AIM:-

Write a Program to evaluate factorial , palindrome ,swapping two numbers and perform basic operations in lists, tuples, sets and dictionaries.

PROGRAM:-

```
a=int(input("enter first number:-"))
b=int(input("enter second number:-"))
print("numbers before swapping:-")
print("a=",a,"b=",b)
swap=a
a=b
b=swap
print("numbers after swapping:-")
print("a=",a,"b=",b)
if a<0:
    print("first number",a,"is negative")
else:
    print("first number",a,"is not negative")
```

OUTPUT:-

```
Python 3.12.1 (tags/v3.12.1:2305ca5, Dec  7 2023, 22:03:25) [MSC v.1937 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

= RESTART: C:/Users/HP/Desktop/python/swap.py
enter first number:-5
enter second number:-6
numbers before swapping:-
a= 5 b= 6
numbers after swapping:-
a= 6 b= 5
first number 6 is not negative
```

THEORY:-

A palindrome is a sequence of characters that reads the same forwards as backward. In the context of numbers, a palindrome number remains unchanged when its digits are reversed. Palindromes are interesting in various fields, including mathematics and computer science.The factorial of a non-negative integer is the product of all positive integers less than or equal to that number. It is denoted by the symbol !. The factorial function is fundamental in combinatorics and probability theory.

PROGRAM:-

A] string Palindrome or not

```
str=input(("enter the string:-"))
print("your entered string is",str)
str1=""
for i in range(0,len(str)):
    a=str[i] str1=a+str1
if str==str1:
    print("given string",str,"is palindrome") else:
print("given string",str,"is not a palindrome")
```

B]Factorial of given number

```
fact=int(input("enter the number whose factorial is to be
```

```
found:-")) a=fact
for i in range(1,fact):
    fact=fact*i
print("factorial of",a,"is",fact)
```

OUTPUT:-

A]

```
Python 3.12.1 (tags/v3.12.1:2305ca5, Dec  7 2023, 22:03:25) [MSC v.1937 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

= RESTART: C:/Users/HP/Desktop/python/stringrev.py
enter the string:-madam
your entered string is madam
given string madam is palindrome
```

B]


```
Python 3.12.1 (tags/v3.12.1:2305ca5, Dec  7 2023, 22:03:25) [MSC v.1937 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

= RESTART: C:/Users/HP/Desktop/python/factorial.py
enter the number whose factorial is to be found:-6
factorial of 6 is 720
```

THEORY:-

Python's list is a flexible, versatile, powerful, and popular built-in data type. It allows you to create variable-length and mutable sequences of objects. In a list, you can store objects of any type. You can also mix objects of different types within the same list, although list elements often share the same type.

PROGRAM:-

```
mylist=[]
n=int(input("enter the size of list:-"))
print("enter the elementss of list:-")
for i in range(0,n):
    ele=int(input())
    mylist.append(ele)
print("the list is:-",mylist)
print("1.create list of odd elements\n2.create list of even elements\n3.merge the two lists\n4.sort the two lists\n5.Update first element of list with X value\n6.delete the middle element of the list\n7.Find the min and max froM
```

```
the list\n8. Add N names into the existing number list and check if whether python name is present or not\n9.press 9 for exit")
  while True:
    x=int(input("enter your choice:-"))
    if x==1:
      oddlist=[i for i in mylist if i%2!=0]
      print(oddlist)
    elif x==2:
      evenlist=[i for i in mylist if i%2==0]
      print(evenlist)
    elif x==3:
      list1=[]
      list2=[]
      list3=[]
      lim1=int(input("enter the limit of the first list:-"))
      print("enter the elements of first list:-")
      for i in range(0,lim1):
        ele=int(input())
        list1.append(ele)
      lim2=int(input("enter the limit of second list:-"))
      print("enter the elements of the second list:-")
      for i in range(0,lim2):
        ele=int(input())
        list2.append(ele)
      list3=list1+list2
      print("the merged list is:-",list3)
```

```
    elif x==4:
        list1=[]
        list2=[]
        list3=[]
        lim1=int(input("enter the limit of the first list:-"))
        print("enter the elements of first list:-")
        for i in range(0,lim1):
            ele=int(input())
            list1.append(ele)
        lim2=int(input("enter the limit of second list:-"))
        print("enter the elements of second list:-")
        for i in range(0,lim2):
            ele=int(input())
            list2.append(ele)
        list3=list1+list2
        list3.sort()
        print("the sorted list is:-",list3)
    elif x==5:
        a=int(input("enter value which is to be replaced with first element of list:-
"))
        print("list before replacing:-",mylist)
        mylist[0]=a
        print("list after replacing:-",mylist)
    elif x==6:
        if len(mylist)%2==0:
            mid=len(mylist)//2
```

```
    else:
        mid=len(mylist)//2
    print("list before deleting middle element:-",mylist)
    mylist.pop(mid)
    print("list after deleting middle element:-",mylist)
  elif x==7:
    minimum=min(mylist)
    maximum=max(mylist)
    print("minimum element of list is:-",minimum,"\nmax element of list:-
",maximum)
  elif x==8:
    lim=int(input("enter the number of elements to be inserted:-"))
    for i in range(0,lim):
        ele=input()
        mylist.append(ele)
    for i in range(0,len(mylist)):
        if mylist[i]=='python':
            flag=1
        else:
            flag=0
    if flag==1:
        print("python is present in the list")
    else:
        print("python is not present in the list")
  elif x==9:
    break
```

```
else:
    print("invalid option enter valid option")
```

