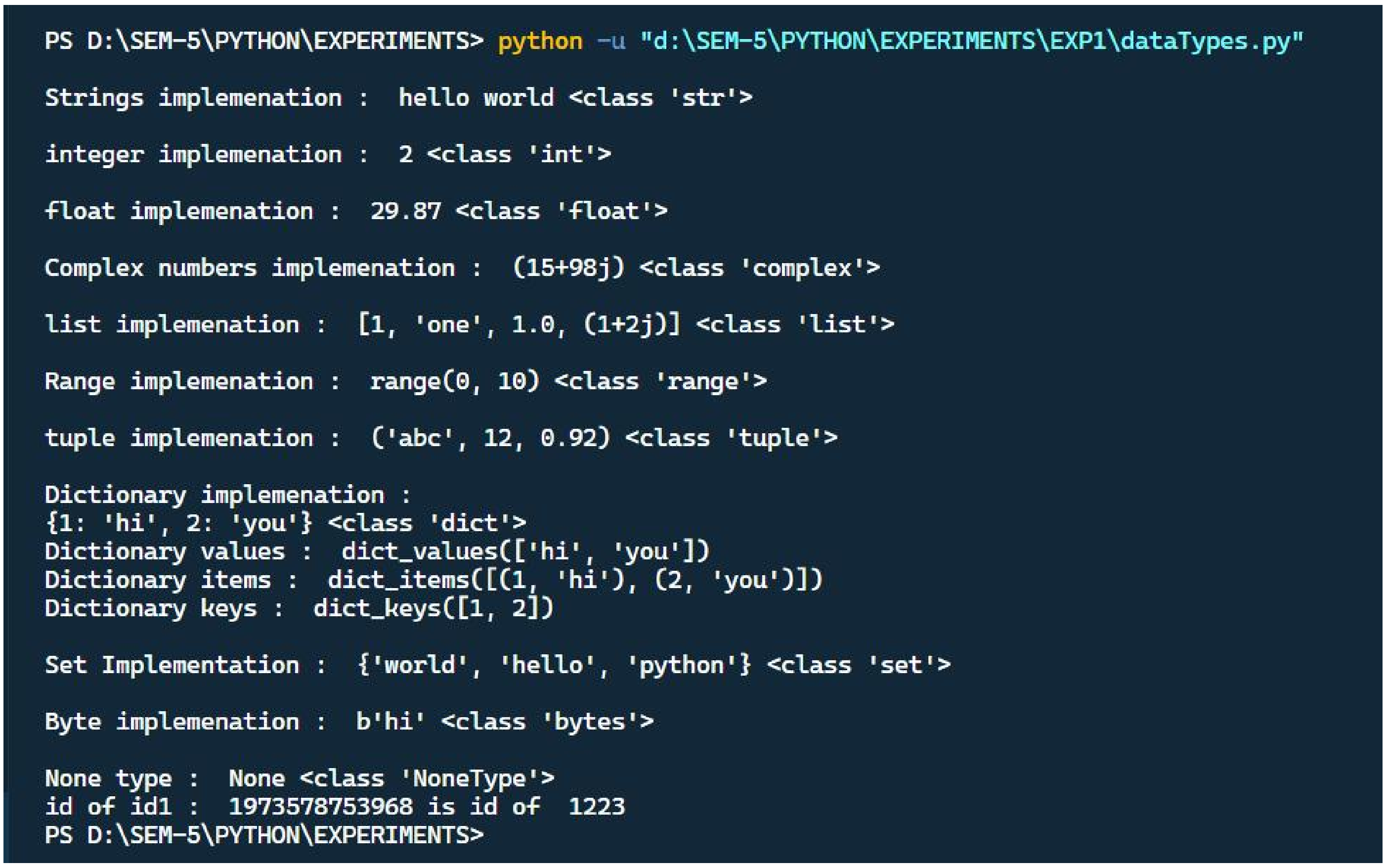
Code (Experiment1) :

1) Data Types in Python :

```
a = "hello world"

print('\nStrings implemenation : ',a,type(a))


b = 2

print('\ninteger implemenation : ',b,type(b))


c = 29.87

print('\nfloat implemenation : ',c,type(c))


com = 15+98j

print('\nComplex numbers implemenation : ',com,type(com))


l = [1,'one',1.00,1+2j]

print('\nlist implemenation : ',l,type(l))


ran = range(10)

print('\nRange implemenation : ',ran,type(ran))


tup = ('abc',12,0.92)

print('\ntuple implemenation : ',tup,type(tup))


dic = {1:'hi',2:'you'}

print('\nDictionary implemenation : ')

print(dic,type(dic))

print('Dictionary values : ',dic.values())

print('Dictionary items : ',dic.items())

print('Dictionary keys : ',dic.keys())


s = {'hello','world','python'}

print('\nSet Implementation : ',s,type(s))


by = b'hi'

print('\nByte implemenation : ',by,type(by))


n = None

print('\nNone type : ',n,type(n))
```

```python
id1 = 1223

print('id of id1 : ',id(id1),'is id of ',id1)
```

Output for above code :



```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP1\dataTypes.py"

Strings implemenation :  hello world <class 'str'>

integer implemenation :  2 <class 'int'>

float implemenation :  29.87 <class 'float'>

Complex numbers implemenation :  (15+98j) <class 'complex'>

list implemenation :  [1, 'one', 1.0, (1+2j)] <class 'list'>

Range implemenation :  range(0, 10) <class 'range'>

tuple implemenation :  ('abc', 12, 0.92) <class 'tuple'>

Dictionary implemenation :
{1: 'hi', 2: 'you'} <class 'dict'>
Dictionary values :  dict_values(['hi', 'you'])
Dictionary items :  dict_items([(1, 'hi'), (2, 'you')])
Dictionary keys :  dict_keys([1, 2])

Set Implementation :  {'world', 'hello', 'python'} <class 'set'>

Byte implemenation :  b'hi' <class 'bytes'>

None type :  None <class 'NoneType'>
id of id1 :  1973578753968 is id of  1223
PS D:\SEM-5\PYTHON\EXPERIMENTS>
```

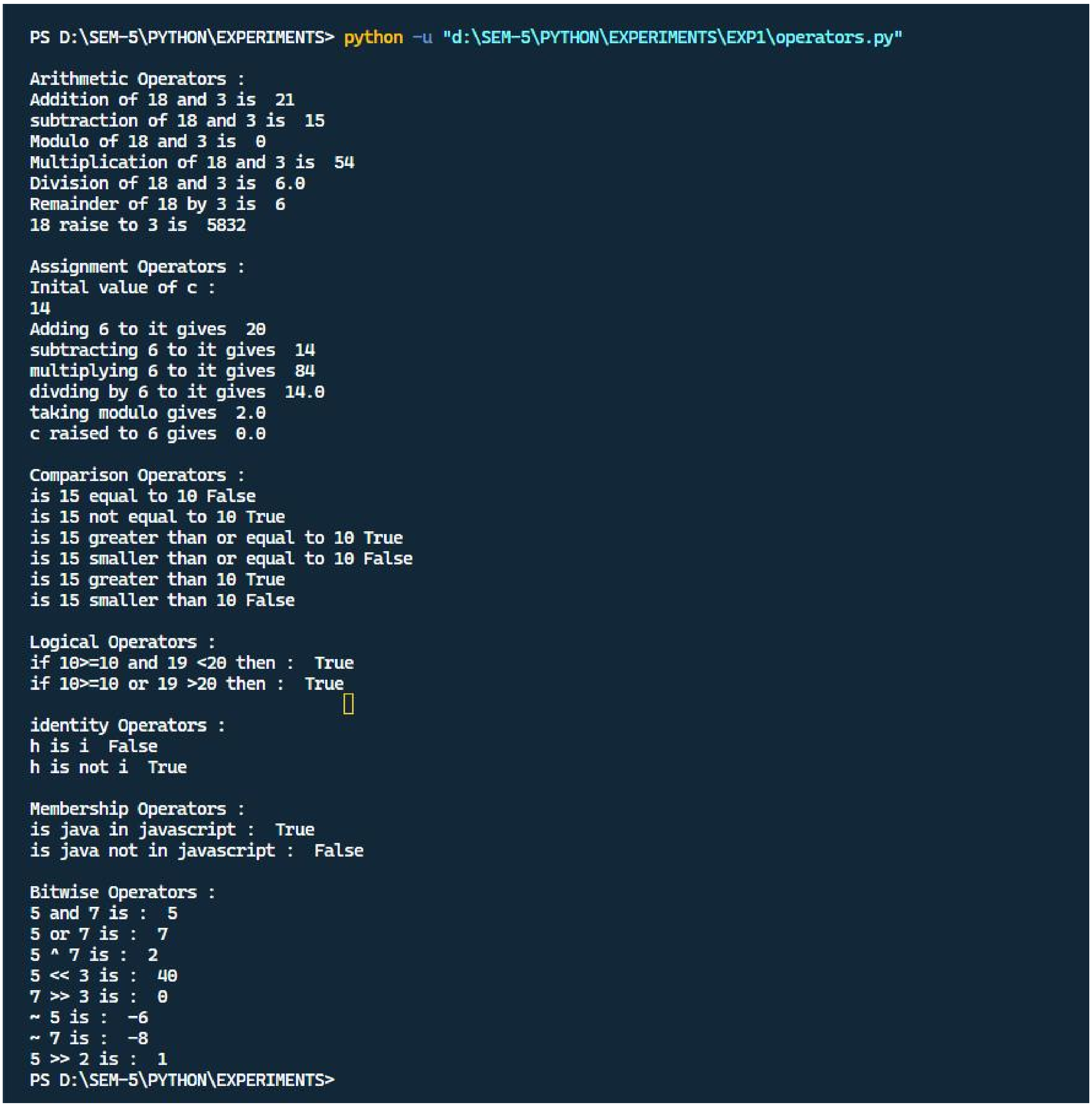
2) Operators in Python :

```python
a = 18

b = 3
```

```
print("\nArithmetic Operators :")

print(f'Addition of {a} and {b} is ',a+b)

print(f'subtraction of {a} and {b} is ',a-b)

print(f'Modulo of {a} and {b} is ',a%b)

print(f'Multiplication of {a} and {b} is ',a*b)

print(f'Division of {a} and {b} is ',a/b)

print(f'Remainder of {a} by {b} is ',a//b)

print(f'{a} raise to {b} is ',a**b)


c = 14

print("\nAssignment Operators :")

print("Inital value of c :")

print(c)

c+=6

print("Adding 6 to it gives ",c)

c-=6

print("subtracting 6 to it gives ",c)

c*=6

print("multiplying 6 to it gives ",c)

c/=6

print("divding by 6 to it gives ",c)

c%=6

print("taking modulo gives ",c)

c//=6

print("c raised to 6 gives ",c)

c**=6


d = 15

e = 10

print('\nComparison Operators :')

print(f"is {d} equal to {e}",d==e)

print(f"is {d} not equal to {e}",d!=e)

print(f"is {d} greater than or equal to {e}",d>=e)

print(f"is {d} smaller than or equal to {e}",d<=e)

print(f"is {d} greater than {e}",d>e)

print(f"is {d} smaller than {e}",d<e)


f = 10

g = 19

print('\nLogical Operators :')
```

```python
print(f"if {f}>=10 and {g} <20 then : ", f>=10 and g<20)

print(f"if {f}>=10 or {g} >20 then : ", f>=10 or g>20)


h = 9

i = 19

print('\nidentity Operators :')

print(f"h is i ", h is i)

print(f"h is not i ", h is not i)


x = 'java'

y = 'javascript'

print("\nMembership Operators : ")

print(f'is {x} in {y} : ',x in y)

print(f'is {x} not in {y} : ',x not in y)


a = 5

b = 7

print("\nBitwise Operators : ")

print(f"{a} and {b} is : ",a&b)

print(f"{a} or {b} is : ",a|b)

print(f"{a} ^ {b} is : ",a^b)

print(f"{a} << 3 is : ",a<<3)

print(f"{b} >> 3 is : ",b>>3)

print(f"~ {a} is : ",~a)

print(f"~ {b} is : ",~b)

print(f"{a} >> 2 is : ",b>>2)
```

Output for above code :



