Ch-8 Flow of Control in Python

What is Flow of Control?

The order in which individual instructions, functions, and statements are executed or evaluated in a program

1. Use of Indentation

- Python uses **indentation (whitespace)** to define blocks of code.
- Indentation is **mandatory** in Python.

```
x = 10
if x > 5:
    print("x is greater than 5")  # indented block
```

2. Types of Control Flow

Type	Description
Sequential	Executes line-by-line in order
Conditional	Executes based on certain conditions (if, else)
Iterative	Repeats a block of code using loops (for, while)

3. Conditional Statements

a. if statement

```
x = 10
if x > 0:
    print("Positive")
```

b. if-else statement

```
x = -3
if x >= 0:
    print("Positive")
else:
    print("Negative")
```

c. if-elif-else statement

```
x = 0
if x > 0:
    print("Positive")
elif x == 0:
    print("Zero")
else:
    print("Negative")
```

Suggested Conditional Programs

1. **Absolute Value**

```
x = int(input("Enter a number: "))
if x < 0:
    x = -x
print("Absolute value:", x)
```

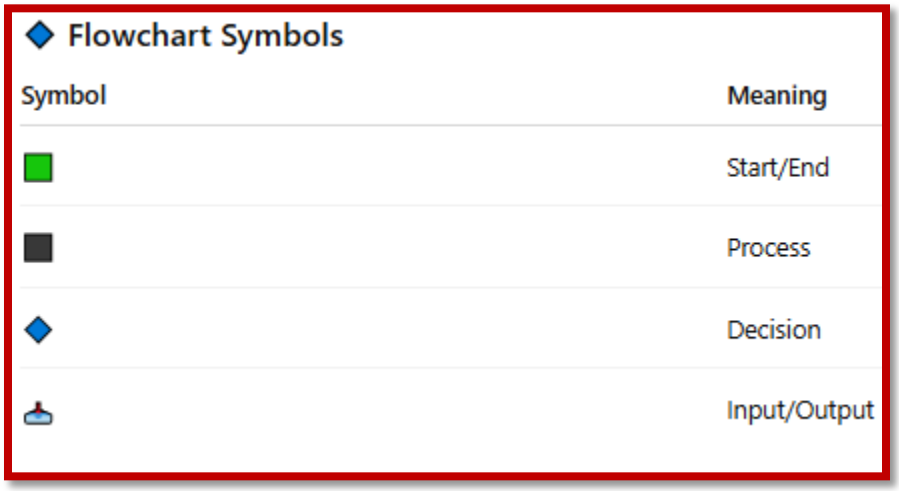
2. **Sort 3 Numbers**

```
a, b, c = 5, 3, 8
if a > b:
    a, b = b, a
if a > c:
```

```
    a, c = c, a
if b > c:
    b, c = c, b
print(a, b, c)
```

3. **Divisibility Check**

```
x = int(input("Enter a number: "))
if x % 5 == 0 and x % 11 == 0:
    print("Divisible by 5 and 11")
else:
    print("Not divisible")
```



4. Iterative Statements (Loops)

for loop with range()

```
for i in range(1, 6):
    print(i)
```

while loop

```
i = 1
while i <= 5:
    print(i)
    i += 1
```

break and continue

➢ **break: Exit loop immediately**

```
for i in range(1, 10):
    if i == 5:
        break
    print(i)
```

➢ **continue: Skip current iteration**

```
for i in range(1, 6):
    if i == 3:
        continue
    print(i)
```

Nested Loops

```
for i in range(1, 4):
    for j in range(1, 4):
        print(i, j)
```

Suggested Loop Programs

1. **Pattern Printing (Stars)**

```
for i in range(1, 6):
    print("*" * i)
```

2. **Summation of Series**

```
n = int(input("Enter n: "))
total = 0
for i in range(1, n+1):
    total += i
print("Sum =", total)
```

3. **Factorial of a Number**

```
n = int(input("Enter number: "))
fact = 1
for i in range(1, n+1):
    fact *= i
print("Factorial =", fact)
```