While loops

- A **while loop** is used when you want to **repeat a block of code multiple times as long as a condition is true**.

  Syntax:

        while (condition):

            # code to repeat

- The loop will **keep running** until the condition becomes **False**.
- If the condition is **always True**, it creates an **infinite loop** (runs forever) unless you use break.

Example 1: Simple Counter

        i = 1

        while i <= 5:

            print("Count:", i)

            i = i + 1

Explanation:

- Start with i = 1

- Condition: i <= 5

- Print value of i

- Increase i by 1

- Repeat until i becomes 6 (condition fails, loop stops)

Output:

        Count: 1

        Count: 2

        Count: 3

        Count: 4

        Count: 5

While loops problems

'''1. Grading System

Write a Python program that takes a student's marks as input.

If marks ≥ 90 → print "Grade A"

Else if marks ≥ 75 → print "Grade B"

Else if marks ≥ 50 → print "Grade C"

Else → print "Fail"'''

Code:

```python
while True:
    marks = int(input("Enter marks (negative to exit): "))
    if (marks < 0 or marks > 100):   # exit condition
        print("Exiting the program...")
        break


    if marks >= 90:
        print("Grade A")
    elif marks >= 75:
        print("Grade B")
    elif marks >= 50:
        print("Grade C")
    else:
        print("Fail")
```

output:

Enter marks (negative to exit): 90

Grade A

 Enter marks (negative to exit):

'''2. ATM Withdrawal Check

Ask the user for:

Account balance

Amount to withdraw

Check using nested if:

If balance ≥ withdrawal amount → further check if withdrawal amount is a multiple of 100

If yes → "Transaction Successful"

Else → "Enter amount in multiples of 100"

Else → "Insufficient Balance"'''

Code:

```python
while (True):
  balance=float(input("enter balance:"))
  withdraw=float(input("enter withdraw:"))

  if balance>=withdraw:
    if withdraw % 100 ==0:
      print("transaction done")
      balance=balance-withdraw
      print("balance:",balance)
      break
    else:
      print("enter the multiples of 100")
  else:
    print("insufficient balance")
```

output:

enter balance:10000

enter withdraw:5000

transaction done

balance: 5000.0

'''3. Triangle Type Checker

Take three sides of a triangle as input.

First check if it forms a valid triangle (a+b > c, b+c > a, a+c > b).

If valid, then check:

If all sides are equal → "Equilateral"

Else if two sides are equal → "Isosceles"

Else → "Scalene"

Else → "Not a Triangle"

'''

Code:

```python
while True:
    a=float(input("enter the side a:"))
    b=float(input("enter the side b:"))
    c=float(input("enter the side c:"))

    if (a+b>c) and (b+c>a) and (c+a>b):
        if a==b==c:
            print("Equilateral")
        elif a==b or b==c or c==a:
            print("Isosceles")
        else:
```

```python
        print("scalene")
    else:
        print("not a Triangle")
```

output:

enter the side a:5

enter the side b:5

enter the side c:5

Equilateral

enter the side a:

```python
'''4. Voting Eligibility

Ask the user for age and citizenship (Indian/Other).

If age ≥ 18

If citizenship is Indian → "Eligible to Vote"

Else → "Not Eligible (Non-Citizen)"

Else → "Not Eligible (Underage)"'''
```

Code:

```python
while True:
    age=int(input("enter the age:"))
    citizenship=input("enter the country:").lower()

    if age>=18 :
        print("your are eligible for vote")

        if citizenship=="india":
```

```python
        print("your are eligible for vote")
    else:
        print("Not Eligible ,Non-Citizen")
  else:
    print("Not Eligible Underage")
```

__output:__

enter the age:18

enter the country:india

your are eligible for vote

your are eligible for vote

enter the age:

'''5. Discount Calculator

Take the total bill amount as input.

If bill ≥ 5000

If bill ≥ 10000 → give 20% discount

Else → give 10% discount

Else

If bill ≥ 2000 → give 5% discount

Else → "No Discount'''

Code:

```python
while True:
   bill =float(input("enter the bill amount="))
   if bill >= 10000:
      discount=bill*0.2
      print("you earn 20% discount:",discount)
```

```python
elif 10000> bill >=5000:

    discount=bill*0.1

    print("you earn 10% discount:",discount)

elif 5000>bill>=2000:

    discount=bill*0.05

    print("your earn 5% discount:",discount)

else:

    print("no_discount")
```

output:

enter the bill amount=10000

you earn 20% discount: 2000.0

 enter the bill amount=