OUTPUT:-

```
Python 3.12.1 (tags/v3.12.1:2305ca5, Dec  7 2023, 22:03:25) [MSC v.1937 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

= RESTART: C:\Users\HP\Desktop\python\list.py
enter the size of list:-5
enter the elementss of list:-
1
2
3
4
5
the list is:- [1, 2, 3, 4, 5]
1.create list of odd elements
2.create list of even elements
3.merge the two lists
4.sort the two lists
5.Update first element of list  with X value
6.delete the middle element of the list
7.Find the min and max from the list
8. Add N names into the existing number list and check if whether python name is present or not
9.press 9 for exit
enter your choice:-1
[1, 3, 5]
enter your choice:-2
[2, 4]
enter your choice:-3
enter the limit of the first list:-2
enter the elements of first list:-
47
69
enter the limit of second list:-2
enter the elements of the second list:-
13
68
the merged list is:- [47, 69, 13, 68]
enter your choice:-4
enter the limit of the first list:-2
enter the elements of first list:-
35
58
enter the limit of second list:-2
enter the elements of second list:-
46
79
the sorted list is:- [35, 46, 58, 79]
```

```
enter your choice:-5
enter value which is to be replaced with first element of list:-10
list before replacing:- [1, 2, 3, 4, 5]
list after replacing:- [10, 2, 3, 4, 5]
enter your choice:-6
list before deleting middle element:- [10, 2, 3, 4, 5]
list after deleting middle element:- [10, 2, 4, 5]
enter your choice:-7
minimum element of list is:- 2
max element of list:- 10
enter your choice:-8
enter the number of elements to be inserted:-3
suresh
ramesh
python
python is present in the list
enter your choice:-9
```

THEORY:-

Python tuples are a type of data structure that is very similar to lists. The main difference between the two is that tuples are immutable, meaning they cannot be changed once they are created. This makes them ideal for storing data that should not be modified, such as database records.

