

```
#Complex_Arithmetic
```

```
print("****Enter the first number****")
a=int(input("Real part of the first number :"))
b=int(input("Imaginary part of the second number :"))
print("\n")
print("****Enter the second number****")
c=int(input("Enter the real part of the second number :"))
d=int(input("Enter the imaginary part of the second number :"))
c1=complex(a,b)
c2=complex(c,d)
print("First number is :",c1)
print("Second number is :",c2)
print("\n")
print("Addition of thr given numbers =",c1+c2)
print("Subtraction of thr given numbers =",c1-c2)
print("Multiplication of thr given numbers =",c1*c2)
print("Division of thr given numbers =",c1/c2)
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```
#To print the name of student secured second lowest marks
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```
lst=[]
mark=[]
name=[]
n=int(input("Number of element:"))
for i in range (n):
    s=[]
    nam=input("Enter the name :")
    mar=int(input("Enter the marks :"))
    print("\n")
    s.append(nam)
    s.append(mar)
    lst.append(s)
    name.append(nam)
    mark.append(mar)
a=min(mark)
l1=[]
for i in range(n):
    if mark[i]==a:
        l1.append(i)
    else:
        pass
l2=[]
for i in range(len(l1)):
    l2.append(name[l1[i]])
print(lst)
print(min(l2))
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```
#Print the grade
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```
name=input("Enter the name of the student :")
roll=input("Enter the roll number of the student :")
branch=input("Specify the branch of the student :")
```

```

a=int(input("Enetr the marks in 1st subject out of 100 :"))
b=int(input("Enter the marks in 2nd subject out of 100 :"))
c=int(input("Enter the marks in 3rd subject out of 100 :"))
d=int(input("Enter the marks in 4th subject out of 100 :"))
e=int(input("Enter the marks in 5th subject out of 100 :"))
avg=(a+b+c+d+e)/5
print("\n\n")
print(name)
print(branch)
print(roll)
print("Percentage of the student is =",avg)
print("Grade of the students acoording to his marks :")
if avg>=90:
    print("A")
elif 90>avg>=75:
    print("B")
elif 75>avg>=60:
    print("C")
elif 60>avg>=33:
    print("D")
elif avg<33:
    print("Fail")

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#Fraction Arithmetic

```

from fractions import Fraction as ft
print("Enter the first number")
x1=int(input("Numerator of the first number :"))
x2=int(input("Denominator of the first number :"))
print("Enter the second number")
y1=int(input("Numerator of the second number :"))
y2=int(input("Denomintor of the second number :"))
f1=ft(x1,x2)
f2=ft(y1,y2)
print(f1)
print(f2)
print("Addition =",f1+f2)
print("Subtraction =",f1-f2)
print("Multiplication =",f1*f2)
print("Division =",f1/f2)

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#Print the index of substrings

```

print("Enter the string")
s=input()
c=input("Enter the substring to be search :")
lst=list(s.split())
print(lst)
l=len(lst)
for i in range(l):
    if (lst[i]==c):
        print("occur at index",i+1)
    else:

```

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pass
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```
#Search for the vowel
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```
n=int(input('Enter the number of words you want to enter :'))
l=list(map(str,input().strip().split()))[:n]
l1=[]
for j in l:
    count=0
    for i in j:
        if (i=='a') or (i=='e') or (i=='i') or (i=='o') or (i=='u') or (i=='A') or
(i=='E') or (i=='I') or (i=='O') or (i=='U'):
            count=count+1
    l1.append(count)
print(l1)
b=max(l1)
for i in range(n):
    if l1[i]==b:
        print(l[i])
    else:
        pass
```

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```
#Calculator
```

```
x=1
while(x>0):
    print("\nChoose the operation to be performed : ")
    print("1.Addition\n2.Subtraction\n3.Multiplication\n4.Division\n5.Exit")
    x=int(input())
    if (x==1):
        a=int(input("Enter the first number : "))
        b=int(input("Enter the second number : "))
        print("Addition = ",a+b)
    elif (x==2):
        a=int(input("Enter the first number : "))
        b=int(input("Enter the second number : "))
        print("Subtraction = ",a-b)
    elif (x==3):
        a=int(input("Enter the first number : "))
        b=int(input("Enter the second number : "))
        print("Multiplication = ",a*b)
    elif (x==4):
        a=int(input("Enter the first number : "))
        b=int(input("Enter the second number : "))
        print("Division = ",a/b)
    elif (x==5):
        break
    else:
        print("Incorrect choice")
    x=x+1
```

```

#Volume and surface area using function

def cylinder(r,h):
    print('Volume=',3.14*r*r*h)
    print('Surface area=',2*3.14*r*(h+r))
def cuboid(l,b,h):
    print('Volume=',l*b*h)
    print('Surface area=',2*((l*b)+(b*h)+(h*l)))
def sphere(r):
    print('Volume=',4/3*(3.14*r*r*r))
    print('Surface area=',4*3.14*r*r)
def cone(r,h,l):
    print('Volume=',1/3*(3.14*r*r*h))
    print('Surface area=',3.14*r*l)
print("Select your choice")
print(''1.Cylinder\n2.Cuboid\n3.Sphere\n4.Cone'')
n=int(input())
if n==1:
    r=float(input('Enter the radius of the cylinder :'))
    h=float(input('Enter the height of the cylinder :'))
    cylinder(r,h)
elif n==2:
    l=float(input('Enter the length :'))
    b=float(input('Enter the width :'))
    c=float(input('Enter the height :'))
    cuboid(l,b,h)
elif n==3:
    r=float(input('Enter the radius :'))
    sphere(r)
elif n==4:
    r=float(input('Enter the radius :'))
    h=float(input('Enter the height :'))
    l=float(input('Enter the slant height :'))
    cone(r,h,l)
else:
    print("Invalid choice")

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#Prime or Composite

