Python record

1)Add two numbers and print result

Code:

```
a=int(input("enter no a"))
b=int(input("enter no b"))
c=a+b
print(c)
```

Output:

```
enter no a3
enter no b5
8
```

2)Calculate area of triangle

Code:

```
a=float(input("enter base"))
b=float(input("enter height"))
area=1/2*a*b
print(area)
```

Output:

```
enter base2
enter height4
4.0
```

3)Square root of a number

Code:

```
import math
a=int(input("enter square no"))
b=math.sqrt(a)
print(b)
```

Output:

```
enter square no25
5.0
```

4)Solve a quadratic equation

Code:

```
import math
a=int(input("enter a"))
b=int(input("enter b"))
c=int(input("enter c"))
dsq=b**2-4*a*c
d=math.sqrt(dsq)
if (d<0):
    print("no real roots")
else:
    x=(-b+d)/2*a
    y=(-b-d)/2*a
    print(x,y)
```

Output:

```
enter a1
enter b-2
enter c1
1.0   1.0
```

5)Convert Fahrenheit to Celsius

Code:

```
a=int(input("enter temp in fahrenheit"))
temp_celsius=(a-32)*5/9
print(“The temperature in Celsius is”,temp_celsius)
```

Output:

```
enter a32
The temperature in Celsius is 0.0
```

6)Quotient and remainder and quotient after division

Code:

```
a=int(input("enter dividend"))
b=int(input("enter divisor"))
quotient=a/b
remainder=a%b
print("The quotient is",quotient)
print("The remainder is",remainder)
```

Output:

```
enter dividend32
enter divisor5
The quotient is 6.4
The remainder is 2
```

7)Swap two numbers using tuple assignment

Code:

```
a=int(input("enter first no"))
b=int(input("enter second no"))
a,b=b,a
print("The swapped nos are",a,b)
```

Output:

```
enter first no2
enter second no5
The swapped nos are 5 2
```

8)Average of three marks

Code:

```
a=int(input("enter mark1"))
b=int(input("enter mark2"))
c=int(input("enter mark3"))
avg=(a+b+c)/3
print("The average of three marks is",avg)
```

Output:

```
enter mark120
enter mark230
enter mark340
The average of three marks is 30.0
```

9)Calculate simple interest

Code:

```
a=int(input("Enter principal amount"))
b=int(input("Enter the rate of interest"))
c=int(input("Enter the time period"))
interest=a*b*c/100
print("The simple interest is",interest)
```

Output:

```
Enter principal amount4800
Enter the rate of interest9
Enter the time period8
The simple interest is 3456.0
```

10)Calculate net pay given basic pay,hr,da and deductions

Code:

```
a=int(input("enter basic pay"))
b=int(input("enter hra"))
c=int(input("enter da"))
d=int(input("enter deductions"))
netsalary=a+b+c-d
print("The net salary is",netsalary)
```

Output:

```
enter basic pay25000
enter hra2000
enter da300
enter deductions400
The net salary is 26900
```

1)Eligible to vote or not

Code:

```
age=int(input("enter age of candidate"))
if(age>=18):
    print("Eligible to vote")
else:
    print("Not eligible to vote")
```

Output:

```
enter age of candidate45
Eligible to vote
```

2)Odd or even

Code:

```
a=int(input("enter no"))
if(a%2==0):
    print("even")
else:
    print("odd")
```

Output:

```
enter no22
even
```

3)Largest of two numbers

Code:

```
a=int(input("enter no 1"))
b=int(input("enter no 2"))
if(a>b):
    print("a is the largest no")
else:
    print("b is the largest no")
```

Output:

```
enter no 123
enter no 245
b is the largest no
```

4)Uppercase or lowercase and vice versa

Code:

```
a=str(input("enter character"))
o=ord(a)
if (o<97):
    ord_new=o+32
else:
    ord_new=o-32
print("The converted character is",chr(ord_new))
```

Output:

```
enter characterA
The converted character is a
```

5)Leap year or not

Code:

```
a=int(input("enter year"))
if(a%4==0 and a%400==0 and a%100!=0):
    print("leap year")
else:
    print("not leap year")
```

Output:

```
enter year1900
not leap year

enter year2004
not leap year
```

6)Positive, negative or zero

Code:

```
a=int(input("enter no"))
if(a%2==0):
    a=a+1
elif(a%2!=0):
    a=a-1
else:
    a=0
print(a)
```

Output:

```
enter no43
42
```

7)Simple calculator

Code:

```
print("1.Add")
print("2.Subtract")
print("3.Multiply")
print("4.Divide")
oper_calc=int(input("enter operation"))
a=int(input("enter no a"))
b=int(input("enter no b"))
if(oper_calc==1):
    m=a+b
elif(oper_calc==2):
    m=a-b
elif(oper_calc==3):
    m=a*b
elif(oper_calc==4):
    m=a/b
else:
    print("invalid")
print(m)
```

Output:

```
1.Add
2.Subtract
3.Multiply
4.Divide
enter operation3
enter no a4
enter no b5
20
```

8)Grade based on the mark obtained by the student

Code:

```
a=int(input("enter mark"))
if(a>90):
    print("A grade")
elif(a>80):
    print("B grade")
elif(a>70):
    print("C grade")
elif(a>60):
    print("D grade")
else:
    print("E grade")
```

