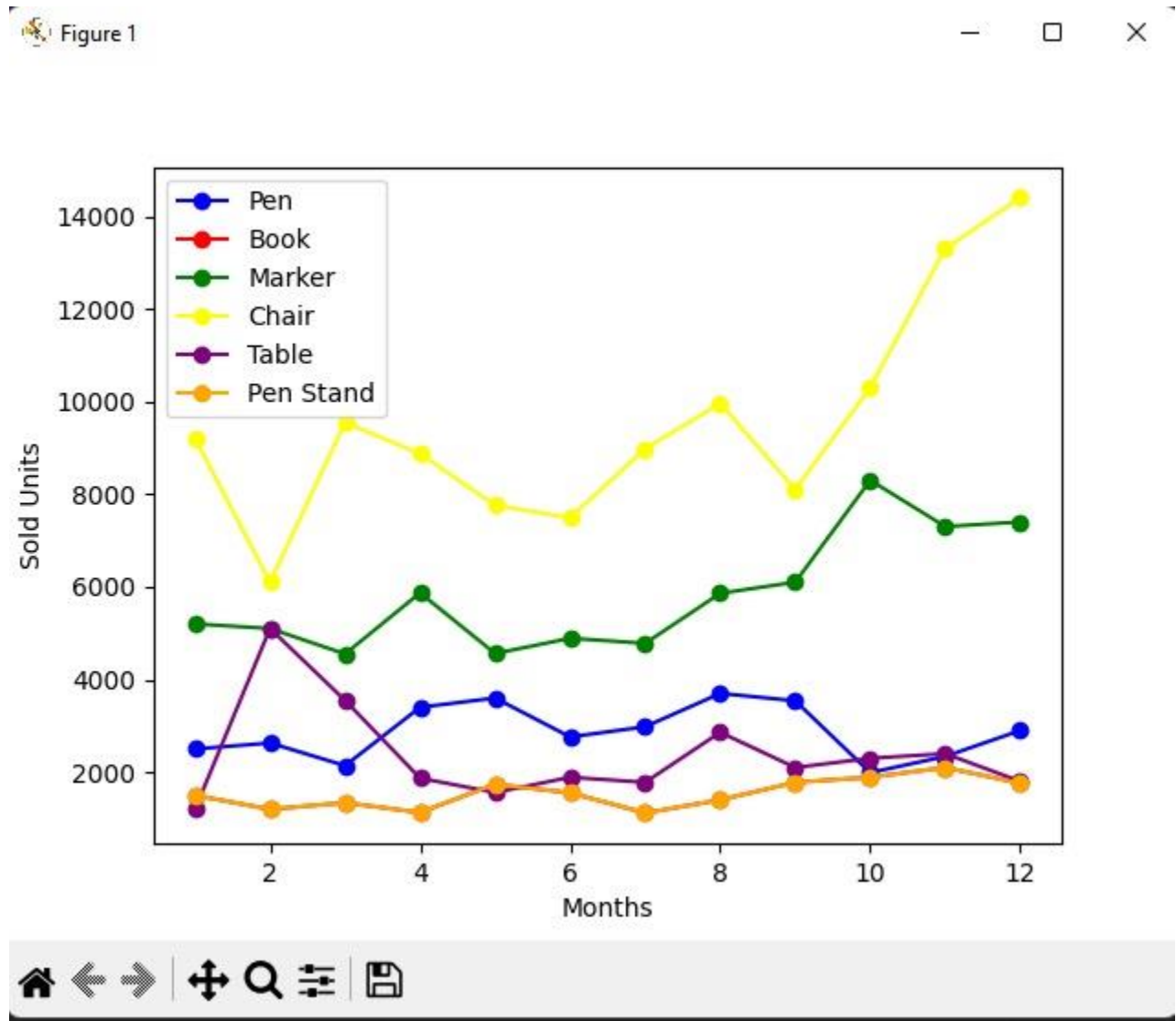
16.a Output:

16b. Display the number of units sold per month for each product using multiline plots. (i,e. Separate Plotline for each product)

```python
import pandas as pd

import matplotlib.pyplot as plt

df=pd.read_csv("16pgm1.csv")

plt.plot(df["Months"],df["Pen"], color='blue',marker='o',label="Pen")

plt.plot(df["Months"],df["Book"], color='red',marker='o',label="Book")

plt.plot(df["Months"],df["Marker"], color='green',marker='o',label="Marker")

plt.plot(df["Months"],df["Chair"], color='yellow',marker='o',label="Chair")

plt.plot(df["Months"],df["Table"], color='purple',marker='o',label="Table")

plt.plot(df["Months"],df["Pen Stand"], color='orange',marker='o',label="Pen Stand")

plt.xlabel("Months")

plt.ylabel("Sold Units")

plt.legend(loc="upper left")

plt.show()
```

16.b Output:

16C. Read Chair and table product sales data and show it using the bar chart.

