In [1]:

```
# Program to print factors of a given number
a=int(input("Enter a number: "))
print(f"The factors of {a} are:")
for i in range(1,a+1):
    d=a%i
    if d==0:
        print(i)
```

```
Enter a number: 12
The factors of 12 are:
1
2
3
4
6
12
```

In [3]:

```
'''Program to print numbers that are divisible by a given number upto a given range
using conditional statements'''
a=int(input("Enter a number: "))
list1=[12,54,65,39,102,339,221]
list2=[]
for i in list1:
    if i%a==0:
        list2.append(i)
    elif a==0:
        break
    elif a==1:
        continue
print(f"Numbers divisible by {a} are {list2}")
```

```
Enter a number: 13
Numbers divisible by 13 are [65, 39, 221]
```

In [4]:

```
# Program to create a tuple and copy the contents of the list
a=(5,10,7,4,15,3)
print(f"The list is: {list(a)}")
print(f"The tuple is: {a}")
```

```
The list is: [5, 10, 7, 4, 15, 3]
The tuple is: (5, 10, 7, 4, 15, 3)
```

In [5]:

```
# Program to delete elements from the tuple after displaying the contents
a=("apple","banana","cherry")
b=list(a)
print(f"The tuple is: {a}")
print(f"The list is: {b}")
del b[1]
print(f"The element deleted from the list: {b}")
```

```
The tuple is: ('apple', 'banana', 'cherry')
The list is: ['apple', 'banana', 'cherry']
The element deleted from the list: ['apple', 'cherry']
```

In [9]:

```
# Program ro print the first n elements on arrays using array module
import array
a=array.array('i',[1,2,3,4,5,6,7])
b=int(input("Enter the number of elements to be printed: "))
print(a[0:b])
```

```
Enter the number of elements to be printed: 3
array('i', [1, 2, 3])
```

In [15]:

```
# Program to print elements with given stride value using array module
def print_with_stride(array, stride):
    for i in range(0, len(array), stride):
        print(array[i], end=" ")
    print()

array = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
stride = 3

print("Original Array: ", end="")
print(array)
print("Elements with stride {}: ".format(stride), end="")
print_with_stride(array, stride)
```

```
Original Array: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
Elements with stride 3: 1 4 7 10
```

In [1]:

```
# Program to print elements in a reverse order in arrays using array module
import array
a=array.array('i',[1,2,3,4,5,6,7])
b=[]
for i in a:
    b.append(i)
print(b[::-1])
```

```
[7, 6, 5, 4, 3, 2, 1]
```

In [4]:

```
# Program to copy contents from one array to another array
import array as arr
a=arr.array('i',[1,2,3,4,5,6,7])
print("Elements of original array:")
for i in a:
    print(i,end=" ")
b=[None]*len(a)
for i in range(0,len(a)):
    b[i]=a[i]
print()
print("Elements of new array:")
for i in b:
    print(i,end=" ")
```

```
Elements of original array:
1 2 3 4 5 6 7
Elements of new array:
1 2 3 4 5 6 7
```

In [5]:

```
# Program to print factorial of given number without recursion
a=int(input("Enter a number: "))
fact=1
for i in range(1,a+1):
    fact=fact*i
if a>0:
    print(f"The factorial of {a} is: {fact}")
elif a==0:
    print("The factorial of 0 is 1")
elif a<0:
    print("Enter a psitive number")
```

```
Enter a number: 5
The factorial of 5 is: 120
```

In [6]:

```
# Program to print factorial of given number with recursion
a=int(input("Enter a number: "))
def fact(a):
    if a>=1:
        return a*fact(a-1)
    elif a==0:
        return 1
    elif a<0:
        print("Enter a positive number")
print(f"The factorial of {a} is: {fact(a)}")
```

```
Enter a number: 5
The factorial of 5 is: 120
```

In [7]:

```
# Program to handle multiple exceptions at a time
try:
    a=int(input("Enter the a value: "))
    b=int(input("Enter the b value: "))
    print(a/b)
except (ZeroDivisionError,ValueError):
    print("Enter a valid number")
    print("ZeroDivisionError")
```

```
Enter the a value: 5
Enter the b value: u
Enter a valid number
ZeroDivisionError
```