Output:

```
enter mark97
A grade
```

9)Largest of three numbers

Code:

```
a=int(input("enter no a"))
b=int(input("enter no b"))
c=int(input("enter no c"))
if(a>b and a>c):
    print("a is the largest no")
elif(b>c and b>a):
    print("b is the largest no")
else:
    print("c is the largest no")
```

Output:

```
enter no a34
enter no b45
enter no c67
c is the largest no
```

10)Lowercase, uppercase or digit

Code:

```
a=input("enter character")
o=ord(a)
if(o>64 and o<92):
    print("uppercase")
elif(o>96 and o<124):
    print("lowercase")
else:
    print("digit")
```

Output:

```
enter characterA
uppercase
```

11)Divisible by both 5 and 7

Code:

```
a=int(input("enter no"))

if(a%5==0 and a%7==0):
    print("It is divisible by 5 and 7")
else:
    print("It is not divisible by 5 and 7")
```

Output:

```
enter no35
It is divisible by 5 and 7
```

12)Equilateral, scalene or isoceles triangle

Code:

```
a=int(input("enter side a"))
b=int(input("enter side b"))
c=int(input("enter side c"))
if(a==b==c):
    print("equilateral")
elif(a==b or b==c or c==a):
    print("isoceles")
else:
    print("scalene")
```

Output:

```
enter side a4
enter side b4
enter side c4
equilateral
```

13)Right angled triangle

Code:

```
a=int(input("enter side a"))
b=int(input("enter side b"))
c=int(input("enter side hypotenuse"))
asquare=a*a
bsquare=b*b
csquare=c*c
if(csquare==asquare+bsquare):
    print("right angled")
else:
    print("not right angled")
```

Output:

```
enter side a3
enter side b4
enter side hypotenuse5
right angled
```

14) Data types:

Code:

a)

```
a=True

b=type(a)
if(b==str or b==bool or b==int or b==float):
    print(b)
    print("primitive data type")
else:
    print(b)
    print("compound data type")
```

Output:

```
<class 'bool'>
primitive data type
```

b)

```
a=[1,2,3,4]
b=type(a)
if(b==str or b==bool or b==int or b==float):
    print(b)
    print("primitive data type")
else:
    print(b)
    print("compound data type")
```

Output:

```
<class 'list'>

compound data type
```

Exercise 2b Conditions

1)Check whether a number is odd or even

Code:

```
a=int(input("enter no"))
if(a%2==0):
    print("even")
else:
    print("odd")
```

```
Output:
enter no22
even
```

2)Write a program to find largest of two numbers

Code:

```
a=int(input("enter no 1"))
b=int(input("enter no 2"))
if(a>b):
    print("a is the largest no")
else:
    print("b is the largest no")
```

```
Output:
enter no 123
enter no 245
b is the largest no
```

3)Obtain a character convert to uppercase or lowercase and vice versa

Code:

```
a=str(input("enter character"))
o=ord(a)
if (o<97):
    ord_new=o+32
else:
    ord_new=o-32
print("The converted character is",chr(ord_new))
```

```
Output:
enter characterA
The converted character is a
```

4)Write a program to find whether a number is divisible by both 5 and 7

Code:

```
a=int(input("enter no"))

if(a%5==0 and a%7==0):
    print("It is divisible by 5 and 7")
else:
    print("It is not divisible by 5 and 7")
```

```
Output:
enter no35
It is divisible by 5 and 7
```

5)Find the input year is leap or not

Code:

```
a=int(input("enter year"))
if(a%4==0 and a%400==0 and a%100!=0):
    print("leap year")
else:
    print("not leap year")
```

```
Output:
enter year1900
not leap year

enter year2004
not leap year
```

6)Write a program to input 3 sides of atriangle amd check if it is equilateral, scalene or isoceles

Code:

```
a=int(input("enter side a"))
b=int(input("enter side b"))
c=int(input("enter side c"))
if(a==b==c):
    print("equilateral")
elif(a==b or b==c or c==a):
    print("isoceles")
else:
    print("scalene")
```

```
Output:
enter side a4
enter side b4
enter side c4
equilateral
```

7)Write a program in python to input 3 sides of a triangle and check if it is right angled or not

Code:

```
a=int(input("enter side a"))
b=int(input("enter side b"))
c=int(input("enter side hypotenuse"))
asquare=a*a
bsquare=b*b
csquare=c*c
if(csquare==asquare+bsquare):
    print("right angled")
else:
    print("not right angled")
```

Output:

```
enter side a4

enter side b3

enter side c2

scalene
```

8)Read a number, check if it is positive,negative or zero. Increment if it is positive, decrement if it is negative

Code:

```
a=int(input("enter no"))
if(a%2==0):
    a=a+1
elif(a%2!=0):
    a=a-1
else:
    a=0
print(a)
```

Output:

```
enter no43
42
```

9)Create a simple calculator

Code:

```
print("1.Add")
print("2.Subtract")
print("3.Multiply")
print("4.Divide")
oper_calc=int(input("enter operation"))
a=int(input("enter no a"))
b=int(input("enter no b"))
```

```
if(oper_calc==1):
    m=a+b
elif(oper_calc==2):
    m=a-b
elif(oper_calc==3):
    m=a*b
elif(oper_calc==4):
    m=a/b
else:
    print("invalid")
print(m)
```

```
Output:
1.Add
2.Subtract
3.Multiply
4.Divide
enter operation3
enter no a4
enter no b5
20
```

