SNS COLLEGE OF ENGINEERING

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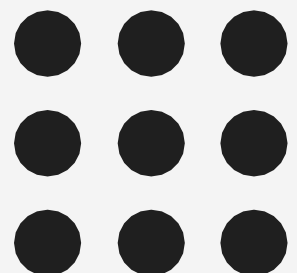**Accredited by NAAC-UGC with 'A' Grade**

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Department of Artificial Intelligence and Data Science

Course Name – Computational Thinking and Python Programming

I Year / I Semester

Unit 3-CONTROL FLOW, FUNCTIONS

CONDITIONALS

- **Conditional if**
- **Alternative if… else**
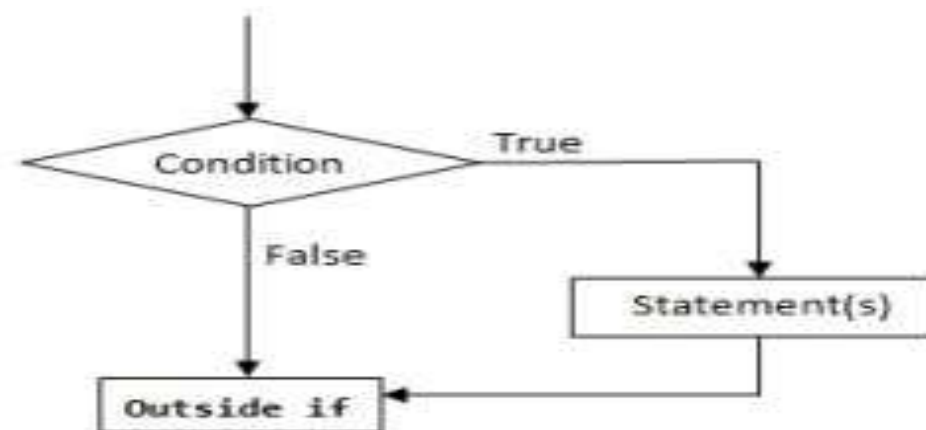- **Chained if…elif…else**
- **Nested if….else**

Conditional (if):

conditional (if) is used to test a condition, if the condition is true the statements inside if will be executed.
syntax:
if(condition 1):
Statement 1

Flowchart:

Example:
1. Program to provide flat rs 500, if the purchase amount is greater than 2000.
2. Program to provide bonus mark if the category is sports.

Program to provide flat rs 500, if the purchase amount is greater than 2000.
purchase=eval(input("enter your purchase amount"))
if(purchase>=2000):
purchase=purchase-500
print("amount to pay",purchase)

output
enter your purchase
amount
2500
amount to pay
2000
Program to provide bonus mark if the category is sports
m=eval(input("enter ur mark out of 100"))
c=input("enter ur categery G/S")
if(c=="S"):
m=m+5
print("mark is",m)

output
enter ur mark out of 100
85
enter ur categery G/S
S
mark is 90

Alternative (if-else)

In the alternative the condition must be true or false. In this **else** statement can be combined with **if** statement. The **else** statement contains the block of code that executes when the condition is false. If the condition is true statements inside the if get executed otherwise else part gets executed. The alternatives are called branches, because they are branches in the flow of execution.