In [9]:

```
# Program to handle multiple exceptions one after another
try:
    a=int(input("Enter the a value: "))
    b=int(input("Enter the b value: "))
    print(a/b)
except ZeroDivisionError:
    print("ZeroDivisionError")
except ValueError:
    print("Enter a valid number")
```

```
Enter the a value: 5
Enter the b value: 0
ZeroDivisionError
```

In [12]:

```
# Program to handle unknown exceptions
a=int(input("Enter a number: "))
try:
    print(str(ab))
except:
    print("Error occured and handled")
```

```
Enter a number: 1
Error occured and handled
```

In [15]:

```
# Program to demonstrate else and finally block
a=[10,20,30,40,50]
try:
    print(a[5])
except IndexError:
    print("Index is out of bounds")
else:
    print("Job done")
finally:
    print("Task completed")
```

```
Index is out of bounds
Task completed
```

In [16]:

```
pip show numpy
```

```
Name: numpy
Version: 1.21.5
Summary: NumPy is the fundamental package for array computing with Python.
Home-page: https://www.numpy.org (https://www.numpy.org)
Author: Travis E. Oliphant et al.
Author-email:
License: BSD
Location: c:\users\subha\anaconda3\lib\site-packages
Requires:
Required-by: astropy, bkcharts, bokeh, Bottleneck, daal4py, datashader, data
shape, gensim, h5py, holoviews, hvplot, imagecodecs, imageio, matplotlib, mk
l-fft, mkl-random, numba, numexpr, pandas, patsy, pyerfa, PyWavelets, scikit
-image, scikit-learn, scipy, seaborn, statsmodels, tables, tifffile, xarray
Note: you may need to restart the kernel to use updated packages.
```

In [17]:

```
pip show pandas
```

```
Name: pandas
Version: 1.4.4
Summary: Powerful data structures for data analysis, time series, and statis
tics
Home-page: https://pandas.pydata.org (https://pandas.pydata.org)
Author: The Pandas Development Team
Author-email: pandas-dev@python.org
License: BSD-3-Clause
Location: c:\users\subha\anaconda3\lib\site-packages
Requires: numpy, python-dateutil, pytz
Required-by: datashader, holoviews, hvplot, seaborn, statsmodels, xarray
Note: you may need to restart the kernel to use updated packages.
```

In [18]:

```
pip show matplotlib
```

```
Name: matplotlib
Version: 3.5.2
Summary: Python plotting package
Home-page: https://matplotlib.org (https://matplotlib.org)
Author: John D. Hunter, Michael Droettboom
Author-email: matplotlib-users@python.org
License: PSF
Location: c:\users\subha\anaconda3\lib\site-packages
Requires: cycler, fonttools, kiwisolver, numpy, packaging, pillow, pyparsin
g, python-dateutil
Required-by: seaborn
Note: you may need to restart the kernel to use updated packages.
```

In [19]:

```
# Program illustrating all bitwise operators
a=10
b=4
print(f"Assuming a={a}({bin(a)} in binary) and b={b}({bin(b)} in binary)")
print(f"a&b={a&b}")
print(f"a|b={a|b}")
print(f"~a={~a}")
print(f"a^b={a^b}")
print(f"a<<2={bin(a<<2)}")
print(f"a>>1={bin(a>>1)}")
```

```
Assuming a=10(0b1010 in binary) and b=4(0b100 in binary)
a&b=0
a|b=14
~a=-11
a^b=14
a<<2=0b101000
a>>1=0b101
```

In [20]:

```
# Program to evaluate r//a+b*c-d/e
a=int(input("a: "))
b=int(input("b: "))
c=int(input("c: "))
d=int(input("d: "))
e=int(input("e: "))
r=int(input("r: "))
print(f"Enter value of a,b,c,d,e and r: {a},{b},{c},{d},{e},{r}")
print(f"The result of the expression is: {r//a+b*c-d/e}")
```

```
a: 2
b: 3
c: 4
d: 5
e: 6
r: 7
Enter value of a,b,c,d,e and r: 2,3,4,5,6,7
The result of the expression is: 14.166666666666666
```