10)Estimate the grade based on the mark obtained by the student

Code:

```
a=int(input("enter mark"))
if(a>90):
    print("A grade")
elif(a>80):
    print("B grade")
elif(a>70):
    print("C grade")
elif(a>60):
    print("D grade")
else:
    print("E grade")
```

```
Output:
enter mark97
A grade
```

11)Obtain a character, check if it is lowercase, uppercase or digit

Code:

```
a=input("enter character")
o=ord(a)
if(o>64 and o<92):
    print("uppercase")
elif(o>96 and o<124):
    print("lowercase")
else:
    print("digit")
```

```
Output:
enter characterA
uppercase
```

12)Find the largest of three numbers

Code:

```
a=int(input("enter no a"))
b=int(input("enter no b"))
c=int(input("enter no c"))
if(a>b and a>c):
    print("a is the largest no")
elif(b>c and b>a):
    print("b is the largest no")
else:
    print("c is the largest no")
```

```
Output:
enter no a34
enter no b45
enter no c67
c is the largest no
```

13)Obtain an input from the user and display the corresponding data types

Code:

```
a=input("enter data")
b=type(a)
if(b==str or b==bool or b==int or b==float):
    print(b)
    print("primitive data type")
else:
    print(b)
    print("compound data type")
```

Output:

1)Patterns using nested for loops

a)

Code:

```
n=int(input("enter no of rows"))
for i in range(n):
    for j in range(i):
        print("*",end="")
    print('')
for i in range(n,0,-1):
    for j in range(i):
        print("*",end="")
    print('')
```

Output:

```
enter no of rows5

*
**
***
****
*****
****
***
**
*
```

b)

Code:

```
n=int(input("enter no of rows"))
for i in range(1,n+1):
    for j in range(i,0,-1):
        print(j,end="")
    print("")
```

Output:

```
enter no of rows5
1
21
321
4321
54321
```

c)

Code:

```
rows=int(input("enter no of rows"))
for i in range (0,rows):
    coff=1
    for j in range(1,rows-i):
        print("",end="")
    for k in range (0,i+1):
        print("",coff,end="")
        coff=int(coff*(i-k)/(k+1))
    print()
```

output:

```
enter no of rows6

 1

 1 1

 1 2 1

 1 3 3 1

 1 4 6 4 1

 1 5 10 10 5 1
```

2)Reverse word given by user

Code:

```
word=input("enter word")
for i in range(len(word)-1,-1,-1):
    print(word[i],end="")
```

Output:

```
enter wordPython!

!nohtyP
```

3)Count the number of even and odd numbers from a series of numbers

Code:

```
numbers=(1,2,3,4,5,6,7,8,9)
count_even=0
count_odd=0
for i in numbers:
    if(i%2==0):
        count_even+=1
    else:
        count_odd+=1
print("Number of even numbers",count_even)
print("Number of odd numbers",count_odd)
```

Output:

```
Number of even numbers 4

Number of odd numbers 5
```

4)Write a python program that prints each element and the corresponding types from the following list

Code:

```
datalist=[1452,11,23,1+2j,True,'w3resource',(0,-
1),[5,12],{"class":'V',"section":'A'}]
for i in datalist:
    print(i)
    print(type(i))
```

Output:

```
1452

<class 'int'>

11

<class 'int'>

23

<class 'int'>

(1+2j)

<class 'complex'>

True

<class 'bool'>

w3resource

<class 'str'>

(0, -1)

<class 'tuple'>

[5, 12]

<class 'list'>

{'class': 'V', 'section': 'A'}

<class 'dict'>
```

5)Write a python program to print all numbers from 0 to 6 except 3 and 6

Code:

```
for i in range (0,7):
    if (i==3 or i==6):
        continue
    else:
        print(i)
```

Output:

0

1

2

4

5

6)Write a python program to iterate integers from 1 to 50. For multiple of three print “Fizz” instead of the number and for the multiples of five print “Buzz”. For numbers which are both multiples of three and five print “FizzBuzz”.

Code:

```
for i in range (1,51):
    if(i%3==0 and i%5!=0):
        print("Fizz")
    elif(i%5==0 and i%3!=0):
        print("Buzz")
    elif(i%3==0 and i%5==0):
        print("FizzBuzz")
    else:
        print(i)
```

Output:

1

2

Fizz

4

Buzz

Fizz

7

8

Fizz

Buzz

11

Fizz

13

14

FizzBuzz

16

17

Fizz

19

Buzz

Fizz

22

23

Fizz

Buzz

26

Fizz

28

29

FizzBuzz

31

32

Fizz

34

Buzz

Fizz

37

38

Fizz

Buzz

41

Fizz

43

44

FizzBuzz

46

47

Fizz

49

Buzz

7)Write a python program to find numbers between 100 and 400 where each digit is even

Code:

```
for i in range(100,401):
    n=i%10
    a=i//10
    b=a%10
    c=a//10
    if(n%2==0 and b%2==0 and c%2==0):
        print(i,",",end="")
```