PROGRAM:-

```
names=()
roll_number=()
maths=()
science=()
english=()
print("1.To add information of N nuber of students(Name,Roll number,3 subject marks)\n\n2.To display student's roll number and marks whose name is 'python'\n\n3.To perform nested tuples and Sort nested tuple by name.\n\n4.press(4)for exit")
while True:
   x=int(input("enter your choice:-"))
   if x==1:
      lim=int(input("enter the number of students:-"))
      print("enter the name of students:-")
      for i in range(0,lim):
         ele=input()
         names=names+(ele,)
      print("enter roll number of students:-")
      for i in range(0,lim):
         ele=int(input())
         roll_number=roll_number+(ele,)
      print("enter the marks of maths of",lim,"students")
      for i in range(0,lim):
         ele=int(input())
         maths=maths+(ele,)
      print("enter the marks of science of",lim,"students")
      for i in range(0,lim):
         ele=int(input())
         science=science+(ele,)
      print("enter the marks of science of",lim,"students")
      for i in range(0,lim):
          ele=int(input())
          english=english+(ele,)
      print("NAME OF THE STUDENTS:-",names)
```

```
    print("ROLL NUMBER OF STUDENTS:-",roll_number)
    print("MATHEMATICS MARKS OF ABOVE STUDENTS:-",maths)
    print("SCIENCE MARKS OF ABOVE STUDENTS:-",science)
    print("ENGLISH MARKS OF ABOVE STUDENTS:-",english)
elif x==2:
    student_names=()
    student_number=()
    student_marks=()
    lim=int(input("enter the number of students:-"))
    print("enter the name of students:-")
    for i in range(0,lim):
        ele=input()
        student_names=student_names+(ele,)
    print("enter the roll number of students:-")
    for i in range(0,lim):
        ele=int(input())
        student_number=student_number+(ele,)
    print("enter total marks of students:-")
    for i in range(0,lim):
        ele=int(input())
        student_marks=student_marks+(ele,)
    for i in range(0,lim):
        if student_names[i]=="python":
            index=i
            flag=1
            break
        else:
            flag=0
    if flag==1:
        print("Student with name 'python' is present")
        print("Roll Number is:-",student_number[index])
        print("total marks are:-",student_marks[index])
    else:
        print("Student with name 'python' is not present")
elif x==3:
    nested_tupple=()
    tuple1=()
    lim1=int(input("enter the size of tupple:-"))
    for i in range(0,lim1):
        fruit_name=input("enter fruit names:-")
        fruit_colour=input("enter colour of fruits:-")
```

```
        fruit_quant=int(input("enter quantity of fruits:-"))
        tuple1=(fruit_name,fruit_colour,fruit_quant)
        nested_tupple=nested_tupple+(tuple1,)
    print("tupple before sorting:-",nested_tupple)
    print("tupple after sorting:-",sorted(nested_tupple))
elif x==4:
    break
else:
    print("invalid option enter valid option")
```

OUTPUT:-

```
Python 3.12.1 (tags/v3.12.1:2305ca5, Dec  7 2023, 22:03:25) [MSC v.1937 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

= RESTART: C:/Users/HP/Desktop/python/tupple.py
1.To add information of N nuber of students(Name,Roll number,3 subject marks)

2.To display student's roll number and marks whose name is 'python'

3.To perform nested tuples and Sort nested tuple by name.

4.press(4)for exit
enter your choice:-1
enter the number of students:-3
enter the name of students:-
ramesh
suresh
naresh
enter roll number of students:-
121
122
123
enter the marks of maths of 3 students
79
84
91
enter the marks of science of 3 students
69
48
96
enter the marks of science of 3 students
93
60
62
NAME OF THE STUDENTS:- ('ramesh ', 'suresh ', 'naresh')
ROLL NUMBER OF STUDENTS:- (121, 122, 123)
MATHEMATICS MARKS OF ABOVE STUDENTS:- (79, 84, 91)
SCIENCE MARKS OF ABOVE STUDENTS:- (69, 48, 96)
ENGLISH MARKS OF ABOVE STUDENTS:- (93, 60, 62)
```

```
enter your choice:-2
enter the number of students:-3
enter the name of students:-
python
java
CSS
enter the roll number of students:-
108
109
110
enter total marks of students:-
95
69
75
Student with name 'python' is present
Roll Number is:- 108
total marks are:- 95
enter your choice:-3
enter the size of tupple:-3
enter fruit names:-mango
enter colour of fruits:-yellow
enter quantity of fruits:-50
enter fruit names:-apple
enter colour of fruits:-red
enter quantity of fruits:-100
enter fruit names:-watermelon
enter colour of fruits:-green
enter quantity of fruits:-150
tupple before sorting:- (('mango', 'yellow', 50), ('apple', 'red', 100), ('watermelon', 'green', 150))
tupple after sorting:- [('apple', 'red', 100), ('mango', 'yellow', 50), ('watermelon', 'green', 150)]
enter your choice:-4
```

THEORY:-

- Sets are unordered.
- Set elements are unique. Duplicate elements are not allowed.
- A set itself may be modified, but the elements contained in the set must be of an immutable type.