- **The bar chart should display the number of units sold per month for each product. Add a separate bar for each product in the same chart.**

```python
import pandas as pd

import matplotlib.pyplot as plt

df=pd.read_csv("16pgm1.csv")

data=df[["Months","Chair","Table"]]

bar_width=0.35

chair_bar=plt.bar(data.index,data['Chair'],bar_width, color='blue',label='Chair')

table_bar=plt.bar(data.index + bar_width,data['Table'], color='red',label='Table')

plt.xlabel("Months")

plt.ylabel("Solid Units")

plt.title("Sales Trend of Chair and Table")

plt.legend(loc="upper left")

plt.xticks(data.index + bar_width/2, data['Months'])

plt.show()
```

16.c Output:
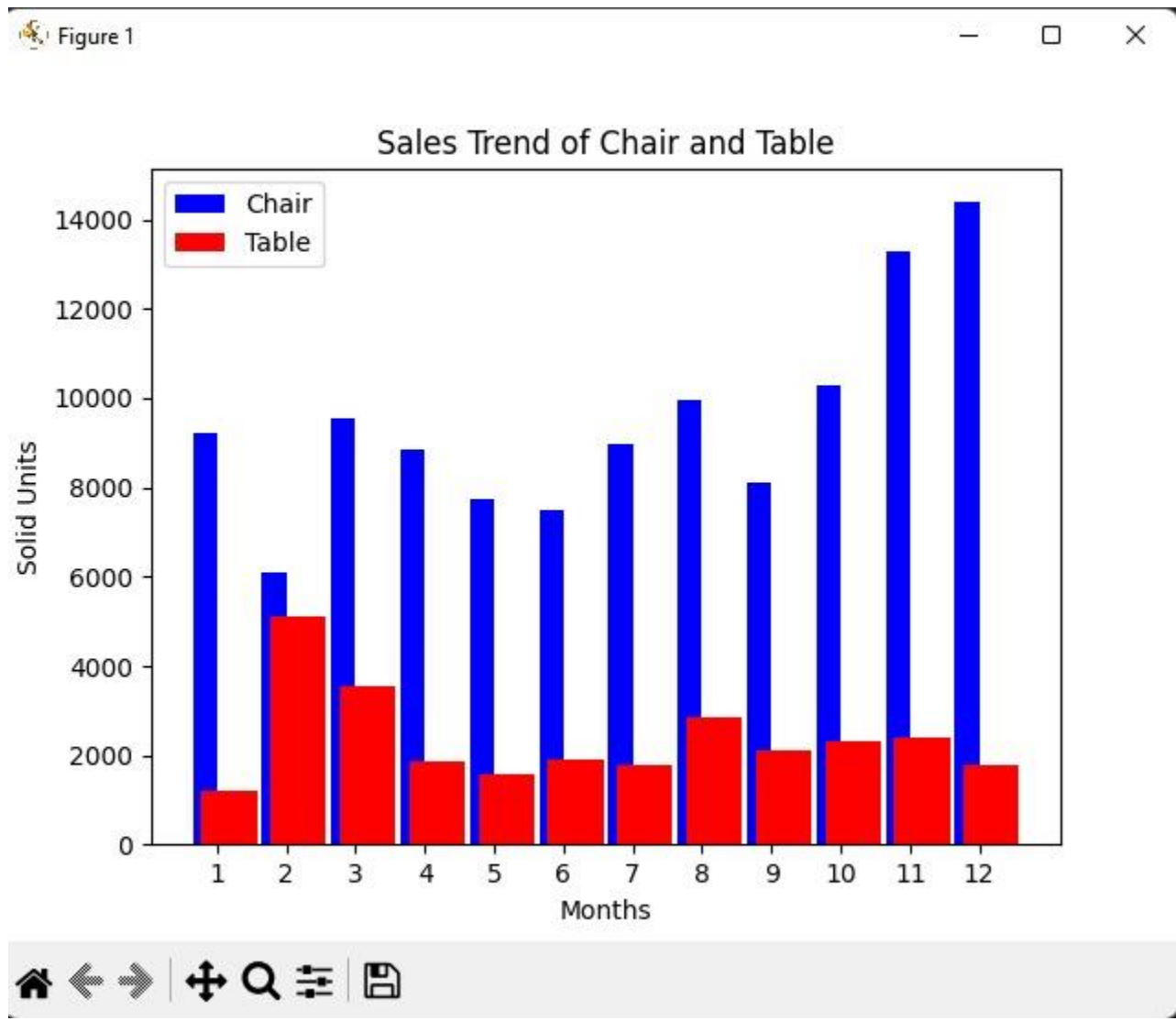
16D. Read all product sales data and show it using the stack plot

```python
import pandas as pd

import matplotlib.pyplot as plt

df=pd.read_csv("16pgm1.csv")

data=df[["Months","Pen","Book","Marker","Chair","Table","Pen Stand"]]

plt.stackplot(data["Months"],data["Pen"],data["Book"],data["Marker"],data["Chair"],data["Table"],data["PenStand"],labels=["Pen","Book","Marker","Chair","Table","Pen Stand"])

plt.xlabel("Months")

plt.ylabel("Sold Units")

plt.legend(loc="upper left")

plt.title("Sales Trend of All Products")

plt.show()
```