Output:

```
200 ,202 ,204 ,206 ,208 ,220 ,222 ,224 ,226 ,228 ,240 ,242 ,244 ,246 ,248 ,260 ,
262 ,264 ,266 ,268 ,280 ,282 ,284 ,286 ,288 ,400 ,
```

8)Write a python program to create the multiplication table of a number

Code:

```
n=int(input("enter no to be multiplied"))
for i in range(1,11):
    print(i,"*",n,"=",i*n)
```

Output:

```
enter no to be multiplied5

1 * 5 = 5

2 * 5 = 10

3 * 5 = 15

4 * 5 = 20

5 * 5 = 25

6 * 5 = 30

7 * 5 = 35

8 * 5 = 40

9 * 5 = 45

10 * 5 = 50
```

9)Find sum of the series

a)1+1/2+1/3+…+1/N

Code:

```
n=int(input("enter no of terms"))
sum=0
for i in range(1,n+1):
    sum=sum+1/i
print(sum)
```

Output:

```
enter no of terms6

2.4499999999999997
```

b)1+x^2/2+x^3/3+…+x^n/n

Code:

```
n=int(input("enter no of terms"))
x=int(input("enter value for x"))
sum=1
for i in range(2,n+1):
    sum=sum+x**i/i
print(sum)
```

Output:

```
enter no of terms8

enter value for x3

1337.4035714285715
```

10) Classify if number is prime or composite

Code:

```
n=int(input("enter no"))
for i in range(2,n):
    if(n%i==0):
        result="composite"
        break
    else:
        result="prime"
print(result)
```

Output:

```
enter no23
prime
```

1)Exponentation without using ** operator

Code:

```
a=int(input("enter base"))
b=int(input("enter exponent"))
i=1
pow=1
while(i<=b):
    pow=pow*a
    i=i+1
print("computed exponent is",pow)
```

Output:

```
enter base7
enter exponent3
computed exponent is 343
```

2)Two digit numbers which are either divisible by 3 or 4

Code:

```
i=10
while(i<100):
    if(i%3==0 or i%4==0):
        print(i,",",end="")
    i=i+1
```

output:

```
12 ,15 ,16 ,18 ,20 ,21 ,24 ,27 ,28 ,30 ,32 ,33 ,36 ,39 ,40 ,42 ,44 ,45 ,48 ,51 ,52,
54 ,56 ,57 ,60 ,63 ,64 ,66 ,68 ,69 ,72 ,75,76 ,78 ,80 ,81 ,84 ,87 ,88 ,90 ,92 ,93 ,96
,99
```

3)Sum of all the digits in a number

Code:

```
n=int(input("enter no"))
sum=0
while(n>0):
    rem=n%10
    n=n//10
    sum=sum+rem
print(sum)
```

Output:

```
enter no3245

14
```

4)Division without using operators

Code:

```
num1=int(input("enter dividend"))
num2=int(input("enter divisor"))
quotient=0
sign=1
if(num1==0):
    print("quotient is 0")
if(num2==0):
    print("infinty")
if(num1<0):
    num1=-num1
    if(num2<0):
        num2=-num2
    else:
        sign=-1
if(num2<0):
    num2=-num2
    if(num1<0):
        num1=-num1
    else:
        sign=-1
while(num2<=num1):
    num1=num1-num2
    quotient=quotient+1
if (num1==0):
    remainder=0
else:
    remainder=(sign)*num1
if(sign==-1):
    quotient=-quotient
print("the quotient is",quotient)
print("the remainder is",remainder)
```

Output:

```
enter dividend67

enter divisor8

the quotient is 8

the remainder is 3
```

5)Palindrome number

Code:

```
num=int(input("enter no"))
temp=num
rev_num=0
while(num>0):
    rem=num%10
    num=num//10
    rev_num=rev_num*10+rem
if(temp==rev_num):
    print('palindrome')
else:
    print("not palindrome")
```

Output:

```
enter no4554

palindrome
```

6)Armstrong Number

Code:

```
a=int(input("enter a number"))
temp=a
sum=0
while(a>0):
    dig=a%10
    a=a//10
    cube=dig**3
    sum=sum+cube
if(temp==sum):
    print("armstrong")
else:
    print("not armstrong")
```

Output:

```
enter a number153
Armstrong
```

7)Compute GCD of two numbers
a) Euclidean method

Code:

```
m=int(input("enter a"))
n=int(input("enter b"))
if(m<n):
    m,n=n,m
while(m%n!=0):
    m,n=n,m%n
gcd=n
print("The gcd value is",gcd)
```

Output:

```
enter a18
enter b48
The gcd value is 6
```

b)Common factors method

Code:

```
m=int(input("enter num1"))
n=int(input("enter num2"))
i=1
if(m<n):
    m,n=n,m
while(i<=n):
    if(m%i==0 and n%i==0):
        gcd=i
    i=i+1
print(gcd)
```

Output:

```
enter num118
enter num248
6
```

8)Average and product of all numbers

Code:

```
sum=0
count=0
prdt=1
while(input("Enter any key or q to quit")!='q'):
    n=int(input("Enter number a"))
    sum=sum+n
    prdt=prdt*n
    count=count+1
avg=sum/count
print("The product is",prdt)
print("The average is",avg)
```

Output:

```
Enter any key or q to quiti
Enter number a7
Enter any key or q to quitt
Enter number a8
Enter any key or q to quith
Enter number a3
Enter any key or q to quitx
Enter number a5
Enter any key or q to quitq
The product is 840
The average is 5.75
```