```

```

def prime_or_not(n):
    c=0
    for i in range (2,n):
        if n%i==0:
            return("Not a prime number")
    return("Prime number")
n= int(input('Enter the number :'))
if n==1:
    print('Neither prime nor composite')
elif n==2:
    print('Prime number')
else:
    A = prime_or_not(n)
    print(A)

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#Late fine
```

```
from datetime import date as dt
print("Enter the first date : ")
x1=int(input("Enter the date : "))
x2=int(input("Enter the month : "))
x3=int(input("Enter the year : "))
print("Enter the second date : ")
y1=int(input("Enter the date : "))
y2=int(input("Enter the month : "))
y3=int(input("Enter the year : "))
d1=dt(x3,x2,x1)
d2=dt(y3,y2,y1)
a=(d2-d1).days
b=abs(a)
print("number of days are : ",b+1)
c=b*2
print("Total fine @ 2 rupes per day is : ",c)
```

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```
#Leap Year
```

```
n=int(input("Enter the year :"))
if n%4==0:
    if n%100==0:
        if n%400==0:
            print(n,"Leap Year")
        else:
            print(n,"Not a Leap year")
    else:
        print(n,"Leap Year")
else:
    print(n,"Not a leap year")
```

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```
#Total occurance of substring
```

```
count=0
n=int(input("Enter the number of element :"))
print("Enter the elements")
lst=list(map(int,input().strip().split()))[:n]
a=int(input("Enter the element to be search"))
for i in range (n):
    if(lst[i]==a):
        print("position of",a," is",i+1)
        count=count+1
    else:
        pass
print("Total occurance of",a,"is",count)
```

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```
#Maximum element in a list
```

```
n=int(input("Enter the number of elements to be entered :"))
lst=list(map(int,input().strip().split()))[:n]
max=0
min=0
print(lst)
max=lst[0]
min=lst[0]
for i in range (n-1):
    if lst[i]>max:
        max=lst[i]
    else:
        pass
print("Maximun valued element is :",max,"at the positon ",lst.index(max))
for i in range(n-1):
    if lst[i]<min:
        min=lst[i]
    else:
        pass
print("Minimum valued element is :",min,"at the positon ",lst.index(min))
```

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```
#Odd or Even
```

```
x=int(input("Enter the number :"))
if x%2==0:
    print(x,"is even number.")
else:
    print(x,"is odd number.")
```

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```
#Fractional Arithmetic
```