In [21]:

```
# Program to evaluate r//((a+b)*((c-d)/e))
a=int(input("a: "))
b=int(input("b: "))
c=int(input("c: "))
d=int(input("d: "))
e=int(input("e: "))
r=int(input("r: "))
print(f"Enter value of a,b,c,d,e and r: {a},{b},{c},{d},{e},{r}")
print(f"The result of the expression is: {r//((a+b)*((c-d)/e))}")
```

```
a: 2
b: 3
c: 4
d: 5
e: 6
r: 7
Enter value of a,b,c,d,e and r: 2,3,4,5,6,7
The result of the expression is: -9.0
```

In [22]:

```
# Program to create a list without using list method
a=1
b=2
c=3
d=4
e=5
f='hi'
list1=[a,b,c,d,e,f]
print(list1)
```

```
[1, 2, 3, 4, 5, 'hi']
```

In [23]:

```
# Program to create a list with using list method
list1=list((1,2,3,4,5,'hi'))
print(list1)
```

```
[1, 2, 3, 4, 5, 'hi']
```

In [24]:

```
# Program demonstrating command line arguments
import sys
n=len(sys.argv)
print("Total arguments passed:", n)
print("\nName of python script:", sys.argv[0])
print("\nArguments passed:",end=" ")
for i in range(1,n):
    print(sys.argv[i],end=" ")
Sum=0
for i in range(1,n):
    Sum+=int(sys.argv[i])
print("\n\nResult:", Sum)
```

```
Total arguments passed: 3

Name of python script: C:\Users\subha\anaconda3\lib\site-packages\ipykernel_
launcher.py

Arguments passed: -f C:\Users\subha\AppData\Roaming\jupyter\runtime\kernel-a
52b0424-6764-46b2-8d5d-7188290d121a.json

---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
~\AppData\Local\Temp\ipykernel_3344\87020213.py in <module>
      8 Sum=0
      9 for i in range(1,n):
---> 10     Sum+=int(sys.argv[i])
     11 print("\n\nResult:", Sum)

ValueError: invalid literal for int() with base 10: '-f'
```

In [7]:

```
'''Program implementing the following the following operations on arrays
using numpy module:
a)Creating a 2X3 array and add elements
b)Convert the dimensions of the array into 3X2
c)Convert the dimensions of the array into 1X6
d)Copy the contents into another array'''


import numpy as np
a=np.array([[2,4,6],[7,8,9]])
print(a)
b=np.array([[2,6,0],[4,8,0]])
print(b.transpose())
c=np.array([[1],[2],[3],[4],[5],[6]]).reshape(1,6)
print(f"An 1-D array with 6 elements: {c}")
d=np.array([1,2,3,4,5,6])
e=np.array([0,0,0,0,0,0])
np.copyto(e,d)
print(f"Original array: {list(d)}")
print(f"Copied array: {list(e)}")
```

```
[[2 4 6]
 [7 8 9]]
[[2 4]
 [6 8]
 [0 0]]
An 1-D array with 6 elements: [[1 2 3 4 5 6]]
Original array: [1, 2, 3, 4, 5, 6]
Copied array: [1, 2, 3, 4, 5, 6]
```

In [26]:

```
# Program to print Fibonacci series without recursion
def fib(n):
    a=0
    b=1
    print("Fibonacci series:",a,b,end=" ")
    for i in range(2,n):
        c=a+b
        print(c,end=" ")
        a=b
        b=c
x=int(input("Enter the range: "))
fib(x)
```

```
Enter the range: 5
Fibonacci series: 0 1 1 2 3
```

In [27]:

```
# Program to print Fibonacci series with recursion
def fib(n):
    if n<=1:
        return 1
    else:
        return fib(n-1)+fib(n-2)
a=int(input("Enter the range: "))
print("0",end=" ")
for i in range(0,a-1):
    print(fib(i),end=" ")
```

```
Enter the range: 5
0 1 1 2 3
```