9)Square root of a number using Newtons method

```
num=int(input("enter no"))
better=1
approx=num
while(better!=approx):
    approx=better
    better=(approx+num/approx)/2
print(better)
```

Output:

```
enter no25

5.0
```

1)Factors of a number

Code:

```
def factors(x):
    i=1
    for i in range(1,x+1):
        if(x%i==0):
            print(i)
a=int(input("enter the number"))
factors(a)
```

Output:

```
enter the number45

1

3

5

9

15

45
```

2)Decimal to binary

Code:

```
def bin(x):
    bin_list=''
    while (x>0):
        rem=x%2
        x=x//2
        bin_list=str(rem)+bin_list
    return(bin_list)

x=int(input("enter decimal no"))
print(bin(x))
```

Output:

```
enter decimal no56

111000
```

3)Perfect number

Code:

```
def perfect(a):
    sum=0
    for i in range(1,a):
        if(a%i==0):
            sum=sum+i
    if(sum==a):
        return True
    else:
        return False
a=int(input("enter no"))
if(perfect(a)==True):
    print("perfect")
else:
    print("not perfect")
```

4)Pythagorean triplets

Code:

```
def pythagorean(l,u):
    for i in range(l,u+1):
        for j in range(l+1,u+1):
            for k in range(l+2,u+1):
                if(i**2+j**2==k**2):
                    print(i,j,k)
l=int(input("enter lower lt"))
u=int(input("enter upper lt"))
pythagorean(l,u)
```

Output:

```
enter lower lt10

enter upper lt25

12 16 20

15 20 25

16 12 20

20 15 25
```

5)Fibonacci series

Code:

```
def fib(n):
    if(n==2 or n==1):
        return 1
    else:
        return fib(n-1)+fib(n-2)
a=int(input("Enter limit"))
print("The fibonacci series is")
for i in range(1,a+1):
    print(fib(i),end=””)
```

Output:

```
Enter limit6

The fibonacci series is

1 1 2 3 5 8
```

6)Powers of a number using recursion

Code:

```
def pow(x,y):
    if(y==0):
        return 1
    else:
        return x*pow(x,y-1)
x=int(input("enter base no"))
y=int(input("enter exponent no"))
print(pow(x,y))
```

Output:

```
enter base no6

enter exponent no3

216
```

7)Sum of sine and cosine series

```
def pow_fn(m,o):
    a=0
    while (o>=0):
        if (o==0):
            return a
        else:
            return a*pow_fn(m,o-1)
def fact_fn(a):
    while (a>0):
        if (a==1):
            return 1
        else:
            return a*fact_fn(a-1)
def sine_fn(x,n):
    sum=x
    pi=22/7
    y=x*pi/180
    sign=-1
    for i in range(1,n):
        sign=sign**i
        sum=sum+sign*y*pow(y,2*i+1)/fact_fn(2*i+1)
    return sum
def cosine_fn(x,n):
    sum=1
    pi=22/7
    y=x*pi/180
    sign=-1
    for i in range(1,n):
        sign=sign**i
        sum=sum+sign*y*pow(y,2*i)/fact_fn(2*i)
    return sum
x=int(input("enter angle in degrees"))
y=int(input("enter no of terms"))
print("1.Sine")
print("2.cosine")
z=int(input("enter operation"))
if (z==1):
    print(sine_fn(x,y))
elif(z==2):
    print(cosine_fn(x,y))
else:
    print("invalid")
```

Output:

a)

```
enter angle in degrees45
enter no of terms5
1.Sine
2.cosine
enter operation1
44.93847020584435
```

b)

```
enter angle in degrees30
enter no of terms5
1.Sine
2.cosine
enter operation2
0.9297976793634516
```

1)Occurences of substring and index number

Code:

```
def occurence(main_str,sub_str):
    count=0
    l1=len(main_str)
    l2=len(sub_str)
    for i in range(l1-l2+1):
        if main_str[i:i+l2]==sub_str:
            count=count+1
            print(i)
    return(count)
main_str=input("enter mainstring")
sub_str=input("enter substring")
print(occurence(main_str,sub_str))
```

Output:

```
enter mainstringshreyash

enter substringsh

0

6
```

2)Check if string is a palindrome

Code:

```
def palin(str1):
    str2=''
    for i in range(len(str1)-1,-1,-1):
        str2=str2+str1[i]
    if(str2==str1):
        return 'palindrome'
    else:
        return 'not palindrome'
str1=input("enter word")
print(palin(str1))
```

Output:

```
enter wordlevel

palindrome
```

3)Encrypt the word

```
word=input("enter word")
for i in range(0,len(word)):
    o=ord(word[i])+3
    c=chr(o)
    print(c,end="")
```

Output:

```
enter wordHelloWorld

KhoorZruog
```

4)Print fruit name and each letter in it

Code:

```
fruit=('banana','apple','orange','lemon','grapes')
for i in fruit:
    print(i)
    for j in i:
        print(j)
```