```
from fractions import Fraction as ft
print("Enter the first number")
x1=int(input("Numerator of the first number :"))
x2=int(input("Denominator of the first number :"))
print("Enter the second number")
y1=int(input("Numerator of the second number :"))
y2=int(input("Denomintor of the second number :"))
f1=ft(x1,x2)
f2=ft(y1,y2)
print(f1)
print(f2)
print("Addition =",f1+f2)
print("Subtraction =",f1-f2)
print("Multiplication =",f1*f2)
print("Division =",f1/f2)
```

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```
#Area, Perimeter, Volume of different shapes
```

```

x=1
while(x>0):
    print("\nChoose the operation to be performed : ")
    print("1.Area \n2.perimeter\n3.volume\n4.Exit")
    x=int(input())
    if (x==1):
        print("\nArea of-")
        print("1.Rectangle\n2.square\n3.Triangle\n4.Circle\n5.Parallelogram\n6.Exit")
        y=int(input())
        if (y==1):
            a=float(input("Enter the length : "))
            b=float(input("Enter the width : "))
            print("Area is = ",a*b)
        elif (y==2):
            a=float(input("Enter the side : "))
            print("Area is = ",a*a)
        elif (y==3):
            a=float(input("Enter the first side : "))
            b=float(input("Enter the second side : "))
            c=float(input("Enter the third side : "))
            s=(a+b+c)/2
            d=(s(s-a)(s-b)(s-c))**(0.5)
            print("Area is =",d)
        elif (y==4):
            a=float(input("Enter the radius : "))
            b=3.14*a*a
            print("Area is =",b)
        elif (y==5):
            a=float(input("Enter the base : "))
            b=float(input("Enter the height : "))
            print("Area is =",a*b)
        elif (y==6):
            break
        else:
            print("Incorrect choice")
            break
    elif (x==2):
        print("\nPerimeter of-")
        print("1.Rectangle\n2.square\n3.Triangle\n4.Circle\n5.Parallelogram\n")
        y=int(input())
        if (y==1):
            a=float(input("Enter the length : "))
            b=float(input("Enter the width : "))
            print("Perimeter is = ",2*(a+b))
        elif (y==2):
            a=float(input("Enter the side : "))
            print("Perimeter is = ",4*a)
        elif (y==3):
            a=float(input("Enter the first side : "))
            b=float(input("Enter the second side : "))
            c=float(input("Enter the third side : "))
            s=a+b+c
            print("Perimeter is =",s)
        elif (y==4):
            a=float(input("Enter the radius : "))
            b=2*3.14*a
            print("Circumference is =",b)
        elif (y==5):

```

```

        a=float(input("Enter the first side : "))
        b=float(input("Enter the second side : "))
        c=float(input("Enter the third side : "))
        d=float(input("Enter the fourth side : "))
        s=a+b+c+d
        print("Perimeter is =",s)
    elif (y==6):
        break
    else:
        print("Incorrect choice")
        break
elif (x==3):
    print("\nVolume of-")
    print("1.Cube\n2.Cuboid\n3.Cylinder\n4.Cone\n5.Sphere\n6.Hemisphere\n7.Exit")
    y=int(input())
    if (y==1):
        a=float(input("Enter side : "))
        print("Volume is =",a*a*a)
    elif (y==2):
        a=float(input("Enter the length : "))
        b=float(input("Enter the width : "))
        c=float(input("Enter the Height : "))
        print("Volume is =",a*b*c)
    elif (y==3):
        a=float(input("Enter the radius : "))
        b=float(input("Enter the height : "))
        s=2*3.14*a*b
        print("Volume is =",s)
    elif (y==4):
        a=float(input("Enter the radius : "))
        b=float(input("Enter the height : "))
        s=(3.14*a*a*b)/3
        print("Volume is =",s)
    elif (y==5):
        a=float(input("Enter the radius : "))
        s=(4*3.14*a*a*a)/3
        print("Perimeter is =",s)
    elif (y==6):
        a=float(input("Enter the radius : "))
        s=(2*3.14*a*a*a)/3
    elif (y==7):
        break
    else:
        print("Incorrect choice")
        break
elif (x==4):
    break
else:
    print("Incorrect choice")
x=x+1

```

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```

#Divisiblty by 3 and 7

```

n1=int(input("Enter the first number :"))
n2=int(input("Enter the second number :"))

```



```
l1=[]
l2=[]
for i in range (n1,n2+1):
    if i%21==0:
        l1.append(i)
    else:
        l2.append(i)
print("Numbers divisible by 3 and 7 in given range is :", l1)
print("Numbers not divisible by 3 and 7 in given range is :", l2)
```

=====

#Right angle triangle is possible or not

```
x=int(input("Enter the first side of the triangle :"))
y=int(input("Enter the second side of thr triangle :"))
z=int(input("Enter the third side of the triangle :"))
a=x*x
b=y*y
c=z*z
if (a==b+c or b==a+c or c==a+b):
    print("Right angle triangle is possible")
else:
    print("Right angle triangle is not possible")
```

=====

Program to check if a string is palindrome or not

```
my_str = 'aIbohPhoBiA'
my_str = my_str.casefold()
rev_str = reversed(my_str)
if list(my_str) == list(rev_str):
    print("The string is a palindrome.")
else:
    print("The string is not a palindrome.")
```