syntax:

```
if(condition 1):
    Statement 1
else:
    Statement 2
```

Flowchart:
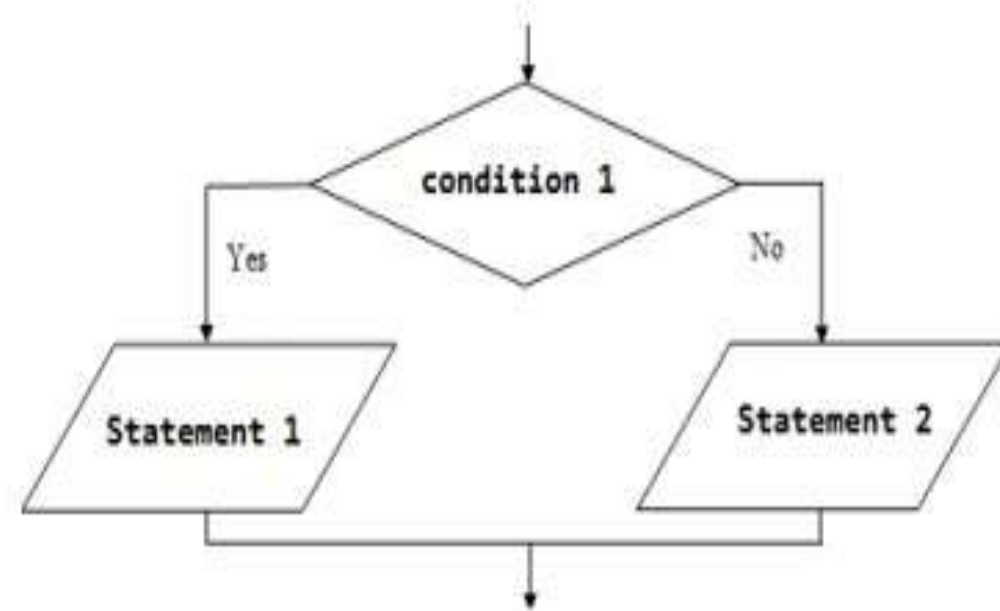
Examples:
1. odd or even number
2. positive or negative number
3. leap year or not
4. greatest of two numbers
5. eligibility for voting

Odd or even number

n=eval(input("enter a number"))
if(n%2==0):
print("even number")
else:
print("odd number")

Output

enter a number4
even number

leap year or not

y=eval(input("enter a yaer"))
if(y%4==0):
print("leap year")
else:
print("not leap year")

Output

enter a yaer2000
leap year

greatest of two numbers

a=eval(input("enter a value:"))
b=eval(input("enter b value:"))
if(a>b):
print("greatest:",a)
else:
print("greatest:",b)

Output

enter a value:4
enter b value:7
greatest: 7

eligibility for voting

age=eval(input("enter ur age:"))
if(age>=18):
print("you are eligible for vote")
else:
print("you are eligible for vote")

Output

enter ur age:78
you are eligible for vote

Chained conditionals(if-elif-else)

·   The elif is short for else if.

·   This is used to check more than one condition.