Output:

```
banana

b

a

n

a

n

a

apple

a

p

p
```

l

e

orange

o

r

a

n

g

e

lemon

l

e

m

o

n

grapes

g

r

a

p

e

s

5)Inbuilt functions

Code:

```
str='hellopython'
print("1. occurence of a substring")
print("2. first occurence from the end")
print("3.right justify a string")menu
print("4.capitalize first letter of a string")
print("5.check whether string is alphanumeric")
z=int(input("enter the operation"))
if(z==1):
    print(str.find('py',0,10))
elif(z==2):
    print(str.rfind('h'))
elif(z==3):
    print(str.rjust)
elif(z==4):
    print(str.capitalize())
else:
    print(str.isalnum())
```

Output:
a)

```
1. occurence of a substring
2. first occurence from the end
3.right justify a string
4.capitalize first letter of a string
5.check whether string is alphanumeric
enter the operation2
8
```

b)

```
1. occurence of a substring
2. first occurence from the end
3.right justify a string
4.capitalize first letter of a string
5.check whether string is alphanumeric
enter the operation5
True
```

6)String modules

Code:

```
import string
print("1.Hexadeimal or octadecimal numbers")
print("2.lowercase or uppercase")
n=int(input("select an operation"))
if(n==1):
    a=input("enter a letter")
    if(ord(a)>=97):
        print("lowercase")
    else:
        print("uppercase")
elif(n==2):
    print("The hexadecimal and octadecimal numbers are",string.hexdigits,"and",string
.octdigits)
else:
    print("invalid")
```

Output:

```
1.Hexadeimal or octadecimal numbers

2.lowercase or uppercase

select an operation2

The hexadecimal and octadecimal numbers are 0123456789abcdefABCDEF and 01234567



1.Hexadeimal or octadecimal numbers

2.lowercase or uppercase

select an operation1

enter a letterE

uppercase
```

1)Odd and even numbers list

Code:

```
n=int(input("Enter no of terms"))
for i in range(0,n):
    num=int(input("enter number"))
    l_num.append(num)
print("The list of numbers is",l_num)
num_odd=[]
num_even=[]
for j in range(0,len(l_num)):
    if(l_num[j]%2==0):
        num_even.append(l_num[j])
    else:
        num_odd.append(l_num[j])
print("The list of odd numbers is",num_odd)
print("The list of even numbers is",num_even)
```

Output:

```
Enter no of terms6

enter number3

enter number2

enter number8

enter number6

enter number9

enter number7

The list of numbers is [3, 2, 8, 6, 9, 7]

The list of odd numbers is [3, 9, 7]

The list of even numbers is [2, 8, 6]
```

2)Reverse a list without slicing operator

Code:

```
def reverse(l):
    list_num=[]
    for i in range(len(l)-1,-1,-1):
        list_num.append(l[i])
    return(list_num)
l1=['python',1,6,8,'hello']
print(reverse(l1))
```

Output:

```
['hello', 8, 6, 1, 'python']
```

3)Create a list of names and perform the following operations

Code:

```
stud_list=[]
for i in range(0,10):
    stud_name=input("enter student name")
    stud_list.append(stud_name)
print("The student list is",stud_list)
stud11=input("enter student name")
stud_list.append(stud11)
print("Updated list is",stud_list)
stud_search=input("enter student's name to be searched")
for j in range(0,len(stud_list)):
    if(stud_list[j]==stud_search):
        print("the name is found at",j)
    else:
        print("the name is not found")
stud_list.sort
```

Output:

```
enter student namesara

enter student nameshankar

enter student namevinay

enter student nameshravan

enter student namemanas

enter student namemohi

enter student namecharu

enter student namepurna

enter student namemeena

enter student nameayushi

The student list is ['sara', 'shankar', 'vinay', 'shravan', 'manas', 'mohi', 'charu', 'purna',
'meena', 'ayushi']

enter student namemadhuri

Updated list is ['sara', 'shankar', 'vinay', 'shravan', 'manas', 'mohi', 'charu', 'purna',
'meena', 'ayushi', 'madhuri']

enter student's name to be searchedmeena

the name is found at 8
```

4) A list of students registered for Python course. Perform the following operations one after another and print the output: (use inbuilt functions)
i. A new student registered for the course.
ii. Count the number of students registered for the course.
iii. Find the first and last student in lexicographical order.
iv. A new list of students registered for the course. Modify the name list.
v. Sort the name list.
vi. Assign register numbers for all the students registered.
vii. Now a new student has registered for the course. Insert the student name accordingly. (Mention the position)
viii. Search for a student.
ix. A student discontinues the course. Change the name list.
x. The same set of students register for Python exam. Generate the name list for the exam.

Code:

```
a=['sara','dhivya','ayswarya', 'karthick', 'shreya', 'sowmya', 'vijay', 'shruthi']

l=[]

k=0

count=0

a.append('sriram')

print("the number of students registered for this python course:",len(a))

a.sort()

print(a)

a.append("kavya")

a.append("arthi")

a.append("charu")

print(a)

for i in range(1,len(a)+1):

l.append(i)

a.sort()

b=a[0:1]+["saubagya"]+a[1:-1]

print(b)

b[1]=[]

if k in b:
```

```
if(k=="saubagya"):

count+=1

if(count==0):

print("name not found")

else:

print("name found")

del b[1]

exam=b

print("students attending the exam:",exam)
```