In [28]:

```
# Program to print values using format() method,%operator and format specifier
"""Format Method
Assuming"""
a="Python"
b=3.6
print(__doc__)
print("\nMt name is {},I'm {}".format(a,b))
print("\n%Operator and format specifier")
print("\nAssuming")
x=3.0
y=4.0
print("\nx=",x)
print("\ny=",y)
print("\n%.2f,%.2f"%(x,y))
```

```
Format Method
Assuming

Mt name is Python,I'm 3.6

%Operator and format specifier

Assuming

x= 3.0

y= 4.0

3.00,4.00
```

In [1]:

```
# Program to perform swapping of given two numbers using a temporary variable
x=int(input("x: "))
y=int(input("y: "))
print(f"Enter x,y values: {x},{y}")
print(f"Enter value of x before swapping is {x}")
print(f"Enter value of y before swapping is {y}")
z=x
x=y
y=z
print(f"Enter value of x after swapping is {x}")
print(f"Enter value of y after swapping is {y}")
```

```
x: 5
y: 10
Enter x,y values: 5,10
Enter value of x before swapping is 5
Enter value of y before swapping is 10
Enter value of x after swapping is 10
Enter value of y after swapping is 5
```

In [2]:

```
# Program to perform swapping of given two numbers without using a temporary variable
x=int(input("x: "))
y=int(input("y: "))
print(f"Enter x,y values: {x},{y}")
print(f"Enter value of x before swapping is {x}")
print(f"Enter value of y before swapping is {y}")
x,y=y,x
print(f"Enter value of x after swapping is {x}")
print(f"Enter value of y after swapping is {y}")
```

```
x: 5
y: 10
Enter x,y values: 5,10
Enter value of x before swapping is 5
Enter value of y before swapping is 10
Enter value of x after swapping is 10
Enter value of y after swapping is 5
```

In [4]:

```
# Program to whether a number is an Armstrong number or not
n=int(input("Enter a number: "))
a=0
b=n
while b>0:
    d=b%10
    a=a+d**3
    b=b//10
if n==a:
    print(f"{n} is an Armstrong number")
else:
    print(f"{n} is not an Armstrong number")
```

```
Enter a number: 153
153 is an Armstrong number
```

In [6]:

```
'''Program to demonstrate the following operations on a dictionary
a)Create a dictionary and display the contents
b)Create a dictionary having multiple values for the same key
c)Concatenate teo lists and convert it into a dictionary'''


d1={"brand":"Ford","model":"Mustang","year":1964}
print(f"The dict is: {d1}")
d2={"at":[3,10,15,20,36]}
print(f'Values of Key "at" are:\n{str(d2.get("at"))}')
keys=["Rash","Kil","Varsha"]
values=[1,4,5]
print(f"Original key list is: {keys}")
print(f"Original value list is: {values}")
d3={}
for key in keys:
    for value in values:
        d3[key]=value
        values.remove(value)
        break
print(f"Resultant dictionary is: {d3}")
```

```
The dict is: {'brand': 'Ford', 'model': 'Mustang', 'year': 1964}
Values of Key "at" are:
[3, 10, 15, 20, 36]
Original key list is: ['Rash', 'Kil', 'Varsha']
Original value list is: [1, 4, 5]
Resultant dictionary is: {'Rash': 1, 'Kil': 4, 'Varsha': 5}
```

In [16]:

```
# Program to vreate a new file and add the given text into the file
a=open('C:/Users/subha/OneDrive/Desktop/k.py','a')
a.write("This is Delhi\n")
a.write("This is Paris\n")
a.write("This is London today\n")
a.close()
a=open('C:/Users/subha/OneDrive/Desktop/k.py','r')
a.read()
```

Out[16]:

```
'This is Delhi\nThis is Paris\nThis is London today\n'
```

In [17]:

```
'''Program to add the contents into an existing file and display the contents of the file f
the specified position'''
b=open('C:/Users/subha/OneDrive/Desktop/k.py','a+')
b.write("  This is a sample file program  ")
print(b.tell())
b.seek(10)
b.read()
```

```
85
```

Out[17]:

```
'lhi\nThis is Paris\nThis is London today\n  This is a sample file program
'
```