 # Write a program to find input number is armstrong number
 # or not

 # What is armstrong number?
'''
An Armstrong number is a number that equals the sum of its digits, each raised to the power of the number of digits.
For example,
153 is an Armstrong number because 1^3 + 5^3 + 3^3 = 153
1634 1^4+6^4+3^4+4^4=1634'''

```
num=input("Enter any number ")
l=len(num)
num=int(num)
num1=num
s=0
while num>0:
    d=num%10
    s=s+(d**l)
    num=num//10

if num1==s:
    print(f'{num1} is armstrong number')
else:
    print(f'{num1} is not armstrong number')
```

Output

```
Enter any number 1634
1634 is armstrong number

Enter any number 370
370 is armstrong number

Enter any number 371
371 is armstrong number
```

Write a program to reverse input number

```
num=int(input("Enter any number "))
```

```
rev=0
while num>0:
    d=num%10
    rev=(rev*10)+d
    num=num//10

print(f'Reverse Number {rev}')
```

Output

```
Enter any number 123
Reverse Number 321

Enter any number 864
Reverse Number 468
```

Example:

```
# Write a program to find input number is pal or not

num=int(input("Input any number "))
num1=num
rev=0

while num>0:
    d=num%10
    rev=(rev*10)+d
    num=num//10

print(f'Original number {num1}')
print(f'Reverse number {rev}')
if num1==rev:
    print(f'{num1} is pal')
else:
    print(f'{num1} is not pal')
```

Output

```
Input any number 123
Original number 123
Reverse number 321
123 is not pal
```

Input any number 121
Original number 121
Reverse number 121
121 is pal

Example:
Write a program to convert decimal integer to binary integer

```
num=int(input("Enter any number "))
b=""

while num>0:
    d=num%2
    b=b+str(d)
    num=num//2

print("0b"+b[::-1])
```

Output
Enter any number 12
0b1100

Example:
Write a program to convert decimal integer to
hexadecimal integer

```
num=int(input("Enter any number "))
h=""
while num>0:
    d=num%16
    if d>=0 and d<=9:
        h=h+str(d)
    elif d==10:
        h=h+"a"
    elif d==11:
        h=h+"b"
    elif d==12:
        h=h+"c"
    elif d==13:
```

```
        h=h+"d"
    elif d==14:
        h=h+"e"
    elif d==15:
        h=h+"f"
    num=num//16

print("0x"+h[::-1])
```

Output

```
Enter any number 26
0x1a

Enter any number 255
0xff
```

Nested looping statements

Nested means within, defining looping control statement within looping control statement is called nested looping control statements.

1. Nested for loop
2. Nested while loop

Nested for loop

Defining for loop inside for loop is called nested for loop

Syntax:

```
for variable in iterable: # Outer Looping
   for variable in iterable: # Inner Looping
      statement-1
      statement-2
```

Example:

```
# Write a program to generate math tables from 1 to 10

for num in range(1,11): # 1 2 3 4 5 6 7 8 9 10 Outer loop
    for i in range(1,11): # inner loop
        p=num*i
```

```
        print(f'{num}x{i}={p}')
```

Output

```
1x1=1
1x2=2
1x3=3
1x4=4
1x5=5
1x6=6
1x7=7
1x8=8
1x9=9
1x10=10
2x1=2
2x2=4
2x3=6
2x4=8
2x5=10
2x6=12
2x7=14
2x8=16
2x9=18
2x10=20
….
```

 # Write a program to generate prime numbers 2 to 40

```
for num in range(2,41): # 2 3 4 5 6 7 8 .. 40
    c=0
    for i in range(1,num+1):
        if num%i==0:
            c=c+1
    if c==2:
        print(num)
```

Output

```
2
3
5
7
11
```

13
17
19
23
29
31
37