Output:

```
the number of students registered for this python course: 9

['ayswarya', 'dhivya', 'karthick', 'sara', 'shreya', 'shruthi', 'sowmya', 'sriram',
'vijay']

['ayswarya', 'dhivya', 'karthick', 'sara', 'shreya', 'shruthi', 'sowmya', 'sriram',
'vijay', 'kavya', 'arthi', 'charu']

['arthi', 'saubagya', 'ayswarya', 'charu', 'dhivya', 'karthick', 'kavya', 'sara',
'shreya', 'shruthi', 'sowmya', 'sriram']

name not found

students attending the exam: ['arthi', 'ayswarya', 'charu', 'dhivya', 'karthick',
'kavya', 'sara', 'shreya', 'shruthi', 'sowmya', 'sriram']
```

5) Create a list with n students who have passed in JEE . Create another list with m students

name who have passed NEET . write a program to perform the following functions

a.) Create list of students who have passed both the exams

b.) Print the students who have passed only JEE as a new list

c.) Print the students who have passed only NEET as a new list

d.) Print the students who have written at least one exam

Code:

```
 #jp=JEE pass #np=NEET pass #bp= both pass #onp=only NEET pass #ojp=only JEE pass

jp=["sara","hari","shravan","vishwa","santhosh"]
np=["sara","swetha","dhivya","nisha","vishwa"]
bp=[]
for i in range(len(jp)-1):
    for j in range(len(np)-1):
        if(jp[i]==np[j]):
            bp.append(jp[i])
del np[i]
del jp[j]
onp=np
ojp=jp
print(onp)
print(ojp)
print(bp)
aop=onp+ojp+bp
print(aop)
```

output:

```
['sara', 'swetha', 'dhivya', 'vishwa']

['sara', 'hari', 'shravan', 'santhosh']

['sara']

['sara', 'swetha', 'dhivya', 'vishwa', 'sara', 'hari', 'shravan', 'santhosh', 'sara']
```

6) Searching and sorting operations on a tuple

Code:

```
t=(1,4,5,7,8,6,3,2)
tl=list(t)
tl.sort()
print(tl)
n=int(input("enter no to be searched"))
if n in t1:
    print("number found")
else:
    print("Number not found")
```

Output:

```
 [1, 2, 3, 4, 5, 6, 7, 8]

enter no to be searched3

number found
```

1)Square of a matrix

Code:

```
def FUN(A):
    for i in range(0,len(A)):
        for j in range(0,len(A[0])):
            A[i][j]=(A[i][j])**2
    return A
A=[[1,2],[2,3]]
print("The new matrix is",FUN(A))
```

Output:

```
The new matrix is [[1, 4], [4, 9]]
```

2)Transpose of a matrix:

Code:

```
def transpose(A):
    result=[[0,0,0],[0,0,0]]
    for i in range(len(A)):
        for j in range(len(A[0])):
            result[j][i]=A[i][j]
    for r in result:
        print(r)
A=[[1,2],[2,3],[3,4]]
transpose(A)
```

Output:

```
[1, 2, 3]
[2, 3, 4]
```

3)Add and subtract two matrices

Code:

```
X = [[12,7,3],
    [4 ,5,6],
    [7 ,8,9]]
Y = [[5,8,1],
    [6,7,3],
    [4,5,9]]
result = [[0,0,0],
          [0,0,0],
          [0,0,0]]
def ADD(A,B):
    for i in range(len(X)):
        for j in range(len(X[0])):
            result[i][j] = X[i][j] + Y[i][j]
    return result

def SUB(A,B):
    for i in range(len(X)):
        for j in range(len(X[0])):
            result[i][j]=X[i][j]-Y[i][j]
    return result

print("The sum matrix is",ADD(X,Y))
print("The diff matrix is",SUB(X,Y))
```

output:

```
The sum matrix is [[17, 15, 4], [10, 12, 9], [11, 13, 18]]

The diff matrix is [[7, -1, 2], [-2, -2, 3], [3, 3, 0]]
```

4)Multiplication of 2 matrices

Code:

```
def MUL(X,Y):
    C=[[sum(a*b for a,b in zip(X_row,Y_col)) for Y_col in zip(*Y)] for X_row in X]
    return C
A=[[1,2],[2,3]]
B=[[1,2,3],[2,3,4]]
print("The resultant matrix is",MUL(A,B))
```

Output:

```
The resultant matrix is [[5, 8, 11], [8, 13, 18]]
```

1)Remove special characters and retain letter and numbers

Code:

```
str_raw=input("enter string with special characters")
str_new=[val for val in str_raw if val.isalnum()]
for i in str_new:
    print(i,end="")
```

Output:

```
enter string with special charactershello$#python77

hellopython77
```

2) Find odd and even numbers in a list and arrange them in ascending and descending order respectively

Code:

```
list_num=[1,34,56,3,11,54,76,46,43,8,0,9]
odd=[num for num in list_num if num%2!=0]
even=[num for num in list_num if num%2==0]
print("The list of odd numbers is",odd)
print("The list of even numbers is",even)
for i in range(0,len(odd)):
    for j in range(0,len(odd)-1):
        if(odd[j]>odd[j+1]):
            odd[j],odd[j+1]=odd[j+1],odd[j]
print("The sorted odd numbers list in ascending order is",odd)
for m in range(0,len(even)):
    for n in range(0,len(even)-1):
        if(even[n]<even[n+1]):
            even[n],even[n+1]=even[n+1],even[n]
print("The sorted even number list in descending order is",even)
```