·   If the condition1 is False, it checks the condition2 of the elif block. If all the conditions are False, then the else part is executed.
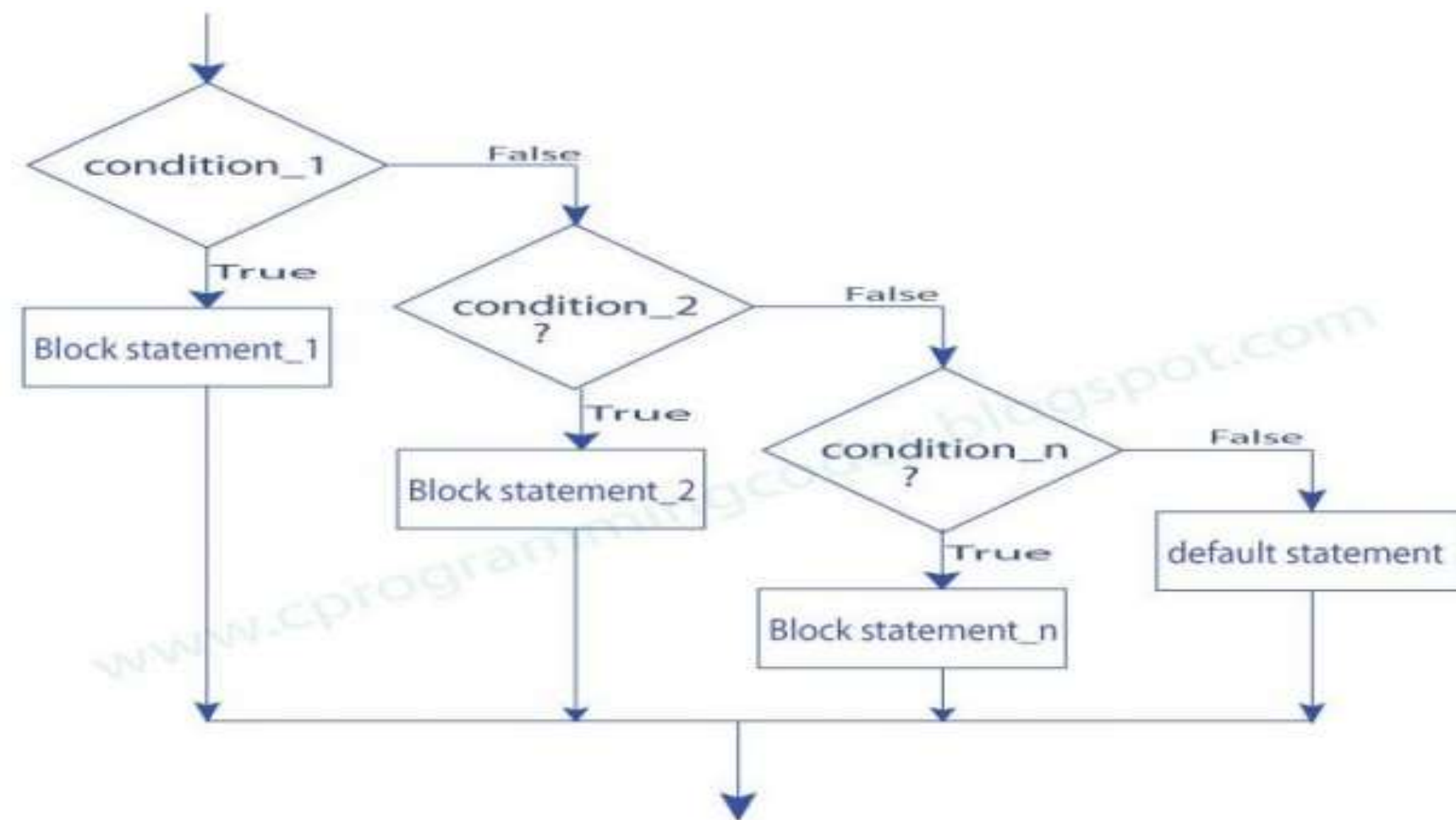
Among the several if...elif...else part, only one part is executed according to the condition.

• The if block can have only one else block. But it can have multiple elif blocks.

• The way to express a computation like that is a chained conditional.

syntax: **Flowchart:**

```
if(condition 1):
     statement 1
elif(condition 2):
     statement 2
elif(condition 3):
     statement 3
else:
     default statement
```

Example:
1. student mark system
2. traffic light system
3. compare two numbers
4. roots of quadratic equation

student mark system
```
mark=eval(input("enter ur mark:"))
if(mark>=90):
print("grade:S")
elif(mark>=80):
print("grade:A")
elif(mark>=70):
print("grade:B")
elif(mark>=50):
print("grade:C")
else:
print("fail")
```

Output
```
enter ur mark:78
grade:B
```

traffic light system
```
colour=input("enter colour of light:")
if(colour=="green"):
print("GO")
elif(colour=="yellow"):
print("GET READY")
else:
print("STOP")
```

Output
```
enter colour of light:green
GO
```

Roots of quadratic equation
```
a=eval(input("enter a value:"))
b=eval(input("enter b value:"))
c=eval(input("enter c value:"))
d=(b*b-4*a*c)
if(d==0):
print("same and real roots")
elif(d>0):
print("diffrent real roots")
else:
print("imaginagry roots")
```

output
```
enter a value:1
enter b value:0
enter c value:0
same and real roots
```

Nested conditionals

One conditional can also be nested within another. Any number of condition can be nested inside one another. In this, if the condition is true it checks another if condition1. If both the conditions are true statement1 get executed otherwise statement2 get execute. if the condition is false statement3 gets executed