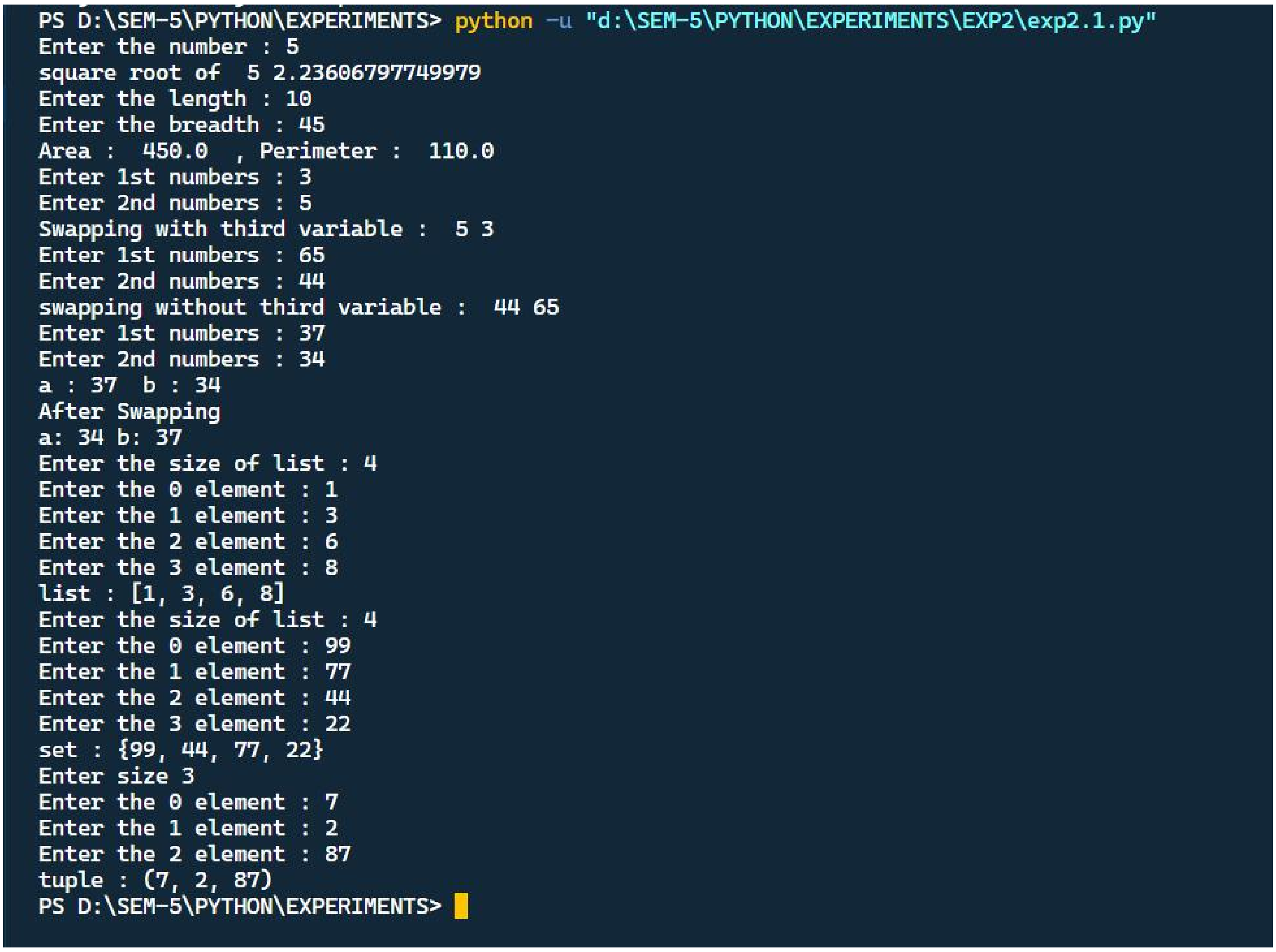
```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP1\operators.py"

Arithmetic Operators :
Addition of 18 and 3 is  21
subtraction of 18 and 3 is  15
Modulo of 18 and 3 is  0
Multiplication of 18 and 3 is  54
Division of 18 and 3 is  6.0
Remainder of 18 by 3 is  6
18 raise to 3 is  5832

Assignment Operators :
Inital value of c :
14
Adding 6 to it gives  20
subtracting 6 to it gives  14
multiplying 6 to it gives  84
divding by 6 to it gives  14.0
taking modulo gives  2.0
c raised to 6 gives  0.0

Comparison Operators :
is 15 equal to 10 False
is 15 not equal to 10 True
is 15 greater than or equal to 10 True
is 15 smaller than or equal to 10 False
is 15 greater than 10 True
is 15 smaller than 10 False

Logical Operators :
if 10>=10 and 19 <20 then :  True
if 10>=10 or 19 >20 then :  True

identity Operators :
h is i  False
h is not i  True

Membership Operators :
is java in javascript :  True
is java not in javascript :  False

Bitwise Operators :
5 and 7 is :  5
5 or 7 is :  7
5 ^ 7 is :  2
5 << 3 is :  40
7 >> 3 is :  0
~ 5 is :  -6
~ 7 is :  -8
5 >> 2 is :  1
PS D:\SEM-5\PYTHON\EXPERIMENTS>
```

Code (Experiment 2) :

```python
a = int(input("Enter the number : "))
print('square root of ', a, a**0.5)
l, b = float(input("Enter the length : ")), float(input("Enter the breadth : "))
print("Area : ", l*b, " ,", "Perimeter : ", 2 * (l + b))
a,b = int(input("Enter 1st numbers : ")), int(input("Enter 2nd numbers : "))
c = a
a = b
b = c
print("Swapping with third variable : ",a,b)
a,b = int(input("Enter 1st numbers : ")), int(input("Enter 2nd numbers : "))
b,a = a,b
print("swapping without third variable : ", a,b)
# another way
a,b = int(input("Enter 1st numbers : ")), int(input("Enter 2nd numbers : "))
print("a :",a," b :",b)
a = a+b
b = a-b
a = a-b
print("After Swapping ")
print("a:",a,"b:",b)
# adding elements to list , set , tuples
n = int(input("Enter the size of list : "))
l = list()
for i in range(n):
    l.append(int(input(f"Enter the {i} element : ")))
print("list :",l)
n = int(input("Enter the size of list : "))
s = set()
for i in range(n):
    s.add(int(input(f"Enter the {i} element : ")))
print("set :", s)
n = int(input("Enter size "))
t = tuple()
l = list(t)
for i in range(n):
    l.append(int(input(f"Enter the {i} element : ")))
t = tuple(l)
```

```python
print("tuple :", t)
```

Output :

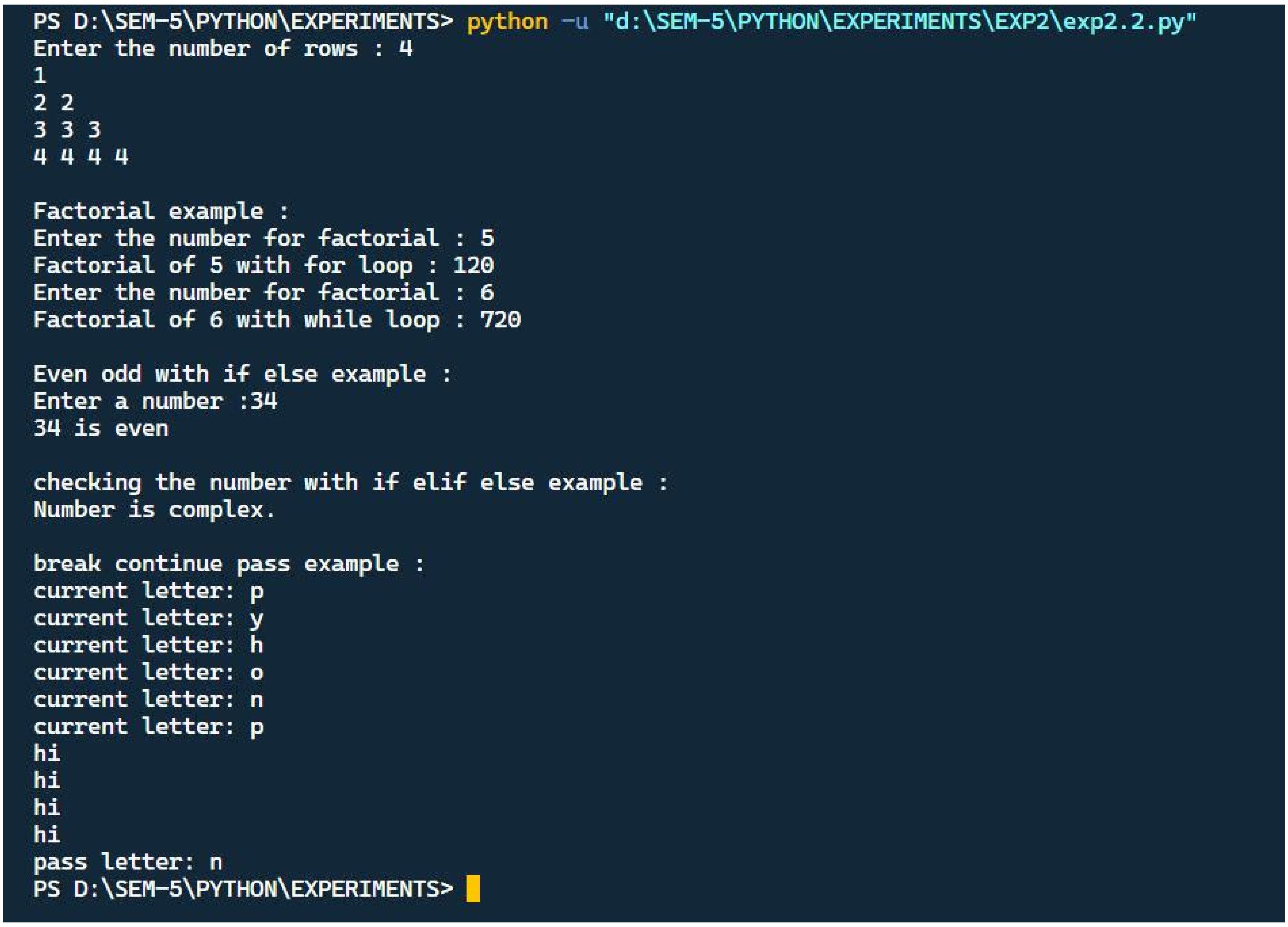


```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP2\exp2.1.py"
Enter the number : 5
square root of  5 2.23606797749979
Enter the length : 10
Enter the breadth : 45
Area :  450.0  , Perimeter :  110.0
Enter 1st numbers : 3
Enter 2nd numbers : 5
Swapping with third variable :  5 3
Enter 1st numbers : 65
Enter 2nd numbers : 44
swapping without third variable :  44 65
Enter 1st numbers : 37
Enter 2nd numbers : 34
a : 37  b : 34
After Swapping
a: 34 b: 37
Enter the size of list : 4
Enter the 0 element : 1
Enter the 1 element : 3
Enter the 2 element : 6
Enter the 3 element : 8
list : [1, 3, 6, 8]
Enter the size of list : 4
Enter the 0 element : 99
Enter the 1 element : 77
Enter the 2 element : 44
Enter the 3 element : 22
set : {99, 44, 77, 22}
Enter size 3
Enter the 0 element : 7
Enter the 1 element : 2
Enter the 2 element : 87
tuple : (7, 2, 87)
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

Code :

```
n = int(input("Enter the number of rows : " ))

for i in range(1,n+1):

    for j in range(1,i+1):

        print(i, end=" ")

    print()


# factorial

print("\nFactorial example : ")

n = int(input("Enter the number for factorial : "))

fact = 1

if n<0 : print("factorial does not exist !!")

elif n==0: print("Factorial of 0 is 1 ")

else :

    for i in range(1,n+1):

        fact *= i

print(f"Factorial of {n} with for loop : {fact}")

n = int(input("Enter the number for factorial : "))

fact = 1

i=1

if n<0 : print("factorial does not exist !!")

elif n==0: print("Factorial of 0 is 1 ")

else :

    while i <=n:

        fact *=i

        i+=1

print(f"Factorial of {n} with while loop : {fact}")


#Even odd with if else

print("\nEven odd with if else example : ")

n = int (input("Enter a number :"))

if (n%2)==0: print(f"{n} is even")

else: print(f"{n} is odd")


# checking the number

print("\nchecking the number with if elif else example : ")

number = 2+9j

if isinstance(number, int):
    print("Number is an integer.")
elif isinstance(number, list):
    print("Number is a list.")
elif isinstance(number, tuple):
    print("Number is a tuple.")
elif isinstance(number, set):
    print("Number is a set.")
elif isinstance(number, float):
    print("Number is a float data type.")
elif isinstance(number, str):
    print("Number is a string.")
else:
    print("Number is complex.")

# break continue pass
print("\nbreak continue pass example : ")
for letter in 'python':
    if letter == 't' or letter == '0':
        continue
    print('current letter:',letter)
for letter in 'python':
    if letter == 'y':
        break
    print('current letter:',letter)
for letter in 'python':
    if letter in ['p', 'y', 't', 'h']:
        print('hi')
        pass
print('pass letter:',letter)
```

Output for above code :



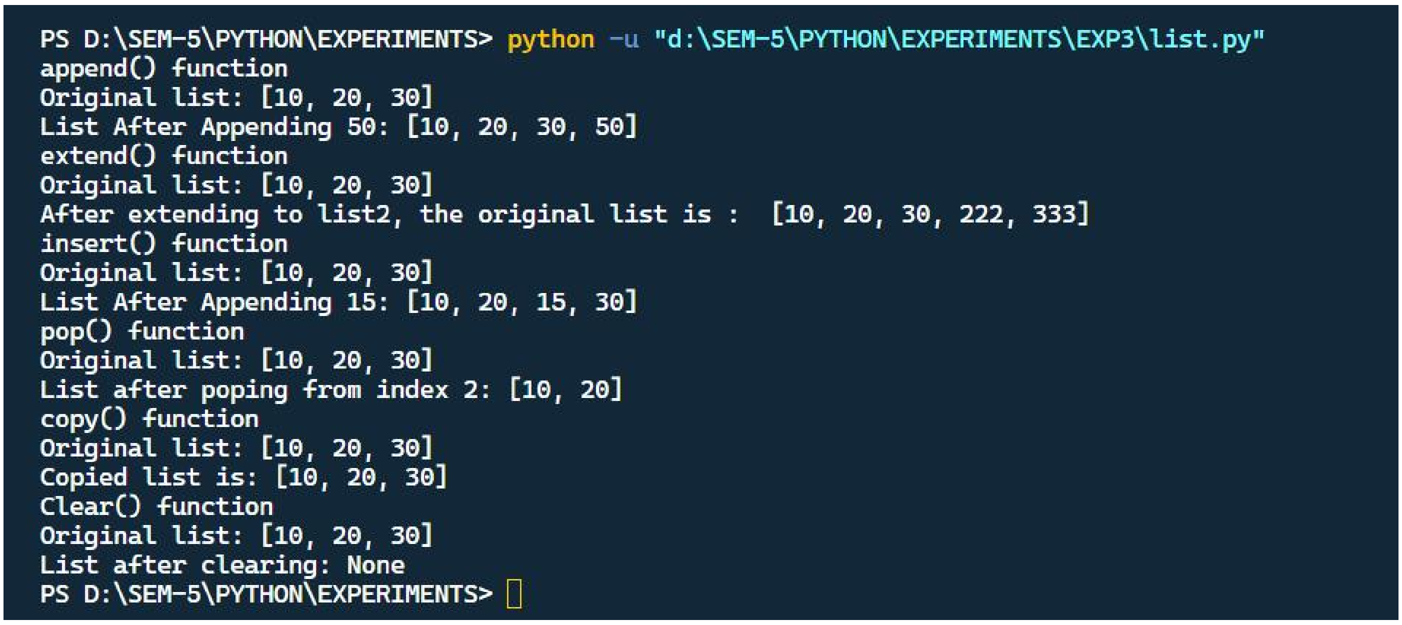
```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP2\exp2.2.py"
Enter the number of rows : 4
1
2 2
3 3 3
4 4 4 4

Factorial example :
Enter the number for factorial : 5
Factorial of 5 with for loop : 120
Enter the number for factorial : 6
Factorial of 6 with while loop : 720

Even odd with if else example :
Enter a number :34
34 is even

checking the number with if elif else example :
Number is complex.

break continue pass example :
current letter: p
current letter: y
current letter: h
current letter: o
current letter: n
current letter: p
hi
hi
hi
hi
pass letter: n
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

Code (Experiment 3):