=====

define punctuation

```
punctuations = '!()-[]{};:\"\, <>./?@#$$%^&* _~'''
my_str = "Hello!!!, he said ---and went."
my_str = input("Enter a string: ")
no_punct = ""
for char in my_str:
    if char not in punctuations:
        no_punct = no_punct + char
print(no_punct)
```

=====

Program to sort alphabetically the words form a string provided by the user

```
my_str = "Hello this Is an Example With cased letters"
my_str = input("Enter a string: ")
words = [word.lower() for word in my_str.split()]
words.sort()
print("The sorted words are:")
for word in words:
    print(word)
```

```
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# Program to sort alphabetically the words form a string provided by the user
```

```
my_str = "Hello this Is an Example With cased letters"
my_str = input("Enter a string: ")
words = [word.lower() for word in my_str.split()]
words.sort()
print("The sorted words are:")
for word in words:
    print(word)
```

```
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# Program to perform different set operations like in mathematics
```

```
E = {0, 2, 4, 6, 8};
N = {1, 2, 3, 4, 5};
print("Union of E and N is",E | N)
print("Intersection of E and N is",E & N)
print("Difference of E and N is",E - N)
print("Symmetric difference of E and N is",E ^ N)
```

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# Program to count the number of each vowels
```

```
vowels = 'aeiou'
ip_str = 'Hello, have you tried our tutorial section yet?'
ip_str = ip_str.casefold()
count = {}.fromkeys(vowels,0)
for char in ip_str:
    if char in count:
        count[char] += 1
print(count)
```

```
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# Python program to mail merger
```

```
with open("names.txt", 'r', encoding='utf-8') as names_file:
    with open("body.txt", 'r', encoding='utf-8') as body_file:
        body = body_file.read()
        for name in names_file:
            mail = "Hello " + name.strip() + "\n" + body
            with open(name.strip()+".txt", 'w', encoding='utf-8') as mail_file:
                mail_file.write(mail)
```

```
=====  
=====  
  
#Pattern_1  
  
rows = int(input("Enter number of rows: "))  
  
for i in range(rows):  
    for j in range(i+1):  
        print("* ", end="")  
    print("\n")
```

```
=====  
=====  
  
#Dictionary  
  
dict_1 = {1: 'a', 2: 'b'}  
dict_2 = {2: 'c', 4: 'd'}  
  
print(dict_1 | dict_2)
```

```
=====  
=====  
  
#Pattern_2  
  
rows = int(input("Enter number of rows: "))  
  
for i in range(rows):  
    for j in range(i+1):  
        print(j+1, end=" ")  
    print("\n")
```

```
=====  
=====  
  
#Pattern_3  
  
rows = int(input("Enter number of rows: "))  
  
ascii_value = 65  
  
for i in range(rows):  
    for j in range(i+1):  
        alphabet = chr(ascii_value)  
        print(alphabet, end=" ")  
  
        ascii_value += 1  
    print("\n")
```

```
=====  
=====  
  
#Pattern_4
```

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

```
for i in range(rows, 0, -1):  
    for j in range(0, i):  
        print("* ", end=" ")
```

```
    print("\n")
```

```
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```

```
#Pattern_5
```

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

```
for i in range(rows, 0, -1):  
    for j in range(1, i+1):  
        print(j, end=" ")
```

```
    print("\n")
```

```
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```

```
#Pattern_6
```

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

```
k = 0
```

```
for i in range(1, rows+1):  
    for space in range(1, (rows-i)+1):  
        print(end=" ")
```

```
    while k!=(2*i-1):  
        print("* ", end="")  
        k += 1
```

```
    k = 0  
    print()
```

```
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```
#Pattern_7
```

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

```
k = 0  
count=0  
count1=0
```

```
for i in range(1, rows+1):  
    for space in range(1, (rows-i)+1):  
        print(" ", end="")  
        count+=1
```

```
    while k!=((2*i)-1):  
        if count<=rows-1:  
            print(i+k, end=" ")
```

```
        count+=1
    else:
        count1+=1
        print(i+k-(2*count1), end=" ")
    k += 1

count1 = count = k = 0
print()
```

=====

#Pattern_8

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

```
for i in range(rows, 1, -1):
    for space in range(0, rows-i):
        print(" ", end="")
    for j in range(i, 2*i-1):
        print("* ", end="")
    for j in range(1, i-1):
        print("* ", end="")
    print()
```

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