16.d Output:
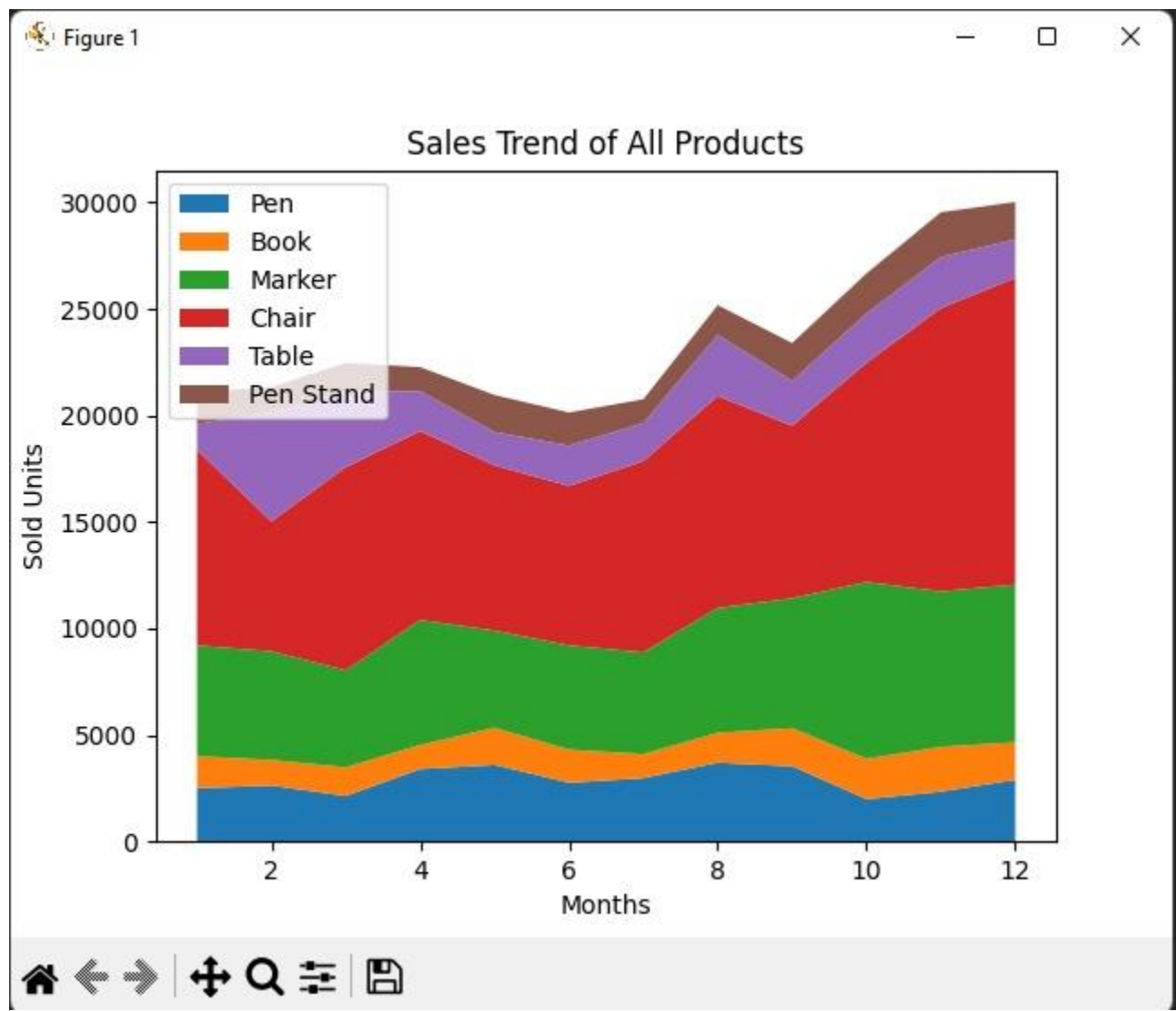
Pickle Program Example

```python
import pickle

def storeData():
    Sreeni={'key':'Sreeni','Name':'Sreeni Rao','age':21,'pay':40000}
    Ravi={'key':'Ravi','Name':'Ravi Shankar','age':21,'pay':25000}
    db={}
    db['Sreeni']=Sreeni
    db['Ravi']=Ravi
    dbfile=open('examplePickle','ab')
    pickle.dump(db,dbfile)
    dbfile.close()

def loadData():
    dbfile=open('examplePickle','rb')
    db=pickle.load(dbfile) for keys in db:
        print(keys,'=>',db[keys])
    dbfile.close()

if __name__ == '__main__':
storeData()
loadData()
```