List in built function :

```
# append()-appends element to list

print("append() function")

list1 = [10, 20, 30]

print("Original list:", list1)

list1.append(50)

print("List After Appending 50:", list1)

# extend()- extends by adding on with new list

print("extend() function")

list1 = [10, 20, 30]

print("Original list:", list1)

list2 = [222, 333]

list1.extend(list2)

print("After extending to list2, the original list is : ", list1)

# insert() - inserts element at particular location

print("insert() function")

list1 = [10, 20, 30]

print("Original list:", list1)

list1.insert(2, 15)

print("List After Appending 15:", list1)

# pop()- pops element from list

print("pop() function")

list1 = [10, 20, 30]

print("Original list:", list1)

list1.pop(2)

print("List after poping from index 2:", list1)

# copy()-copies a list

print("copy() function")

list1 = [10, 20, 30]

print("Original list:", list1)

list2 = list1.copy()

print("Copied list is:", list2)

# clear()-clears the list

print("Clear() function")

list1 = [10, 20, 30]

print("Original list:", list1)

list2 = list1.clear()

print("List after clearing:", list2)
```

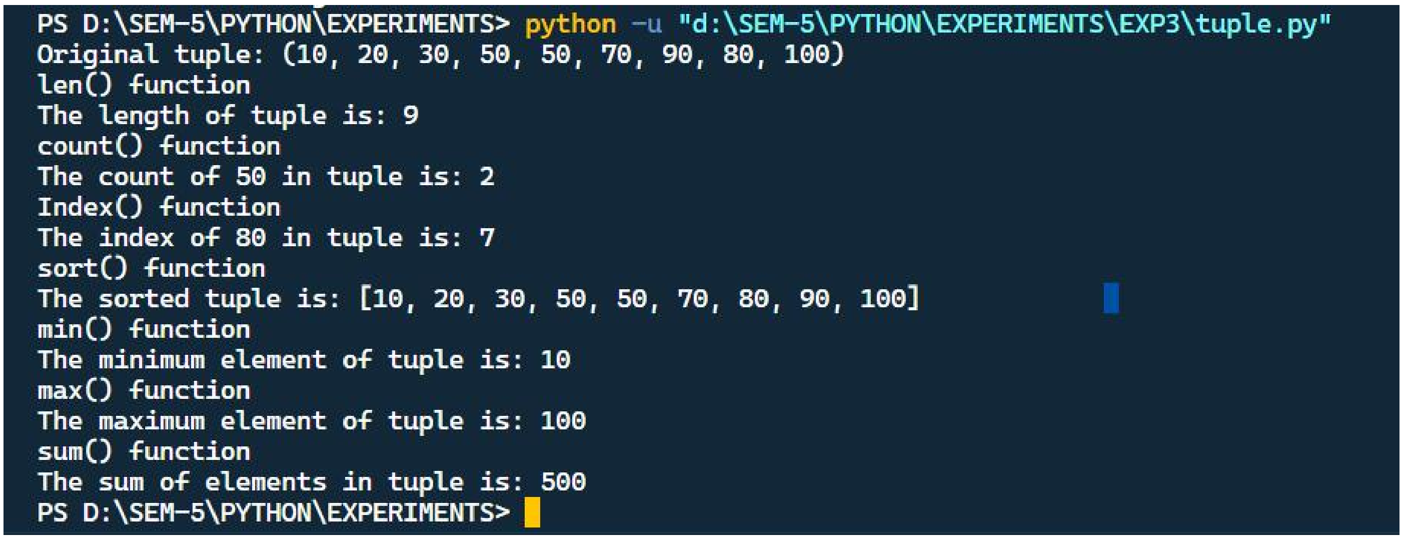
Output for above code :



```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP3\list.py"
append() function
Original list: [10, 20, 30]
List After Appending 50: [10, 20, 30, 50]
extend() function
Original list: [10, 20, 30]
After extending to list2, the original list is :  [10, 20, 30, 222, 333]
insert() function
Original list: [10, 20, 30]
List After Appending 15: [10, 20, 15, 30]
pop() function
Original list: [10, 20, 30]
List after poping from index 2: [10, 20]
copy() function
Original list: [10, 20, 30]
Copied list is: [10, 20, 30]
Clear() function
Original list: [10, 20, 30]
List after clearing: None
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

Tuple in built function :

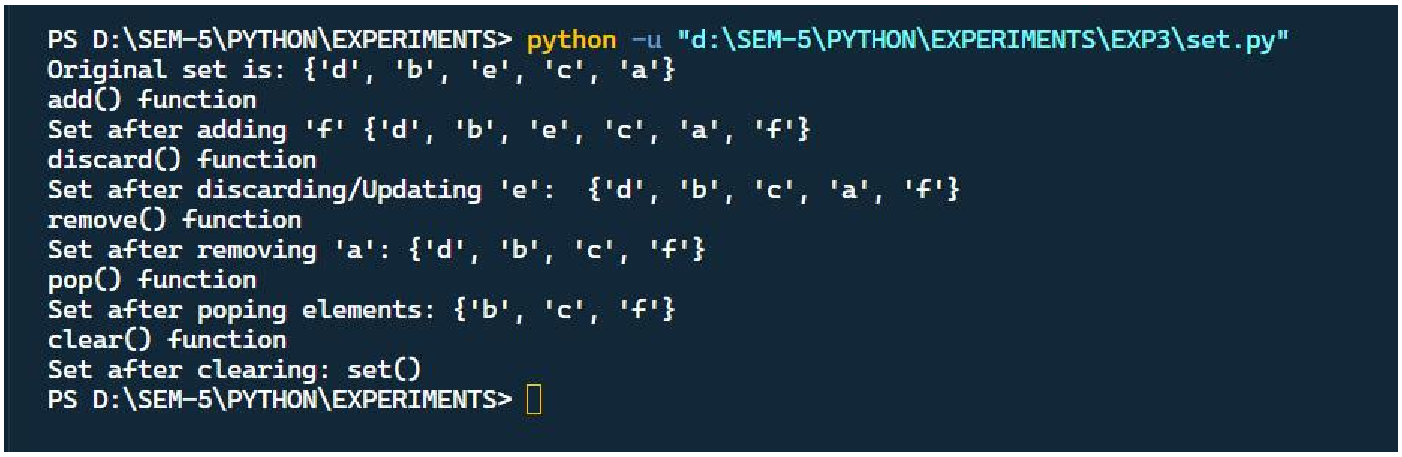
```python
tuple1 = (10, 20, 30, 50, 50, 70, 90, 80, 100)

print("Original tuple:", tuple1)

# len()- length of tuple

print("len() function")

print("The length of tuple is:", len(tuple1))

# count()-repetation of element in tuple

print("count() function")

print("The count of 50 in tuple is:", tuple1.count(50))

# index()- gives index of element in tuple

print("Index() function")

print("The index of 80 in tuple is:", tuple1.index(80))

# sort()-sorts the elements in tuple

print("sort() function")

print("The sorted tuple is:", sorted(tuple1))

# min()- gives minimum element of tuple

print("min() function")

print("The minimum element of tuple is:", min(tuple1))

# max()- gives maximum element of tuple

print("max() function")

print("The maximum element of tuple is:", max(tuple1))

# sum()-gives sum of elements in tuple

print("sum() function")
print("The sum of elements in tuple is:", sum(tuple1))
```



```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP3\tuple.py"
Original tuple: (10, 20, 30, 50, 50, 70, 90, 80, 100)
len() function
The length of tuple is: 9
count() function
The count of 50 in tuple is: 2
Index() function
The index of 80 in tuple is: 7
sort() function
The sorted tuple is: [10, 20, 30, 50, 50, 70, 80, 90, 100]
min() function
The minimum element of tuple is: 10
max() function
The maximum element of tuple is: 100
sum() function
The sum of elements in tuple is: 500
PS D:\SEM-5\PYTHON\EXPERIMENTS>
```

Sets in built function :

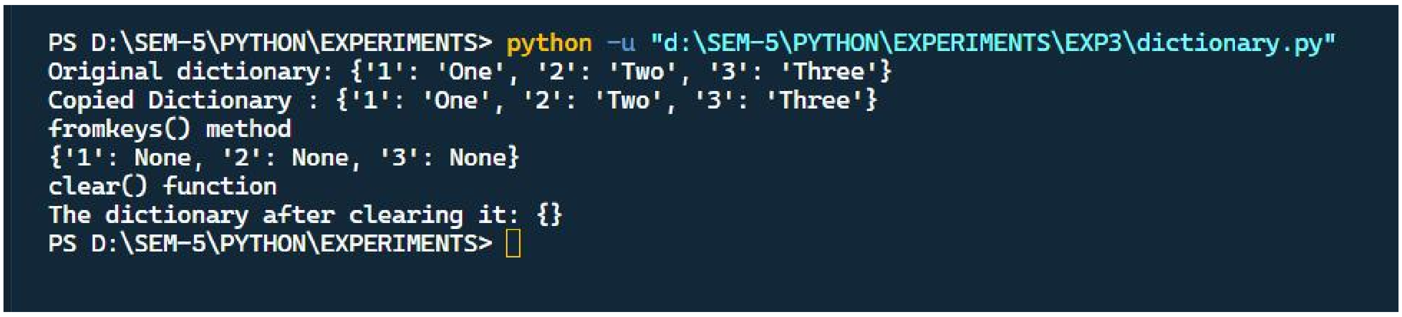
```python
set1 = {'a','b', 'c', 'd', 'e'}
print("Original set is:", set1)
# add()- adds element to set
set1.add('f')
print("add() function")
print("Set after adding 'f'", set1)
# discard() - discards element from set
set1.discard('e')
print("discard() function")
print("Set after discarding/Updating 'e': ",set1)
# remove() - removes element from set
set1.remove('a')
print("remove() function")
print("Set after removing 'a':", set1)
# pop()- pops element from the set
set1.pop()
print("pop() function")
print("Set after poping elements:", set1)

# clear()-clears the set
set1.clear()
print("clear() function")
print("Set after clearing:",set1)
```



```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP3\set.py"
Original set is: {'d', 'b', 'e', 'c', 'a'}
add() function
Set after adding 'f' {'d', 'b', 'e', 'c', 'a', 'f'}
discard() function
Set after discarding/Updating 'e':  {'d', 'b', 'c', 'a', 'f'}
remove() function
Set after removing 'a': {'d', 'b', 'c', 'f'}
pop() function
Set after poping elements: {'b', 'c', 'f'}
clear() function
Set after clearing: set()
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

Dictionary in built function :

```python
dict1 = {'1': 'One','2':'Two','3':'Three'}

print("Original dictionary:", dict1)

# copy()- copies the dictionary

dict2 = dict1.copy()

print("Copied Dictionary :",dict2)

# fromkeys() - gives details from dictionary

seq = ('1', '2', '3')

print("fromkeys() method")

print(dict1.fromkeys(seq, None))

# clear()- clears the dictionary

dict1.clear()

print("clear() function")

print("The dictionary after clearing it:", dict1)
```



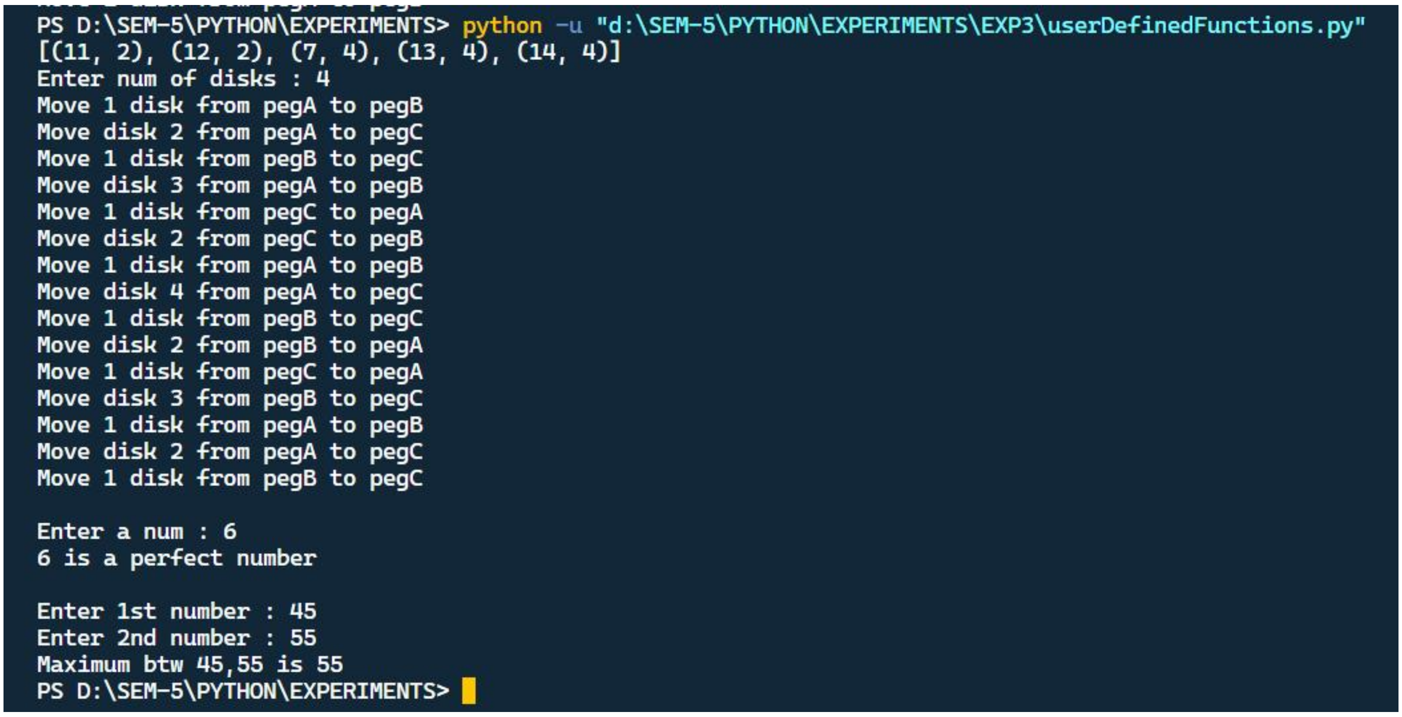
```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP3\dictionary.py"
Original dictionary: {'1': 'One', '2': 'Two', '3': 'Three'}
Copied Dictionary : {'1': 'One', '2': 'Two', '3': 'Three'}
fromkeys() method
{'1': None, '2': None, '3': None}
clear() function
The dictionary after clearing it: {}
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

User defined function :