PROGRAM:-

```
import sys
class Experiment:
   def stringinput(self):
      str1 = str(input("Enter the first string "))
      str2 = str(input("Enter the second string "))
      print("Strings after getting converted into set : ")
      str1_set = set(str1)
      str2_set = set(str2)
      print("The set string 1 is :" ,str1_set)
      print("The set string 2 is : " ,str2_set)

   def set_union(self):
      str1 = str(input("Enter the first string "))
      str2 = str(input("Enter the second string "))
      print("Strings after getting converted into set : ")
```

```
        str1_set = set(str1)
        str2_set = set(str2)
        print("The set string 1 is :" ,str1_set)
        print("The set string 2 is : " ,str2_set)
        print("The two set union is " , str1_set | str2_set )

    def set_intersection(self):
        str1 = str(input("Enter the first string "))
        str2 = str(input("Enter the second string "))
        print("Strings after getting converted into set : ")
        str1_set = set(str1)
        str2_set = set(str2)
        print("The set string 1 is :" ,str1_set)
        print("The set string 2 is : " ,str2_set)
        print("The two set intersection is " , str1_set & str2_set )

    def set_differnce(self):
        str1 = str(input("Enter the first string "))
        str2 = str(input("Enter the second string "))
        print("Strings after getting converted into set : ")
        str1_set = set(str1)
        str2_set = set(str2)
        print("The set string 1 is :" ,str1_set)
        print("The set string 2 is : " ,str2_set)
        print("The difference between set1 from set2 " , str1_set - str2_set )

    def set_symmetricdiffernce(self):
        str1 = str(input("Enter the first string "))
        str2 = str(input("Enter the second string "))
        print("Strings after getting converted into set : ")
        str1_set = set(str1)
        str2_set = set(str2)
        print("The set string 1 is :" ,str1_set)
        print("The set string 2 is : " ,str2_set)
        print("The two set's symmetric  difference is " , str1_set ^ str2_set )

obj1 = Experiment()
def call():
    while True:
        print("Press 1 : For Creating two strings ")
        print("Press 2 : For Displaying Set Union of two strings")
```

```
    print("Press 3 : For displaying Set intersection of two strings")
    print("Press 4 : For Illustrating Set difference between two strings")
    print("Press 5 : For dispalying symmetric difference of two strings")
    print("Press 6 : For exiting")
    choice = int(input("Enter the choice : "))
    if choice == 1 :
        obj1.stringinput()
    elif choice == 2:
        obj1.set_union()
    elif choice == 3 :
        obj1.set_intersection()
    elif choice == 4 :
        obj1.set_differnce()
    elif choice == 5 :
        obj1.set_symmetricdiffernce()
    elif choice == 6:
        sys.exit()

call()
```