Output:

```
The list of odd numbers is [1, 3, 11, 43, 9]

The list of even numbers is [34, 56, 54, 76, 46, 8, 0]

The sorted odd numbers list in ascending order is [1, 3, 9, 11, 43]

The sorted even number list in descending order is [76, 56, 54, 46, 34, 8, 0]
```

3)Addition of two matrices

Code:

```
X=[[1,2],[2,3]]
Y=[[2,3],[5,6]]
C=[[X[i][j] + Y[i][j]  for j in range(len(X[0]))] for i in range(len(X))]
print("The sum matrix is",C)
```

Output:

```
The sum matrix is [[3, 5], [7, 9]]
```

4)Multiply two matrices

Code:

```
def MUL(X,Y):
    C=[[sum(a*b for a,b in zip(X_row,Y_col)) for Y_col in zip(*Y)] for X_row in X]
    return C
A=[[1,2],[2,3]]
B=[[1,2,3],[2,3,4]]
print("The resultant matrix is",MUL(A,B))
```

Output:

```
The resultant matrix is [[5, 8, 11], [8, 13, 18]]
```

5)Bubble sort and selection sort

Code:

```
print("Bubble sorting")
a=[3,5,2,1,6,4]
for i in range(0,len(a)):
    for j in range (0,len(a)-1):
        if(a[j]>a[j+1]):
            a[j],a[j+1]=a[j+1],a[j]
print(a)
print("Selection sorting")
a=[2,5,4,6,1,3]
for i in range(len(a)):
    smallest=i
    for j in range(i+1,len(a)):
        if(a[j]<a[smallest]):
            smallest=j
    a[i],a[smallest]=a[smallest],a[i]
print(a)
```

Output:

```
Bubble sorting

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

Selection sorting

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

1)Concatenate 3 dictionaries and perform operations on them

Code:

```
dic1={1:10, 2:20}
dic2={3:30, 4:40}
dic3={5:50,6:60}
dic_add={}
dic_add.update(dic1)
dic_add.update(dic2)
dic_add.update(dic3)
print("The concatenated dictionary is",dic_add)
print("The keys of the dictioanry are",dic_add.keys())
print("The values of the dictionary are",dic_add.values())
print("The key-value pairs are",dic_add.items())
dic_add.setdefault(7)
print(dic_add)
```

Output:

```
The concatenated dictionary is {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}

The keys of the dictioanry are dict_keys([1, 2, 3, 4, 5, 6])

The values of the dictionary are dict_values([10, 20, 30, 40, 50, 60])

The key-value pairs are dict_items([(1, 10), (2, 20), (3, 30), (4, 40), (5, 50), (6,
60)])

{1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60, 7: None}
```

2) Generate and print a dictionary that contains a number (between 1 and n)
in the form (x, x*x)

Code:

```
n=int(input("Enter the number of terms of a dictionary"))
dict_sq={}
for i in range(1,n+1):
    dict_sq[i]=i**2
print(dict_sq)
```

Output:

```
Enter the number of terms of a dictionary5

{1: 1, 2: 4, 3: 9, 4: 16, 5: 25}
```

3)Sum of the values of a dictionary

Code :

```
n=int(input("enter no of students"))
dict_name={}
for i in range(1,n+1):
    name=input("enter name of student")
    mark=int(input("enter mark of student"))
    dict_name[name]=mark
print(dict_name)
print("The sum of the marks is",sum(dict_name.values()))
```

```
enter no of students5

enter name of studentsara

enter mark of student90

enter name of studentshreya

enter mark of student50

enter name of studentpriya

enter mark of student85

enter name of studentmeena

enter mark of student93

enter name of studentmadhuri

enter mark of student100

{'sara': 90, 'shreya': 50, 'pooja': 85, 'meena': 93, 'madhuri': 100}

The sum of the marks is 418
```

4)Merge two dictionaries

Code:

```
print("input data for d2")
for j in range(n):
    key2=input("Enter key element for d2")
    d2[key2]=int(input("Enter value"))
print(d2)
for i in d2:
    if i in d1:
        d1[i]=[d1[i],d2[i]]
```

```
    else:
        d1.setdefault(i,d2[i])
print("merged dictionary is",d1)
```

Output:

```
enter number of terms for d13

enter number of terms for d24

Input data for d1

Enter key element for d1a

enter value200

Enter key element for d1b

enter value400

Enter key element for d1c

enter value500

{'a': 200, 'b': 400, 'c': 500}

input data for d2

Enter key element for d2a

Enter value200

Enter key element for d2b

Enter value500

Enter key element for d2d

Enter value300

Enter key element for d2c

Enter value100

{'a': 200, 'b': 500, 'd': 300, 'c': 100}

merged dictionary is {'a': [200, 200], 'b': [400, 500], 'c': [500, 100], 'd': 300}
```

5)Combine two dictionaries by adding values of common keys

Code:

```
d1={'a':100,'b':200,'c':300}
d2={'a':300,'b':200,'d':400}
for i in d1:
    if i in d2:
        d2[i]+=d1[i]
    else:
        d2.setdefault(i,d1[i])
print("Counter(",d2,")")
```

Output:

```
Counter( {'a': 400, 'b': 400, 'd': 400, 'c': 300} )
```