```python
def histogram(input_list :list) -> list[int]:

    sorted_list = list(set(input_list))

    hist = []
    for i in sorted_list:
        hist.append((i,input_list.count(i)))

    histogram = sorted(hist,key=lambda x:x[1])
    return histogram

h = histogram([13,7,12,7,11,13,14,13,7,11,13,14,12,14,14,7])

print(h)

def hanoi(disks, source, aux, target):
    if disks==1:
        print(f"Move 1 disk from peg{source} to peg{target}")
        return
    hanoi(disks-1,source,target,aux)
    print(f"Move disk {disks} from peg{source} to peg{target}")
    hanoi(disks-1,aux,source,target)

disk_count = int(input("Enter num of disks : "))
hanoi(disk_count,'A','B','C')

def perfect_number(num):
    """Checks if a number is perfect or not."""
    sum = 0
    for i in range(1,num//2+1):
        if num % i == 0: sum+= I

    return True if sum==num else False

n = int(input("\nEnter a num : "))
isPerfect = perfect_number(n)
print(f"{n} is a perfect number\n") if isPerfect else print(f"{n} is a not a perfect number\n")

# code to print greatest of two number using lamda

a = int(input("Enter 1st number : "))
b = int(input("Enter 2nd number : "))

maximum = lambda a,b : a if a>b else b
```

```python
print(f"Maximum btw {a},{b} is {maximum(a,b)}")
```

Output :



```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP3\userDefinedFunctions.py"
[(11, 2), (12, 2), (7, 4), (13, 4), (14, 4)]
Enter num of disks : 4
Move 1 disk from pegA to pegB
Move disk 2 from pegA to pegC
Move 1 disk from pegB to pegC
Move disk 3 from pegA to pegB
Move 1 disk from pegC to pegA
Move disk 2 from pegC to pegB
Move 1 disk from pegA to pegB
Move disk 4 from pegA to pegC
Move 1 disk from pegB to pegC
Move disk 2 from pegB to pegA
Move 1 disk from pegC to pegA
Move disk 3 from pegB to pegC
Move 1 disk from pegA to pegB
Move disk 2 from pegA to pegC
Move 1 disk from pegB to pegC

Enter a num : 6
6 is a perfect number

Enter 1st number : 45
Enter 2nd number : 55
Maximum btw 45,55 is 55
PS D:\SEM-5\PYTHON\EXPERIMENTS>
```

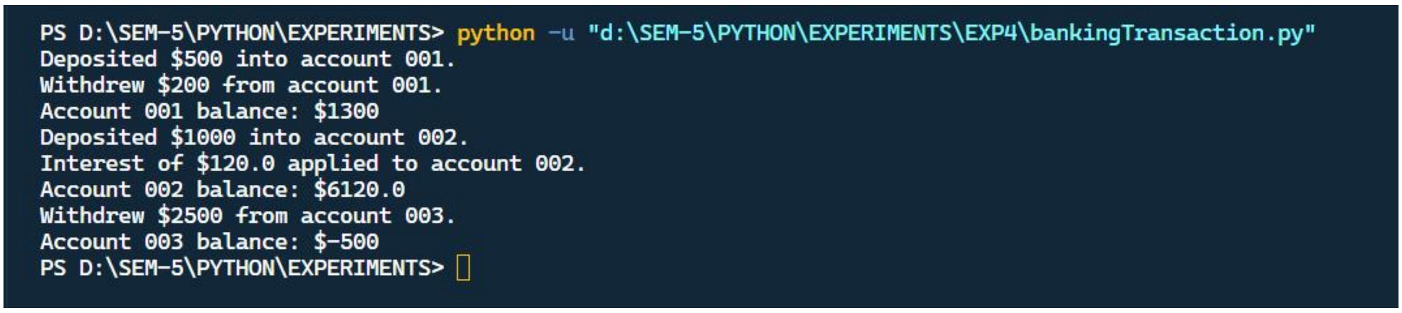
<u>Code (Experiment 4):</u>

<u>OOPs concept in banking transaction :</u>

```python
class BankAccount:

    def __init__(self, account_number, holder_name, balance=0):

        self.account_number = account_number

        self.holder_name = holder_name

        self.balance = balance


    def deposit(self, amount):

        if amount > 0:

            self.balance += amount

            print(f"Deposited ${amount} into account {self.account_number}.")

        else:

            print("Invalid deposit amount.")


    def withdraw(self, amount):

        if 0 < amount <= self.balance:
            self.balance -= amount
            print(f"Withdrew ${amount} from account {self.account_number}.")
        else:
            print("Insufficient funds or invalid withdrawal amount.")

    def display_balance(self):
        print(f"Account {self.account_number} balance: ${self.balance}")

class SavingsAccount(BankAccount):
    def __init__(self, account_number, holder_name, balance=0, interest_rate=0.01):
        super().__init__(account_number, holder_name, balance)
        self.interest_rate = interest_rate

    def apply_interest(self):
        interest = self.balance * self.interest_rate
        self.balance += interest
        print(f"Interest of ${interest} applied to account {self.account_number}.")

class CheckingAccount(BankAccount):
    def __init__(self, account_number, holder_name, balance=0, overdraft_limit=100):
        super().__init__(account_number, holder_name, balance)
        self.overdraft_limit = overdraft_limit

    def withdraw(self, amount):
        if 0 < amount <= (self.balance + self.overdraft_limit):
            self.balance -= amount
            print(f"Withdrew ${amount} from account {self.account_number}.")
        else:
            print("Insufficient funds or invalid withdrawal amount.")

class Bank:
    def __init__(self):
        self.accounts = {}
    def add_account(self, account):
        self.accounts[account.account_number] = account

    def get_account(self, account_number):
        return self.accounts.get(account_number)

# Create instances of BankAccount, SavingsAccount, and CheckingAccount
```

```python
account1 = BankAccount("001", "Alice", 1000)

savings_account1 = SavingsAccount("002", "Bob", 5000, 0.02)

checking_account1 = CheckingAccount("003", "Charlie", 2000, 500)


# Create a Bank and add accounts to it

bank = Bank()

bank.add_account(account1)

bank.add_account(savings_account1)

bank.add_account(checking_account1)


# Perform transactions

account1.deposit(500)

account1.withdraw(200)

account1.display_balance()


savings_account1.deposit(1000)

savings_account1.apply_interest()

savings_account1.display_balance()


checking_account1.withdraw(2500)

checking_account1.display_balance()
```

Output :

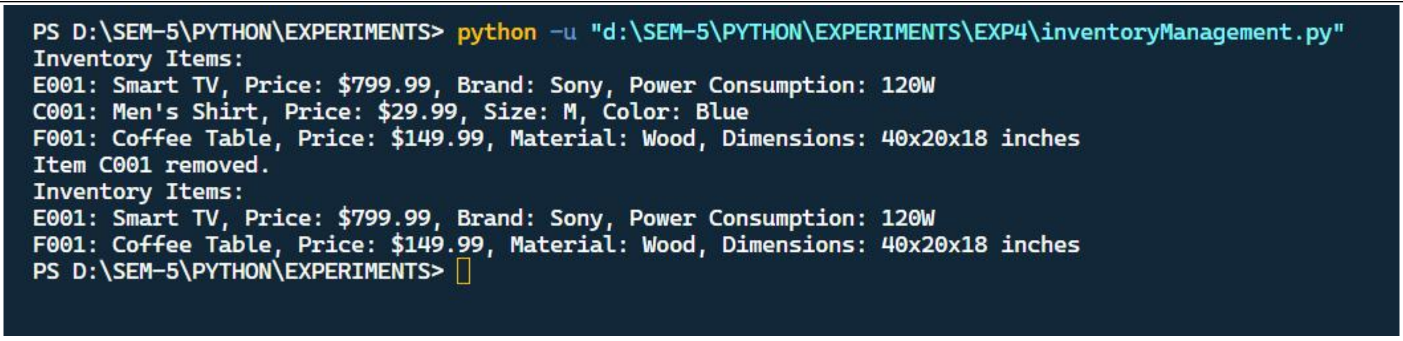


```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP4\bankingTransaction.py"
Deposited $500 into account 001.
Withdrew $200 from account 001.
Account 001 balance: $1300
Deposited $1000 into account 002.
Interest of $120.0 applied to account 002.
Account 002 balance: $6120.0
Withdrew $2500 from account 003.
Account 003 balance: $-500
PS D:\SEM-5\PYTHON\EXPERIMENTS>
```

OOPs concept in inventory management :

```python
class InventoryItem:

    def __init__(self, item_id, description, price):

        self.item_id = item_id

        self.description = description

        self.price = price


    def __str__(self):
        return f"{self.item_id}: {self.description}, Price: ${self.price:.2f}"


class Electronics(InventoryItem):
    def __init__(self, item_id, description, price, brand, power_consumption):
        super().__init__(item_id, description, price)
        self.brand = brand
        self.power_consumption = power_consumption

    def __str__(self):
        return super().__str__() + f", Brand: {self.brand}, Power Consumption: {self.power_consumption}W"


class Clothing(InventoryItem):
    def __init__(self, item_id, description, price, size, color):
        super().__init__(item_id, description, price)
        self.size = size
        self.color = color

    def __str__(self):
        return super().__str__() + f", Size: {self.size}, Color: {self.color}"


class Furniture(InventoryItem):
    def __init__(self, item_id, description, price, material, dimensions):
        super().__init__(item_id, description, price)
        self.material = material
        self.dimensions = dimensions

    def __str__(self):
        return super().__str__() + f", Material: {self.material}, Dimensions: {self.dimensions}"


class StoreInventory:
    def __init__(self):
        self.inventory = []

    def add_item(self, item):
        self.inventory.append(item)

    def remove_item(self, item_id):
        for item in self.inventory:
            if item.item_id == item_id:
                self.inventory.remove(item)
                return True
        return False

    def display_inventory(self):
        if not self.inventory:
            print("Inventory is empty.")
        else:
            print("Inventory Items:")
            for item in self.inventory:
                print(item)

# Usage example:
store_inventory = StoreInventory()

# Add items to the inventory
tv = Electronics("E001", "Smart TV", 799.99, "Sony", 120)
shirt = Clothing("C001", "Men's Shirt", 29.99, "M", "Blue")
table = Furniture("F001", "Coffee Table", 149.99, "Wood", "40x20x18 inches")

store_inventory.add_item(tv)
store_inventory.add_item(shirt)
store_inventory.add_item(table)

# Display the inventory
store_inventory.display_inventory()

# Remove an item
item_id_to_remove = "C001"
if store_inventory.remove_item(item_id_to_remove):
    print(f"Item {item_id_to_remove} removed.")
else:
    print(f"Item {item_id_to_remove} not found.")

# Display the updated inventory
store_inventory.display_inventory()
```

Output :

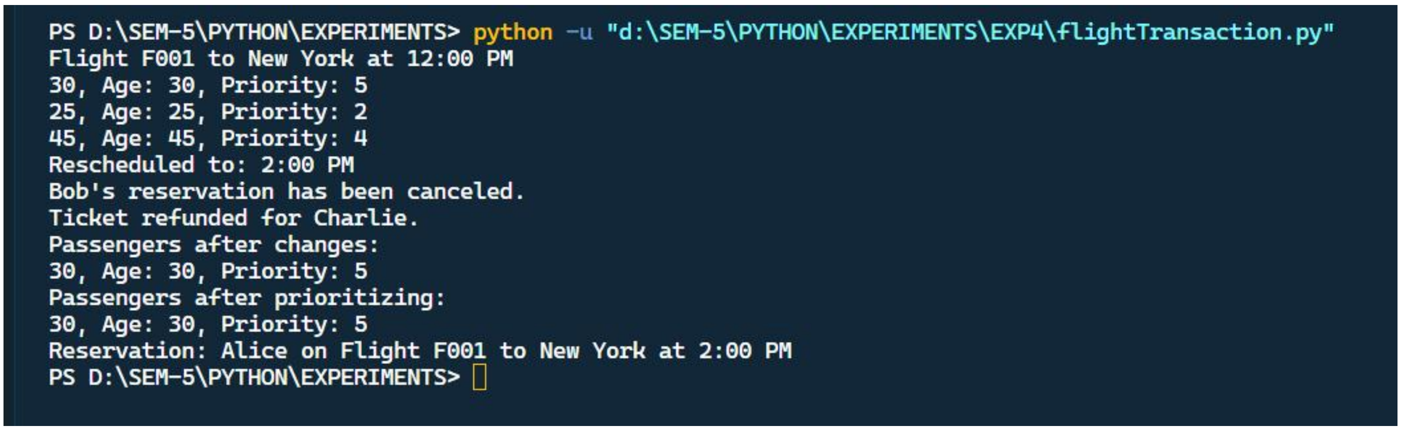


```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP4\inventoryManagement.py"
Inventory Items:
E001: Smart TV, Price: $799.99, Brand: Sony, Power Consumption: 120W
C001: Men's Shirt, Price: $29.99, Size: M, Color: Blue
F001: Coffee Table, Price: $149.99, Material: Wood, Dimensions: 40x20x18 inches
Item C001 removed.
Inventory Items:
E001: Smart TV, Price: $799.99, Brand: Sony, Power Consumption: 120W
F001: Coffee Table, Price: $149.99, Material: Wood, Dimensions: 40x20x18 inches
PS D:\SEM-5\PYTHON\EXPERIMENTS>
```

<u>OOPs concept in flight transaction :</u>

```python
class Flight:
    def __init__(self, flight_number, destination, departure_time, capacity):
        self.flight_number = flight_number
        self.destination = destination
        self.departure_time = departure_time
        self.capacity = capacity
        self.passengers = []
    def display_flight_info(self):
        return f"Flight {self.flight_number} to {self.destination} at {self.departure_time}"
    def available_seats(self):
        return self.capacity - len(self.passengers)
    def book_ticket(self, passenger):
        if self.available_seats() > 0:
            self.passengers.append(passenger)
            return True
        else:
            return False
    def reschedule_flight(self, new_departure_time):
        self.departure_time = new_departure_time
    def cancel_reservation(self, passenger):
        if passenger in self.passengers:
            self.passengers.remove(passenger)
            return True
        else:
            return False
    def refund_ticket(self, passenger):
        if passenger in self.passengers:
            self.passengers.remove(passenger)
            return True
        else:
            return False
    def prioritize_reservations(self):
        # Sort passengers by a priority criterion (e.g., frequent flyer status)
        self.passengers.sort(key=lambda passenger: passenger.priority, reverse=True)

class Passenger:
    def __init__(self, name, age, priority=0):
        self.name = name
        self.age = age
        self.priority = priority
    def __str__(self):
        return f"{self.age}, Age: {self.age}, Priority: {self.priority}"

class Reservation:
    def __init__(self, flight, passenger):
        self.flight = flight
        self.passenger = passenger
    def display_reservation(self):
        return f"Reservation: {self.passenger.name} on {self.flight.display_flight_info()}"