OUTPUT:-

```
Python 3.12.1 (tags/v3.12.1:2305ca5, Dec  7 2023, 22:03:25) [MSC v.1937 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

= RESTART: C:/Users/HP/Desktop/python/set.py
Press 1 : For Creating two strings
Press 2 : For Displaying Set Union of two strings
Press 3 : For displaying Set intersection of two strings
Press 4 : For Illustrating Set difference between two strings
Press 5 : For dispalying symmetric difference of two strings
Press 6 : For exiting
Enter the choice : 1
Enter the first string anil
Enter the second string sunil
Strings after getting converted into set :
The set string 1 is : {'l', 'n', 'a', 'i'}
The set string 2 is :  {'l', 'i', 'u', 's', 'n'}
Press 1 : For Creating two strings
Press 2 : For Displaying Set Union of two strings
Press 3 : For displaying Set intersection of two strings
Press 4 : For Illustrating Set difference between two strings
Press 5 : For dispalying symmetric difference of two strings
Press 6 : For exiting
Enter the choice : 2
Enter the first string anil
Enter the second string sunil
Strings after getting converted into set :
The set string 1 is : {'l', 'n', 'a', 'i'}
The set string 2 is :  {'l', 'i', 'u', 's', 'n'}
The two set union is  {'l', 'a', 'i', 'u', 's', 'n'}
Press 1 : For Creating two strings
Press 2 : For Displaying Set Union of two strings
Press 3 : For displaying Set intersection of two strings
Press 4 : For Illustrating Set difference between two strings
Press 5 : For dispalying symmetric difference of two strings
Press 6 : For exiting
Enter the choice : 3
Enter the first string anil
Enter the second string sunil
Strings after getting converted into set :
The set string 1 is : {'l', 'n', 'a', 'i'}
The set string 2 is :  {'l', 'i', 'u', 's', 'n'}
The two set intersection is  {'l', 'n', 'i'}
```

```
Press 1 : For Creating two strings
Press 2 : For Displaying Set Union of two strings
Press 3 : For displaying Set intersection of two strings
Press 4 : For Illustrating Set difference between two strings
Press 5 : For dispalying symmetric difference of two strings
Press 6 : For exiting
Enter the choice : 4
Enter the first string anil
Enter the second string sunil
Strings after getting converted into set :
The set string 1 is : {'l', 'n', 'a', 'i'}
The set string 2 is :  {'l', 'i', 'u', 's', 'n'}
The difference between set1 from set2  {'a'}
Press 1 : For Creating two strings
Press 2 : For Displaying Set Union of two strings
Press 3 : For displaying Set intersection of two strings
Press 4 : For Illustrating Set difference between two strings
Press 5 : For dispalying symmetric difference of two strings
Press 6 : For exiting
Enter the choice : 5
Enter the first string anil
Enter the second string sunil
Strings after getting converted into set :
The set string 1 is : {'l', 'n', 'a', 'i'}
The set string 2 is :  {'l', 'i', 'u', 's', 'n'}
The two set's symmetric  difference is  {'u', 's', 'a'}
Press 1 : For Creating two strings
Press 2 : For Displaying Set Union of two strings
Press 3 : For displaying Set intersection of two strings
Press 4 : For Illustrating Set difference between two strings
Press 5 : For dispalying symmetric difference of two strings
Press 6 : For exiting
Enter the choice : 6
```

THEORY:-

Dictionaries and lists share the following characteristics:

- Both are mutable.
- Both are dynamic. They can grow and shrink as needed.
- Both can be nested. A list can contain another list. A dictionary can contain another dictionary. A dictionary can also contain a list, and vice versa.

Dictionaries differ from lists primarily in how elements are accessed:

- List elements are accessed by their position in the list, via indexing.
- Dictionary elements are accessed via keys.

PROGRAM:-

```
import sys
class Experiment:
   def create_dictionary(self):
      dictionary = {}
      lim = int(input("Enter the number of key:value pairs"))
      for i in range(0,lim):
         key=input("Enter the key Name ")
```

```
        value=input("Enter the value of the key ")
        dictionary[key]=value
      print("The dictionary is :\n" , dictionary)

  def exercise_on_dictionary(self):
        dictionary = {}
        lim = int(input("Enter the number of key:value pairs"))
        for i in range(0,lim):
          key=input("Enter the key ")
          value=input("Enter the value of the key ")
          dictionary[key]=value
        print("The dictionary is :\n" , dictionary)
        print("Concatenating another Key:Value pair")
        key = input("Enter the key  that is to be added :")
        value =input("Enter the value of the key ")
        dictionary[key]=value
        print("The dictionary is :\n" , dictionary)
        print("Deleting a particular Key:Value pair ")
        key = input("Enter the key of the key:value pair  that is to be deleted :
")
        dictionary.pop(key)
        print("The dictionary after deleting the key:valure pair " ,dictionary)

  def traversing_dictionary(self):
        dictionary = {}
        lim = int(input("Enter the number of key:value pairs"))
        for i in range(0,lim):
          key=input("Enter the key ")
          value=input("Enter the value of the key ")
          dictionary[key]=value
        print("The dictionary is :\n" , dictionary)
        found_value = input("Enter the value that is to be found : ")
        for i in dictionary:
            if dictionary[i] == found_value :
                print("The value is found ")
            elif(i == lim-1 and dictionary[i] != found_value ):
                print("Element not found ")

  def maplist_dictionary(self):
      dictionary = {}
```

```
        lim = int(input("Enter the number of key-value pairs in the dictionary:
"))
        for i in range(lim):
            key = input("Enter the key: ")
            value = []
            limlist = int(input("Enter the limit of list : "))
            print("Enter the values of list : ")
            for i in range(0,limlist):
               ele=input()
               value.append(ele)
            dictionary[key] = value
        print("The dictionary is : " , dictionary)

obj1 = Experiment()
def call():
    while True:
      print("Press 1 - For Creating a Dictionary  ")
      print("Press 2 - For Updating and Deleting aa key:value pair")
      print("Press 3 - For finding a key:value pair ")
      print("Press 4 - For mapping 'n' list in dictionary ")
      print("Press 5 - For exiting ")
      choice = int(input("Enter your choice"))
      if choice == 1:
        obj1.create_dictionary()
      elif choice == 2:
        obj1.exercise_on_dictionary()
      elif choice == 3:
        obj1.traversing_dictionary()
      elif choice == 4:
        obj1.maplist_dictionary()
      elif choice == 5:
         sys.exit()

call()
```