# Usage example:
if __name__ == "__main__":
    # Create a Flight
    flight1 = Flight("F001", "New York", "12:00 PM", 150)
    # Create Passengers
    passenger1 = Passenger("Alice", 30, 5)
    passenger2 = Passenger("Bob", 25, 2)
    passenger3 = Passenger("Charlie", 45, 4)
    # Book Tickets
    flight1.book_ticket(passenger1)
    flight1.book_ticket(passenger2)
    flight1.book_ticket(passenger3)
    # Display Flight Info and Passengers
    print(flight1.display_flight_info())
    for passenger in flight1.passengers:
        print(passenger)
    # Reschedule Flight
    flight1.reschedule_flight("2:00 PM")
    print("Rescheduled to:", flight1.departure_time)
```

```python
# Cancel Reservation
if flight1.cancel_reservation(passenger2):
    print(f"{passenger2.name}'s reservation has been canceled.")
# Refund Ticket
if flight1.refund_ticket(passenger3):
    print(f"Ticket refunded for {passenger3.name}.")
# Display Passengers after changes
print("Passengers after changes:")
for passenger in flight1.passengers:
    print(passenger)
# Prioritize Reservations
flight1.prioritize_reservations()
print("Passengers after prioritizing:")
for passenger in flight1.passengers:
    print(passenger)
# Create Reservation
reservation = Reservation(flight1, passenger1)
print(reservation.display_reservation())
```



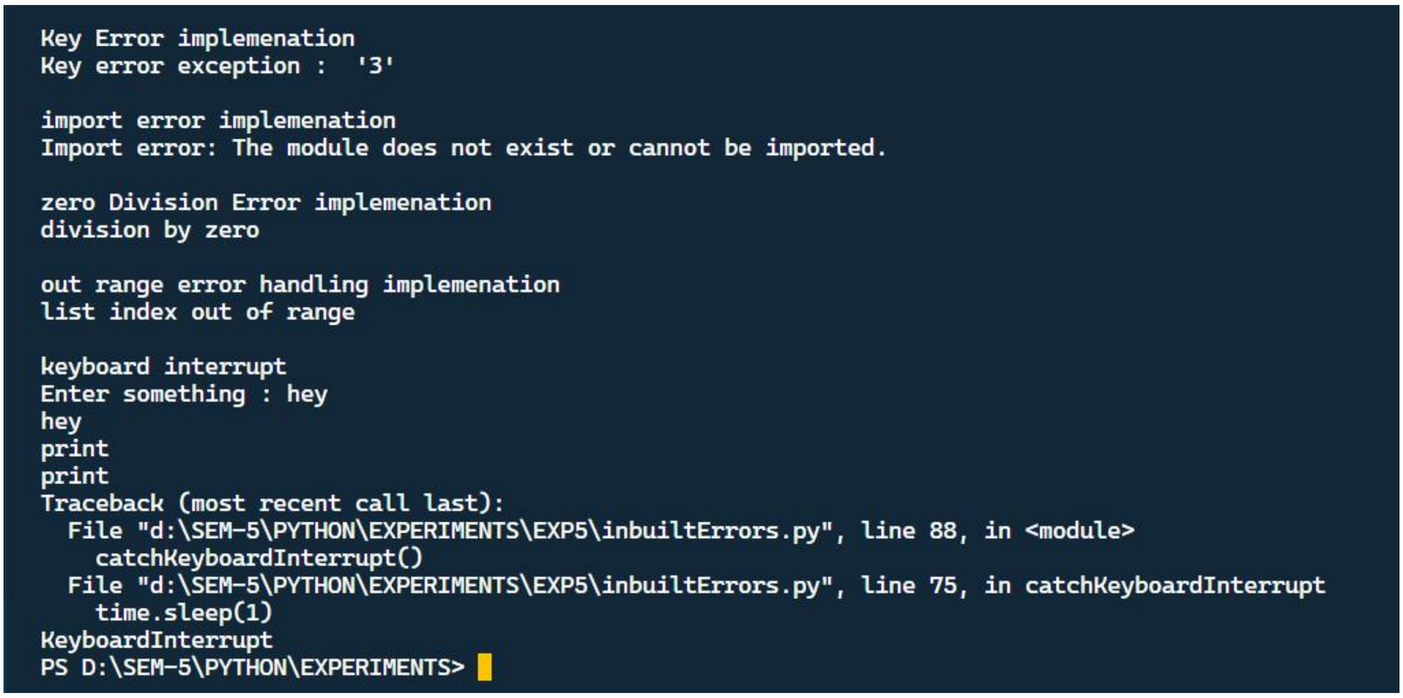
```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP4\flightTransaction.py"
Flight F001 to New York at 12:00 PM
30, Age: 30, Priority: 5
25, Age: 25, Priority: 2
45, Age: 45, Priority: 4
Rescheduled to: 2:00 PM
Bob's reservation has been canceled.
Ticket refunded for Charlie.
Passengers after changes:
30, Age: 30, Priority: 5
Passengers after prioritizing:
30, Age: 30, Priority: 5
Reservation: Alice on Flight F001 to New York at 2:00 PM
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

Code (Experiment 5) :

Inbuild error and their handling :

```
import math

import time



def catchKeyError():

    print("\nKey Error implemenation")

    try:

        dic = {'1':'params','2':'query'}

        print(dic['3'])

    except KeyError as ke:

        print('Key error exception : ',ke)


def catchImportError():

    print("\nimport error implemenation")

    try:

        import nonexistent_module

    except ImportError:

        print("Import error: The module does not exist or cannot be imported.")


def catchZeroDivError():

    print("\nzero Division Error implemenation")

    try:

        print(9/0)

    except ZeroDivisionError as e:

        print€


def catchRangeError():

    print("\nout range error handling implemenation")

    try:

        l = []

        print(l[1])

    except Exception as e:

        print(e)


def catchKeyboardInterrupt():

    print('\nkeyboard interrupt ')
    try:

        print(input("Enter something : "))

        while True:

            print('print')

            time.sleep(1)

    except Exception as kbe:

    print(kbe)

# create a custom exception


catchKeyError()

catchImportError()

catchZeroDivError()

catchRangeError()

catchKeyboardInterrupt()
```

Output :

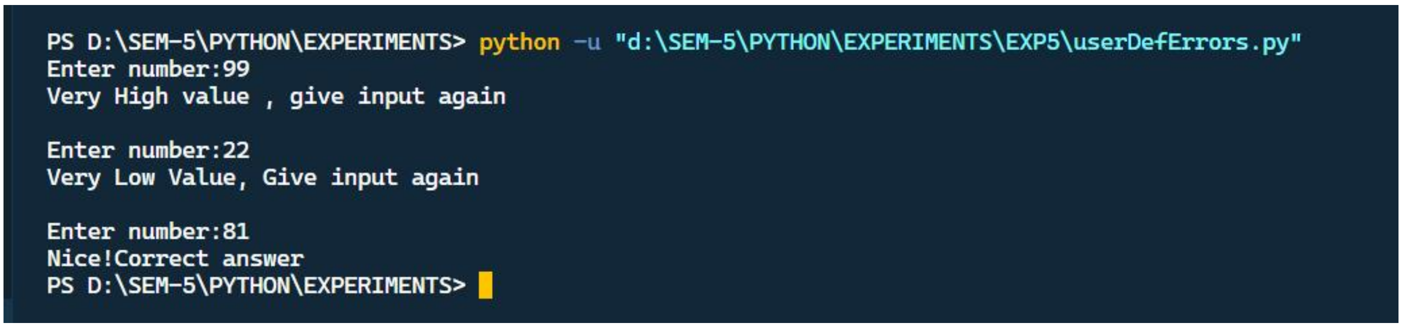


```
Key Error implemenation
Key error exception :  '3'

import error implemenation
Import error: The module does not exist or cannot be imported.

zero Division Error implemenation
division by zero

out range error handling implemenation
list index out of range

keyboard interrupt
Enter something : hey
hey
print
print
Traceback (most recent call last):
  File "d:\SEM-5\PYTHON\EXPERIMENTS\EXP5\inbuiltErrors.py", line 88, in <module>
    catchKeyboardInterrupt()
  File "d:\SEM-5\PYTHON\EXPERIMENTS\EXP5\inbuiltErrors.py", line 75, in catchKeyboardInterrupt
    time.sleep(1)
KeyboardInterrupt
PS D:\SEM-5\PYTHON\EXPERIMENTS>
```

User defined Error Handling :

```
class BaseError(Exception):pass

class HighValueError(Exception):pass

class LowValueError(Exception):pass

value = 81

while(1):
    try:
        n=int(input("Enter number:"))
        if n>value:
            raise HighValueError
        elif n < value:
            raise LowValueError
        else:
            print("Nice!Correct answer")
            break
    except LowValueError:
        print("Very Low Value, Give input again")
        print()
    except HighValueError:
        print("Very High value , give input again")
        print()
```

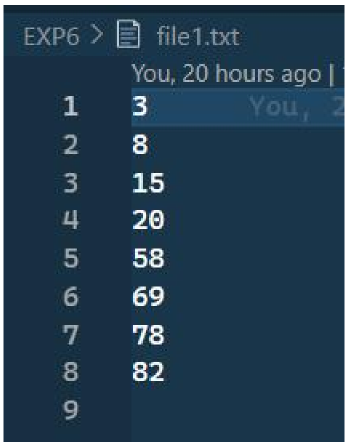
Output :



```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP5\userDefErrors.py"
Enter number:99
Very High value , give input again

Enter number:22
Very Low Value, Give input again

Enter number:81
Nice!Correct answer
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

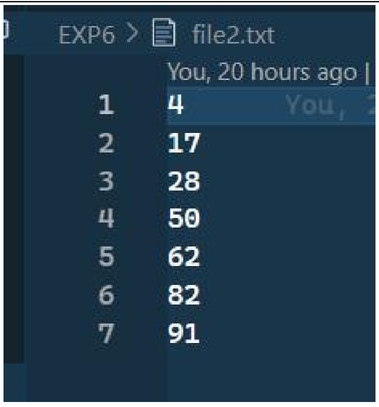
<u>Code (Experiment 6):</u>

<u>File1.txt contains :</u>



```
3
8
15
20
58
69
78
82

```

<u>File2.txt contains :</u>


EXP6 > file2.txt

You, 20 hours ago |

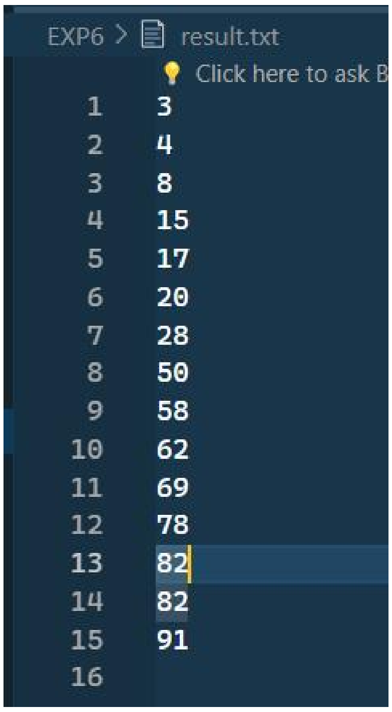
```
4
17
28
50
62
82
91
```

Sorting code :

```python
def getValueAtIndex(content,index):
    return int(content[index].strip())


with open('file1.txt','r') as f, open('file2.txt','r') as g, open('sort.txt','w') as s:
    i = j = 0
    k = 1

    content1, content2 = f.readlines(), g.readlines()

    len1 = len(content1)
    len2 = len(content2)

    while(i<len1 and j<len2):
        value1, value2 = int(content1[i].strip()), int(content2[j].strip())
        if value1 < value2:
            s.write(str(value1)+"\n")
            i+=1
        elif value1 > value2:
            s.write(str(value2)+"\n")
            j+=1
        else:
            s.write(str(value1)+"\n")
            s.write(str(value2)+"\n")
            i+=1
            j+=1
    while(i<len1):
        value1 = content1[i].strip()
        s.write(str(value1)+"\n")
        i+=1

    while(j<len2):
        value2 = content2[j].strip()
        s.write(str(value2)+"\n")
        j+=1
```

Result :

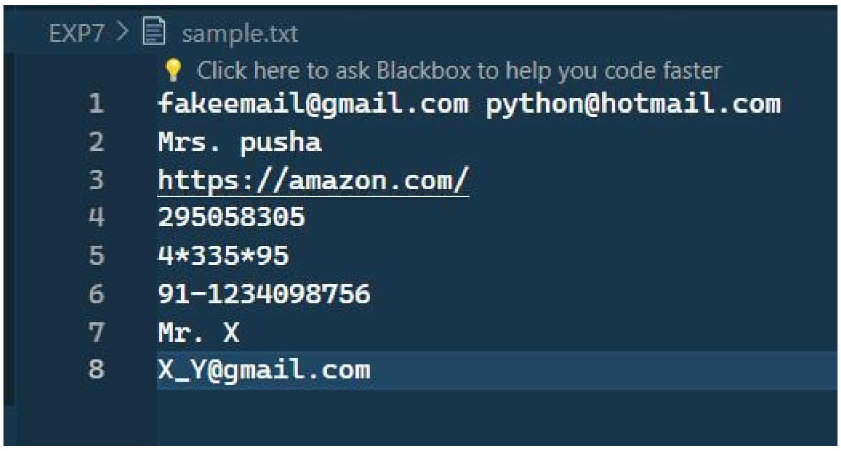
A new file named as file3.txt is created and contains element as :



```
3
4
8
15
17
20
28
50
58
62
69
78
82
82
91

```

Code (Experiment 7):

Sample text where re is to be applied :

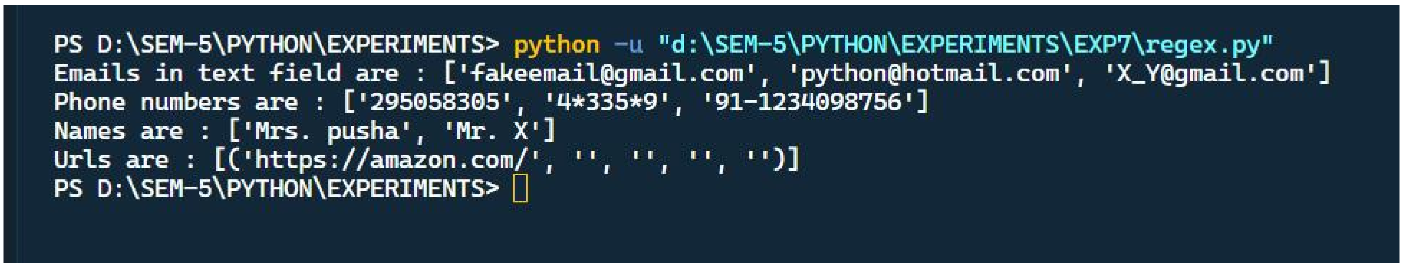


```
fakeemail@gmail.com python@hotmail.com
Mrs. pusha
https://amazon.com/
295058305
4*335*95
91-1234098756
Mr. X
X_Y@gmail.com
```

Code for re :

```python
import re

file = open('sample.txt')

text = file.read()

email_pat = r'[a-zA-Z0-9\.\+_]+@[a-zA-Z0-9\.\+]+.com'

mob_pat = r'[0-9]+[#\-*]*[0-9]+[0-9]+[#\-*]*[0-9]'

url_pat = r"(?i)\b((?:https?://|www\d{0,3}[.]|[a-z0-9.\-]+[.][a-
z]{2,4}/)(?:[^\s()<>]+|\(([^\s()<>]+|(\([^\s()<>]+\)))*\))+(?:\(([^\s()<>]+|(\([^\s()<>]+\)))*\)|[^\s`!()\[\]{};:
'\".,<>?«»“”‘’]))"

name_pat = r'M(?:r\.|rs\.|s\.) [a-zA-Z]+'


print(f"Emails in text field are : {re.findall(email_pat,text)}")

print(f"Phone numbers are : {re.findall(mob_pat,text)}")

print(f"Names are : {re.findall(name_pat,text)}")

print(f"Urls are : {re.findall(url_pat,text)}")
```

Output :



```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP7\regex.py"
Emails in text field are : ['fakeemail@gmail.com', 'python@hotmail.com', 'X_Y@gmail.com']
Phone numbers are : ['295058305', '4*335*9', '91-1234098756']
Names are : ['Mrs. pusha', 'Mr. X']
Urls are : [('https://amazon.com/', '', '', '', '')]
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

Code (Experiment 8) :

1) code for database creation and table creation:

```
import mysql.connector

mydb = mysql.connector.connect(

    host="localhost",

    user="root",

    password="xxx",

)

mycursor.execute("CREATE DATABASE electronics")

mycursor = mydb.cursor()

mycursor.execute("""

                 CREATE TABLE LAPTOP(

                    Id int(11) NOT NULL,

                    Name varchar(250) NOT NULL,

                    Price float NOT NULL,

                    Purchase_date Date NOT NULL,

                    PRIMARY KEY(Id)

                 )

                 """)

mydb.commit()
```

2) code for insering values in table :

Single values query :

```
import mysql.connector

mydb = mysql.connector.connect(

    host="localhost",

    user="root",

    password="xxx",

    database="electronics"

)

mycursor.execute("""

                 INSERT INTO LAPTOPS(Id, Name, Price, Purchase_date) VALUES(15,'Acer aspire 7','52000','2019-
08-17')

                 """)

mydb.commit()
```

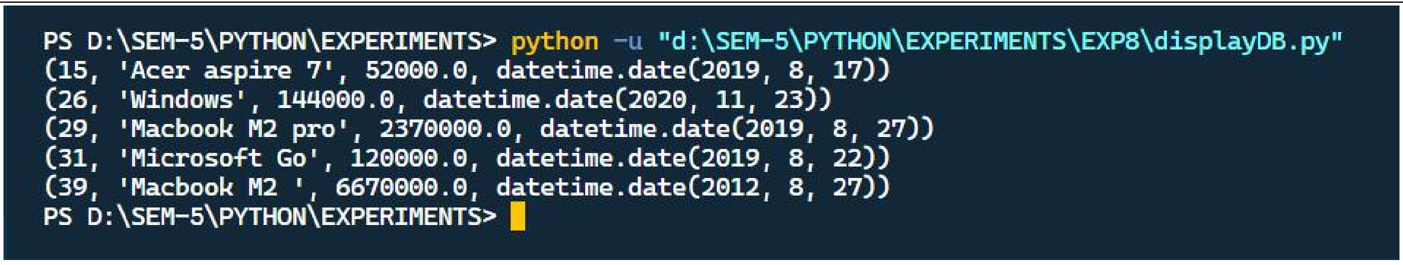
Multiple values query :

```
import mysql.connector

mydb = mysql.connector.connect(

    host="localhost",

    user="root",

    password="xxx",

    database="electronics"

)

mycursor = mydb.cursor()

sql = """

        INSERT INTO LAPTOP(Id, Name, Price, Purchase_date, Rating) VALUES(%s, %s, %s, %s, %s)

                  """

val = [(31,'Microsoft Go','120000','2019-08-22',4.1),(29,'Macbook M2 pro','2370000','2019-08-27',4.7)]

mycursor.executemany(sql,val)

mydb.commit()
```

3) code for displaying rows in table :

```
import mysql.connector

mydb = mysql.connector.connect(

    host="localhost",

    user="root",

    password="xxx",

    database="electronics"

)

mycursor = mydb.cursor()

mycursor.execute("SELECT * FROM Laptop")

res = mycursor.fetchall()

for x in res:

        print(x)
```

Output :

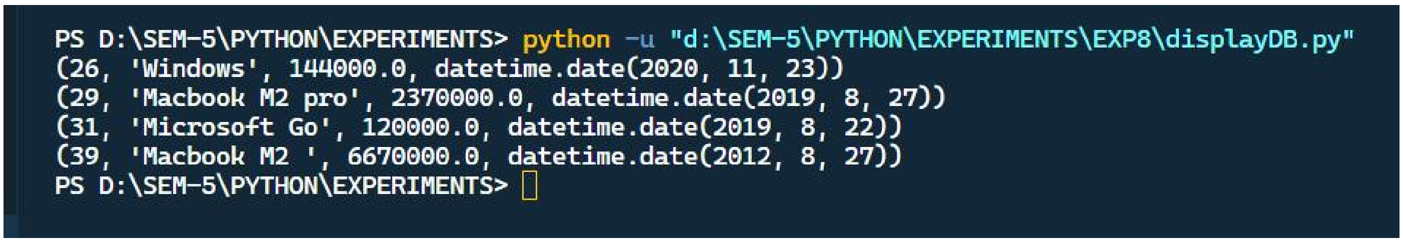


```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP8\displayDB.py"
(15, 'Acer aspire 7', 52000.0, datetime.date(2019, 8, 17))
(26, 'Windows', 144000.0, datetime.date(2020, 11, 23))
(29, 'Macbook M2 pro', 2370000.0, datetime.date(2019, 8, 27))
(31, 'Microsoft Go', 120000.0, datetime.date(2019, 8, 22))
(39, 'Macbook M2 ', 6670000.0, datetime.date(2012, 8, 27))
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

4) <u>code for deleting specific row in table :</u>

```
import mysql.connector

mydb = mysql.connector.connect(

    host="localhost",

    user="root",

    password="xxx",

    database="electronics"

)

mycursor = mydb.cursor()

mycursor.execute("DELETE FROM Laptop WHERE Id = 17")

mydb.commit()

res = mycursor.fetchall()

for x in res:

    print(x)
```

<u>Table after deletion :</u>

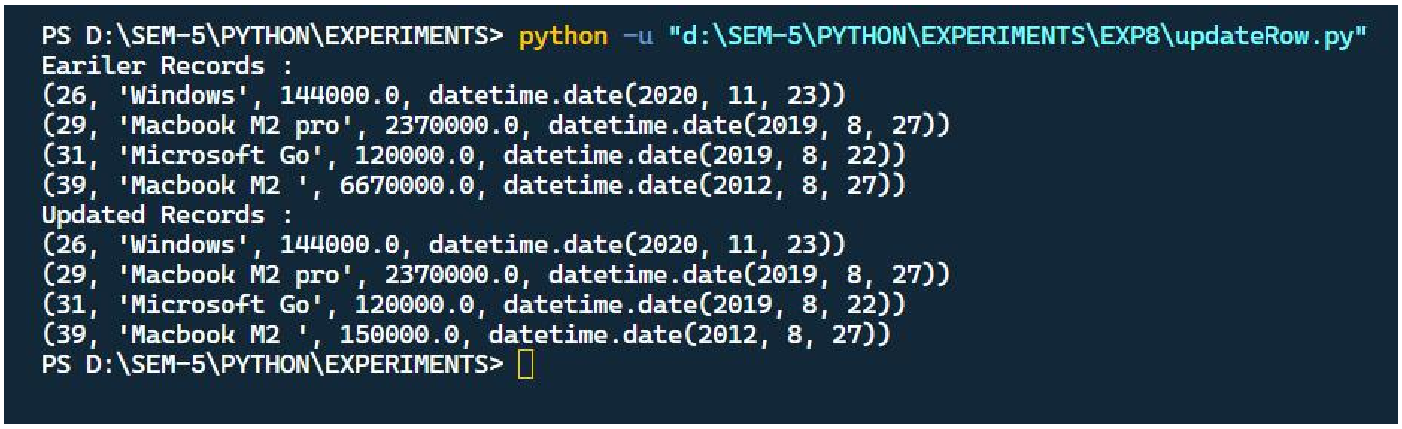


```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP8\displayDB.py"
(26, 'Windows', 144000.0, datetime.date(2020, 11, 23))
(29, 'Macbook M2 pro', 2370000.0, datetime.date(2019, 8, 27))
(31, 'Microsoft Go', 120000.0, datetime.date(2019, 8, 22))
(39, 'Macbook M2 ', 6670000.0, datetime.date(2012, 8, 27))
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

5) <u>code for upadting specific row in table :</u>

```
import mysql.connector

mydb = mysql.connector.connect(

    host="localhost",

    user="root",
    password="xxx",
    database="electronics"
)
mycursor = mydb.cursor()
print("Eariler Records : ")
mycursor.execute("SELECT * FROM Laptop")
res = mycursor.fetchall()
for x in res:
    print(x)
mycursor.execute("UPDATE Laptop SET Price = 150000 WHERE Id = 16")
mydb.commit()
print("Updated Records : ")
mycursor = mydb.cursor()
mycursor.execute("SELECT * FROM Laptop")
res = mycursor.fetchall()
for x in res:
        print(x)
```

Output :

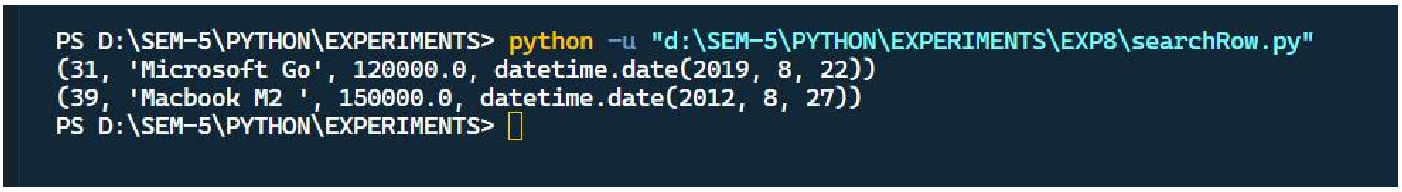


```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP8\updateRow.py"
Eariler Records :
(26, 'Windows', 144000.0, datetime.date(2020, 11, 23))
(29, 'Macbook M2 pro', 2370000.0, datetime.date(2019, 8, 27))
(31, 'Microsoft Go', 120000.0, datetime.date(2019, 8, 22))
(39, 'Macbook M2 ', 6670000.0, datetime.date(2012, 8, 27))
Updated Records :
(26, 'Windows', 144000.0, datetime.date(2020, 11, 23))
(29, 'Macbook M2 pro', 2370000.0, datetime.date(2019, 8, 27))
(31, 'Microsoft Go', 120000.0, datetime.date(2019, 8, 22))
(39, 'Macbook M2 ', 150000.0, datetime.date(2012, 8, 27))
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

6) code for searching specific row in table:

```
import mysql.connector
mydb = mysql.connector.connect(
    host="localhost",
    user="root",
    password="xxx",
    database="electronics"
)
mycursor = mydb.cursor()
mycursor.execute("SELECT * FROM Laptop WHERE Rating > 3")
```

```
res = mycursor.fetchall()

for x in res:

    print(x)
```

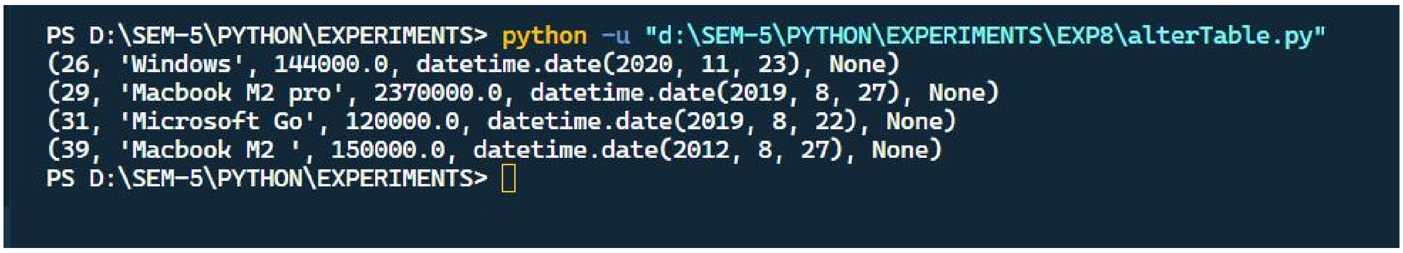


```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP8\searchRow.py"
(31, 'Microsoft Go', 120000.0, datetime.date(2019, 8, 22))
(39, 'Macbook M2 ', 150000.0, datetime.date(2012, 8, 27))
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

7) <u>code for altering table:</u>

```
import mysql.connector

mydb = mysql.connector.connect(

    host="localhost",

    user="root",

    password="xxx",

    database="electronics"

)

mycursor = mydb.cursor()

mycursor.execute("ALTER TABLE Laptop ADD payment_mode varchar(250)")

mydb.commit()

mycursor.execute("SELECT * FROM Laptop")

res = mycursor.fetchall()

for x in res:

print(x)
```