OUTPUT:-

```
Python 3.12.1 (tags/v3.12.1:2305ca5, Dec  7 2023, 22:03:25) [MSC v.1937 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.

= RESTART: C:/Users/HP/Desktop/python/dicitionary.py
Press 1 - For Creating a Dictionary
Press 2 - For Updating and Deleting aa key:value pair
Press 3 - For finding a key:value pair
Press 4 - For mapping 'n' list in dictionary
Press 5 - For exiting
Enter your choice1
Enter the number of key:value pairs2
Enter the key Name anil
Enter the value of the key chesterfield
Enter the key Name sunil
Enter the value of the key gavaskar
The dictionary is :
 {'anil': 'chesterfield', 'sunil': 'gavaskar'}
Press 1 - For Creating a Dictionary
Press 2 - For Updating and Deleting aa key:value pair
Press 3 - For finding a key:value pair
Press 4 - For mapping 'n' list in dictionary
Press 5 - For exiting
Enter your choice2
Enter the number of key:value pairs2
Enter the key 1
Enter the value of the key 2
Enter the key 3
Enter the value of the key 4
The dictionary is :
 {'1': '2', '3': '4'}
Concatenating another Key:Value pair
Enter the key  that is to be added :sachin
Enter the value of the key tendulkar
The dictionary is :
 {'1': '2', '3': '4', 'sachin': 'tendulkar'}
Deleting a particular Key:Value pair
Enter the key of the key:value pair  that is to be deleted : 1
The dictionary after deleting the key:valure pair  {'3': '4', 'sachin': 'tendulkar'}
Press 1 - For Creating a Dictionary
Press 2 - For Updating and Deleting aa key:value pair
Press 3 - For finding a key:value pair
Press 4 - For mapping 'n' list in dictionary
Press 5 - For exiting
Enter your choice3
Enter the number of key:value pairs2
Enter the key 1
Enter the value of the key 2
Enter the key 4
Enter the value of the key 8
The dictionary is :
 {'1': '2', '4': '8'}
Enter the value that is to be found : 4
Press 1 - For Creating a Dictionary
Press 2 - For Updating and Deleting aa key:value pair
Press 3 - For finding a key:value pair
Press 4 - For mapping 'n' list in dictionary
Press 5 - For exiting
Enter your choice4
Enter the number of key-value pairs in the dictionary: 2
Enter the key: 1
Enter the limit of list : 2
Enter the values of list :
45
79
Enter the key: 2
Enter the limit of list : 2
Enter the values of list :
68
90
The dictionary is :  {'1': ['45', '79'], '2': ['68', '90']}
Press 1 - For Creating a Dictionary
Press 2 - For Updating and Deleting aa key:value pair
Press 3 - For finding a key:value pair
Press 4 - For mapping 'n' list in dictionary
Press 5 - For exiting
Enter your choice5
```

CONCLUSION:-

i).To acknowledge basic terminologies of Python .

ii).We were able to acknowledge existing Python Syntaxes by executing basic programs

iii).We were able to comprehensively denominate various list built-in data of Python characteristics

iv).We were able to contemplate built-in data type tuple in Python

v).We were able to summon various sets characteristics in python

vi).We were able to stipulate operations on built-in data type dictionary in Python .