<u>**Output where a new column is added :**</u>

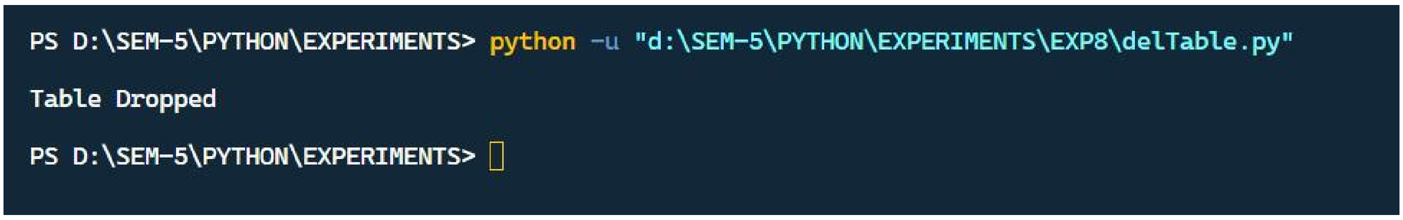


```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP8\alterTable.py"
(26, 'Windows', 144000.0, datetime.date(2020, 11, 23), None)
(29, 'Macbook M2 pro', 2370000.0, datetime.date(2019, 8, 27), None)
(31, 'Microsoft Go', 120000.0, datetime.date(2019, 8, 22), None)
(39, 'Macbook M2 ', 150000.0, datetime.date(2012, 8, 27), None)
PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

8) <u>code for deleting table and database :</u>

```
import mysql.connector

mydb = mysql.connector.connect(

 host="localhost",

 user="root",

 password="xxx",

 database="electronics"
)
mycursor = mydb.cursor()

mycursor.execute("DROP TABLE LAPTOPS")

print('\nTable Dropped\n')

mydb.commit()

mycursor.execute("DROP DATABASE electronics")

mydb.close()
```

Output :



```
PS D:\SEM-5\PYTHON\EXPERIMENTS> python -u "d:\SEM-5\PYTHON\EXPERIMENTS\EXP8\delTable.py"

Table Dropped

PS D:\SEM-5\PYTHON\EXPERIMENTS> 
```

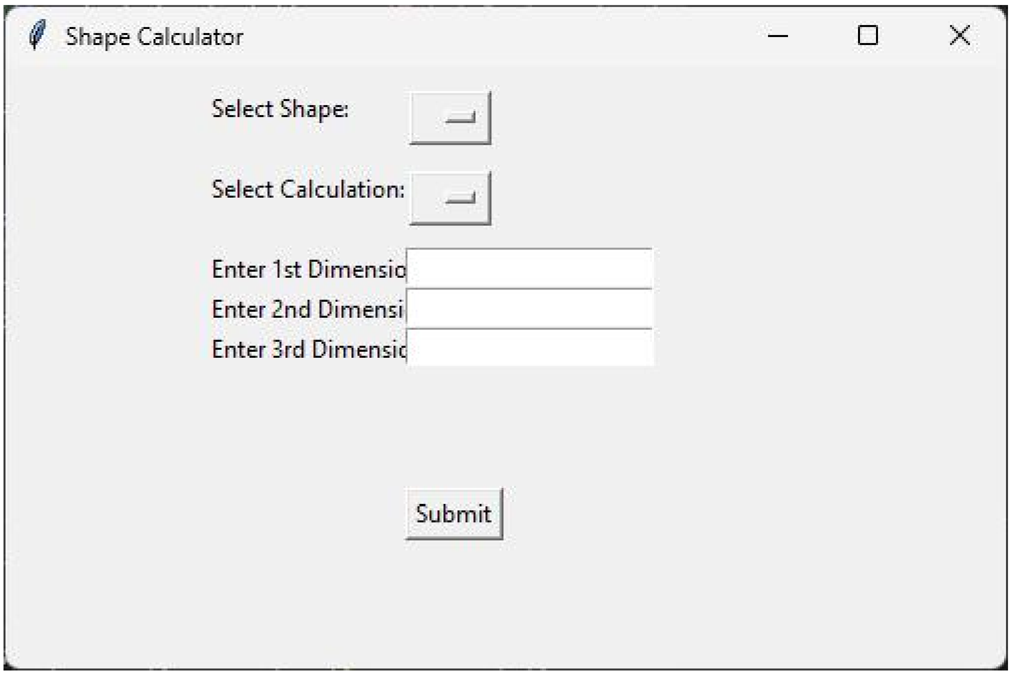
Code (Experiment 9) :

```
from tkinter import *

class MyWindow:

    def __init__(self, win):

        self.lbl1 = Label(win, text='Select Shape:')

        self.lbl2 = Label(win, text='Select Calculation:')

        self.t1 = StringVar()

        self.t2 = StringVar()

        shapes = ['Circle', 'Rectangle', 'Sphere', 'Cone']

        calculations = ['Area', 'Perimeter', 'Curved Area', 'Volume', 'Total Surface Area']

        self.shape_dropdown = OptionMenu(win, self.t1, *shapes)

        self.calculation_dropdown = OptionMenu(win, self.t2, *calculations)

        self.shape_dropdown.place(x=200, y=10)

        self.calculation_dropdown.place(x=200, y=50)

        self.lbl1.place(x=100, y=10)

        self.lbl2.place(x=100, y=50)

        self.dimension_label_1 = Label(win, text='Enter 1st Dimension:')

        self.dimension_label_1.place(x=100, y=90)

        self.dimension_entry_1 = Entry(win)

        self.dimension_entry_1.place(x=200, y=90)

        self.dimension_label_2 = Label(win, text='Enter 2nd Dimension:')

        self.dimension_label_2.place(x=100, y=110)

        self.dimension_entry_2 = Entry(win)

        self.dimension_entry_2.place(x=200, y=110)

        self.dimension_label_3 = Label(win, text='Enter 3rd Dimension:')

        self.dimension_label_3.place(x=100, y=130)

        self.dimension_entry_3 = Entry(win)

        self.dimension_entry_3.place(x=200, y=130)

        self.result_label = Label(win, text='')

        self.result_label.place(x=200, y=170)

        self.btn = Button(text='Submit', command=self.calculate)

        self.btn.place(x=200, y=210)


    def calculate(self):

        selected_shape = self.t1.get()

        selected_calculation = self.t2.get()

        d1 = self.dimension_entry_1.get()

        d2 = self.dimension_entry_2.get()

        d3 = self.dimension_entry_3.get()
```

```python
        result = "Result: "

        if selected_shape == 'Circle':

            if selected_calculation == 'Area':

                res = str(3.14 * float(d1)*float(d1))

                result += res

            elif selected_calculation == 'Perimeter':

                result += "no Perimeter Calculation"

            elif selected_calculation == 'Curved Area':

                result += "Circle Curved Area Calculation"

        elif selected_shape == 'Rectangle':

            if selected_calculation == 'Area':

                res = float(d1) * float(d2)

                result += str(res)

            elif selected_calculation == 'Perimeter':

                res = 2 * (float(d1) + float(d2))

                result += str(res)

            elif selected_calculation == 'Curved Area':

                result += "no Curved Area Calculation"

        elif selected_shape == 'Sphere':

            if selected_calculation == 'Volume':

                res = 1.33 * 3.14 * (float(d1) * float(d1) * float(d1))

                result += str(res)

            elif selected_calculation == 'Perimeter':

                result += "no Perimeter Calculation"


            elif selected_calculation == 'Area':

                result += "no Area Calculation"

            elif selected_calculation == 'Total Surface Area':

                res = 4 * 3.14 * (float(d1) * float(d1))

                result += str(res)

        elif selected_shape == 'Cone':

            if selected_calculation == 'Volume':

                res = 0.3333 * 3.14 * (float(d1) * float(d1)) * float(d2)

                result += str(res)

            elif selected_calculation == 'Perimeter':

                result += "no Perimeter Calculation"

            elif selected_calculation == 'Area':

                result += "no Area Calculation"

            elif selected_calculation == 'Total Surface Area':

                res = 3.14 * float(d1) * (float(d1) + float(d2))
                result += str(res)

        self.result_label.config(text=result)


window = Tk()


mywin = MyWindow(window)

window.title('Shape Calculator')

window.geometry("500x300+10+10")

window.mainloop()
```

Output Screen :

Intial screen :



Select Shape:

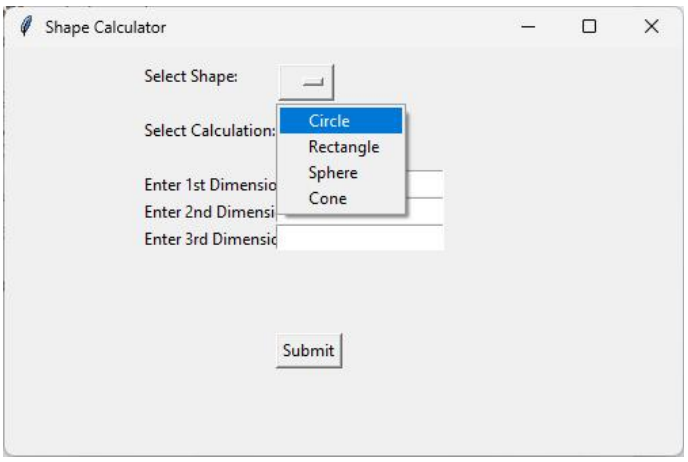
Select Calculation:

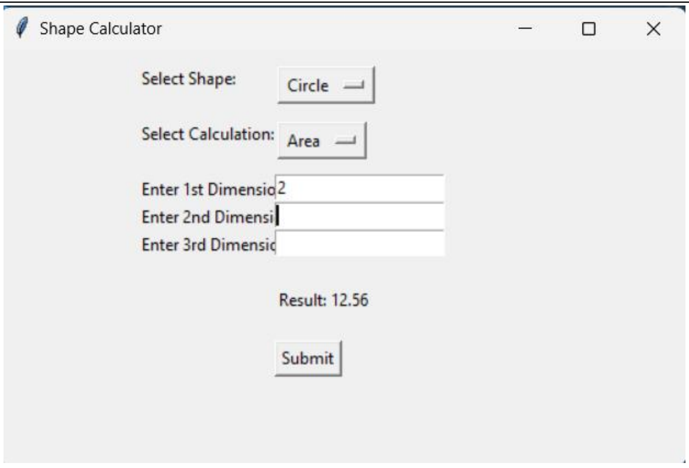
Enter 1st Dimensio

Enter 2nd Dimensi

Enter 3rd Dimensic

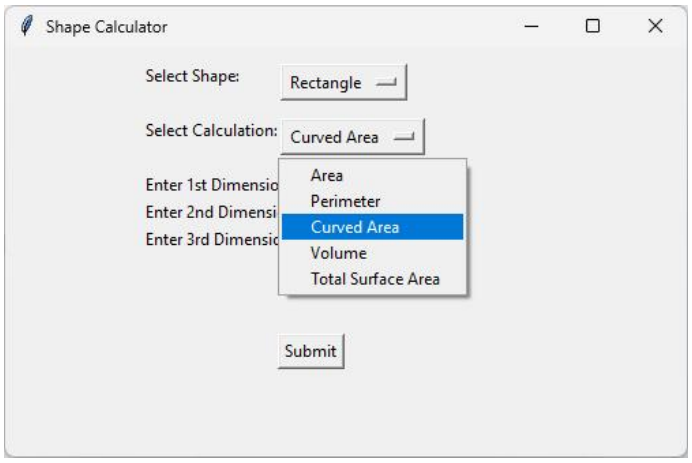
selecting Shape , calculation type and entering values :

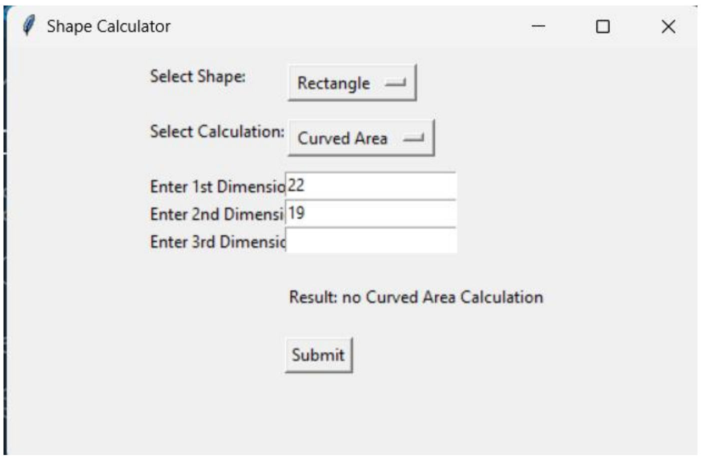




Result: 12.56

Selecting wrong configuration :

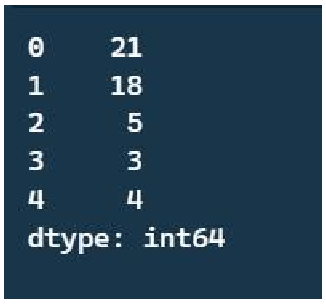




Result: no Curved Area Calculation

Code (Experiment 10) :

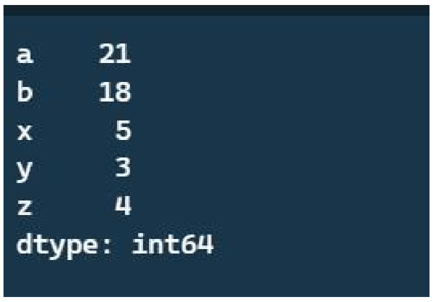
```
import pandas as pd

list1=[]

var1=pd.Series(list1)

print(var1)
```



```
0    21
1    18
2     5
3     3
4     4
dtype: int64
```

Giving custom indexes :

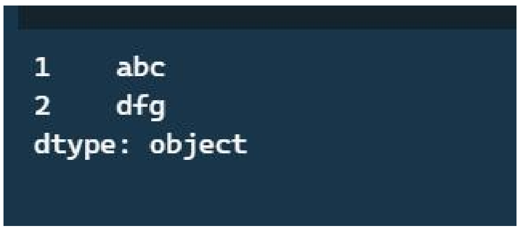
```
var1=pd.Series(list1,index=['a','b','x','y','z'])

print(var1)
```



```
a    21
b    18
x     5
y     3
z     4
dtype: int64
```

series for dictionary :

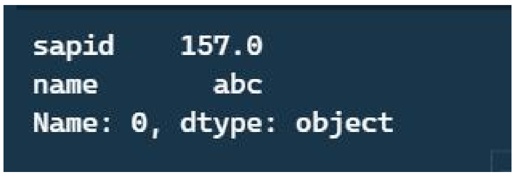
```
dist1={'1':'abc','2':'dfg'}

var1=pd.Series(dist1)

print(var1)
```



```
1    abc
2    dfg
dtype: object
```

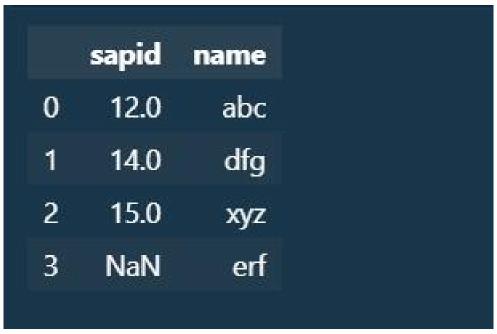
creating a DataFrame and printing value of index 0:

```
data={

    'sapid':[157,159,161,None],

    'name':['abc','dfg','xyz',None]
}
df=pd.DataFrame(data)
df.loc[0]
```



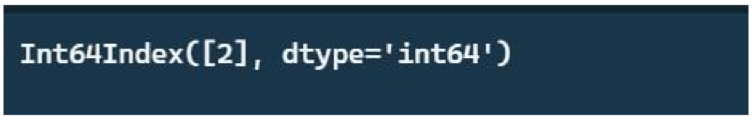
```
sapid     157.0
name        abc
Name: 0, dtype: object
```

Finding the Index of Rows in a DataFrame Where the 'name' Column is 'abc :



```
   sapid  name
0  12.0   abc
1  14.0   dfg
2  15.0   xyz
3  NaN    erf
```

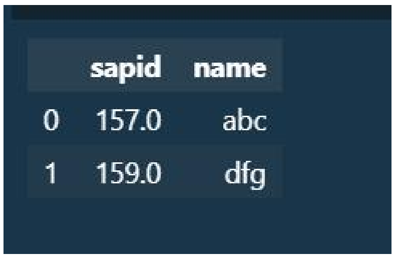
```
row=df.loc[df['name']=='xyz'].index
row
```



```
Int64Index([2], dtype='int64')
```

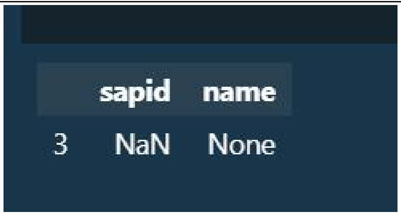
Use of head ,tail, info, finding null values in Dataframe :

```
df.head(2)
```



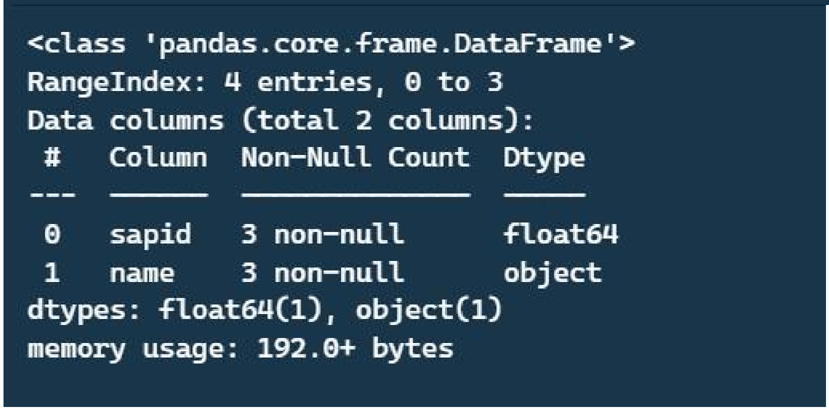
```
   sapid  name
0  157.0  abc
1  159.0  dfg
```

```
df.tail(1)
```



	sapid	name
3	NaN	None

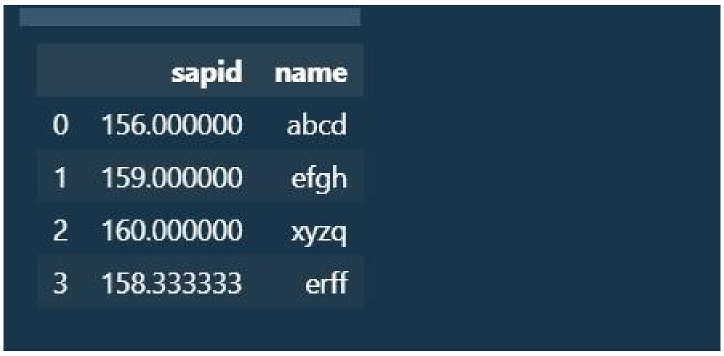
```
df.info()
```



```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4 entries, 0 to 3
Data columns (total 2 columns):
 #   Column  Non-Null Count  Dtype  
---  ------  --------------  -----  
 0   sapid   3 non-null      float64
 1   name    3 non-null      object 
dtypes: float64(1), object(1)
memory usage: 192.0+ bytes
```

<u>filling Null Values with mean :</u>

```
data={

    'sapid':[156,159,160,None],

    'name':['abcd','efgh','xyzq','erff']

}

df=pd.DataFrame(data)


df.fillna(df.mean())
```

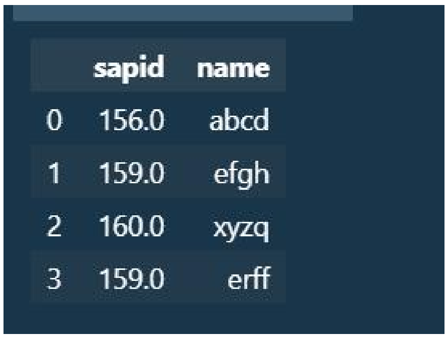


	sapid	name
0	156.000000	abcd
1	159.000000	efgh
2	160.000000	xyzq
3	158.333333	erff

<u>filling Null Values with median:</u>

```
data={

    'sapid':[156,159,160,None],

    'name':['abcd','efgh','xyzq','erff']

}

df=pd.DataFrame(data)
```

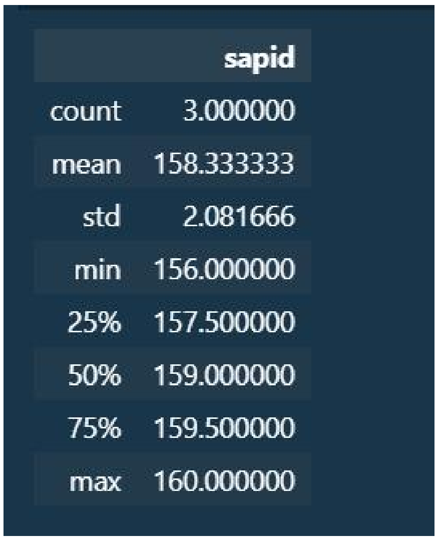
```
df.fillna(df.median())
```



	sapid	name
0	156.0	abcd
1	159.0	efgh
2	160.0	xyzq
3	159.0	erff

Use of Describe method :

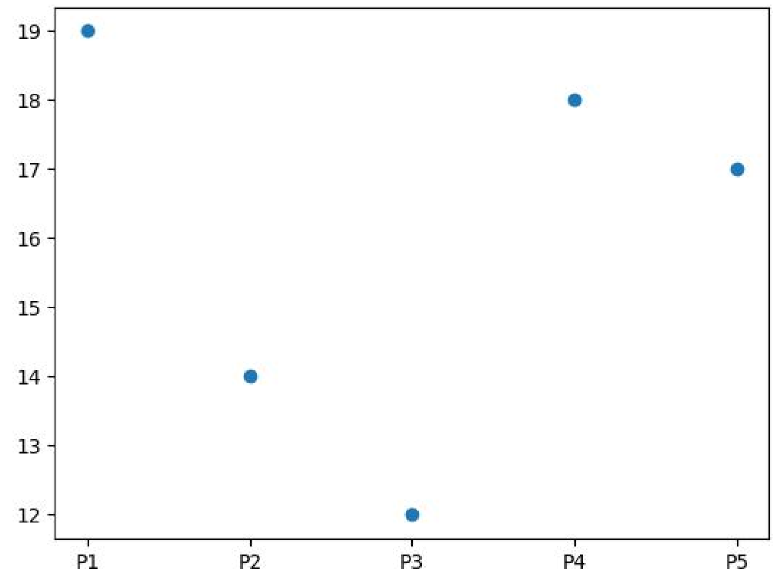
```
df.describe()
```



	sapid
count	3.000000
mean	158.333333
std	2.081666
min	156.000000
25%	157.500000
50%	159.000000
75%	159.500000
max	160.000000

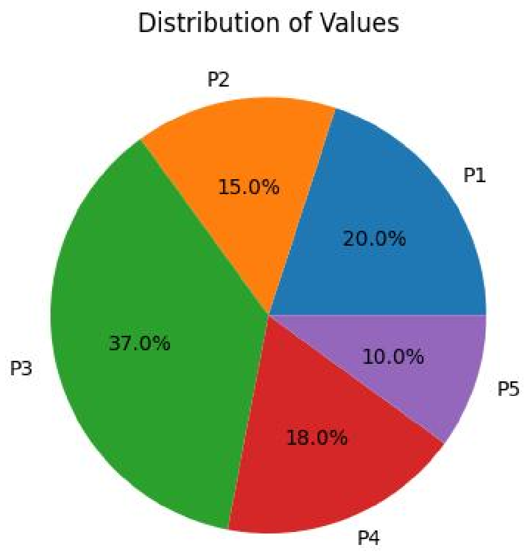
Plotting a graph :

```
import matplotlib.pyplot as plt

import numpy as np

x=np.array(['P1','P2','P3','P4','P5'])

y=np.array([19,14,12,18,17])

plt.scatter(x,y)

plt.show()
```



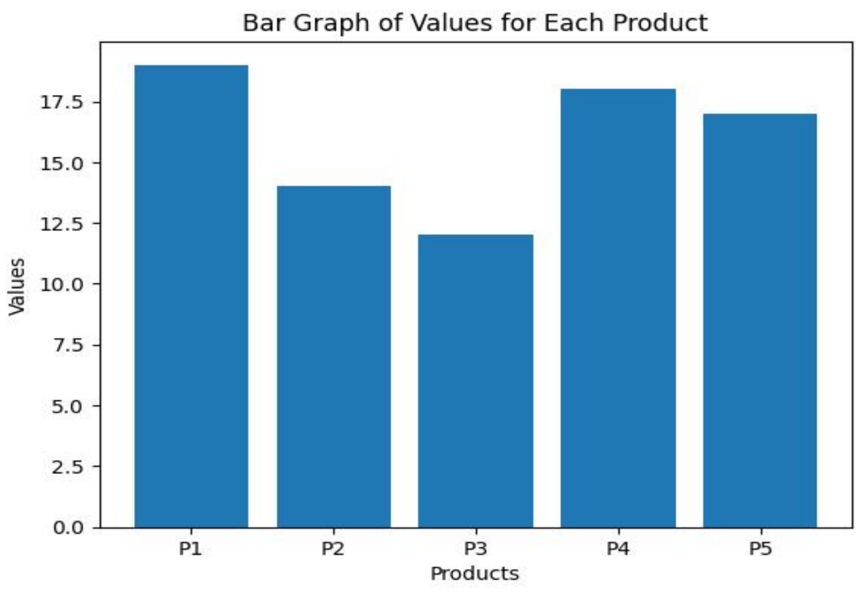
Plotting a Piechart :

```
x = np.array(['P1', 'P2', 'P3', 'P4', 'P5'])

y = np.array([20, 15, 37, 18, 10])


plt.pie(y, labels=x, autopct='%1.1f%%')

plt.title('Distribution of Values')

plt.show()
```



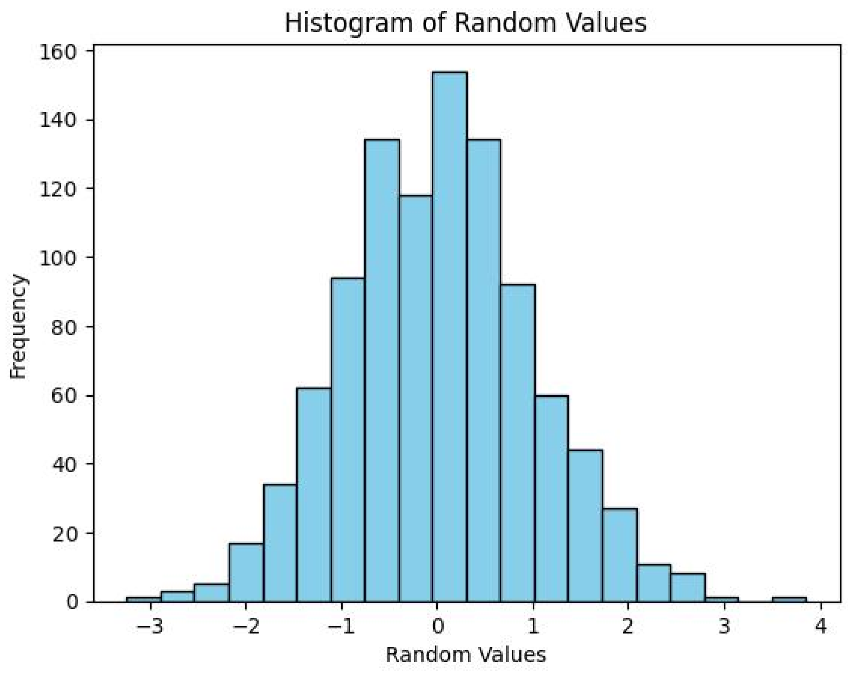
Plotting a bargraph:

```
x = np.array(['P1', 'P2', 'P3', 'P4', 'P5'])

y = np.array([19, 14, 12, 18, 17])


plt.bar(x, y)

plt.xlabel('Products')

plt.ylabel('Values')

plt.title('Bar Graph of Values for Each Product')

plt.show()
```



Plotting a histogram:

```
import matplotlib.pyplot as plt

import numpy as np


np.random.seed(42)

data = np.random.randn(1000)


plt.hist(data, bins=20, color='skyblue', edgecolor='black')


plt.xlabel('Random Values')

plt.ylabel('Frequency')

plt.title('Histogram of Random Values')


plt.show()
```


Histogram of Random Values
Frequency
160
140
120
100
80
60
40
20
0
−3
−2
−1
0
1
2
3
4
Random Values