Syntax:

```
if (condition):
        if(condition 1):
                statement 1
        else:
                statement 2
else:
        statement 3
```

Flowchart:
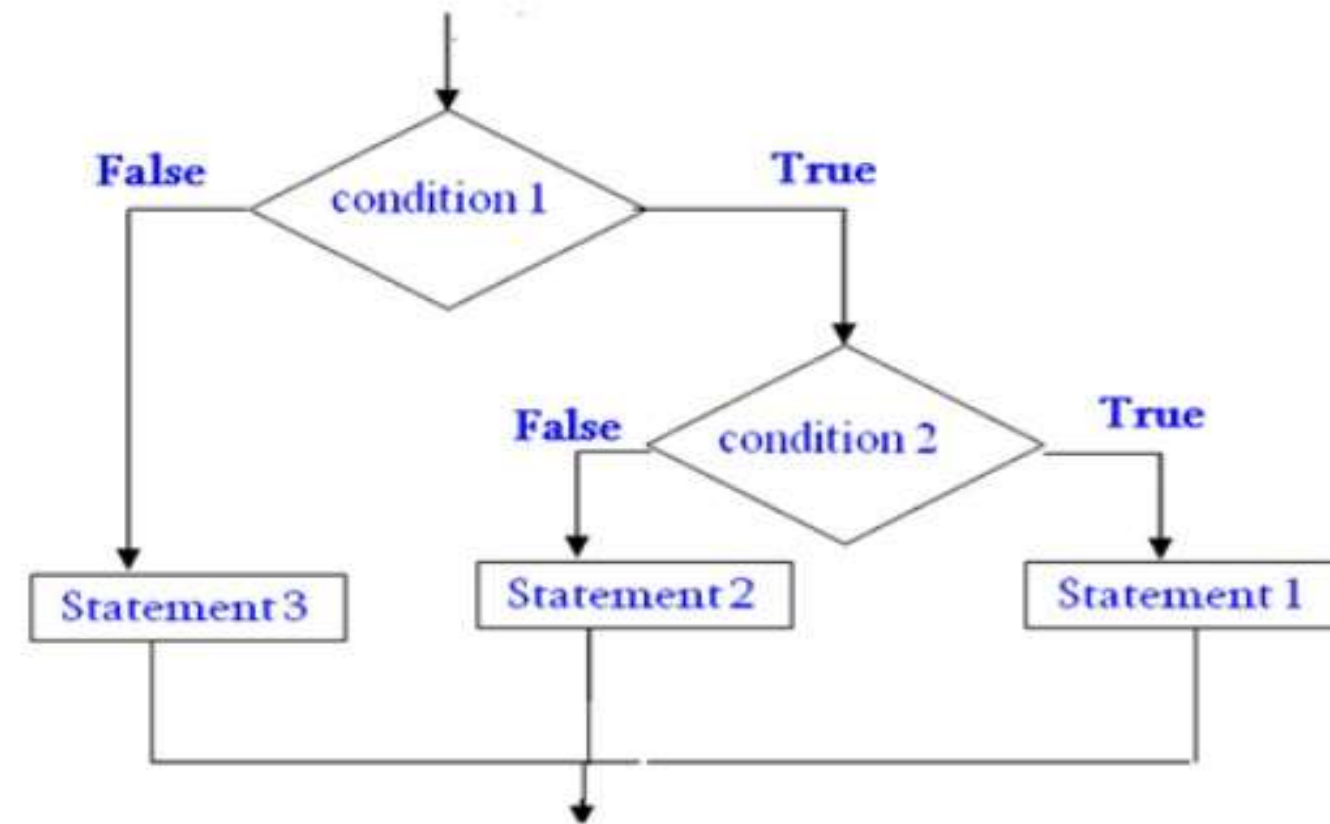
Exampe:
1. greatest of three numbers
2. positive negative or zero

greatest of three numbers
```
a=eval(input("enter the value of a"))
b=eval(input("enter the value of b"))
c=eval(input("enter the value of c"))
if(a>b):
if(a>c):
print("the greatest no is",a)
else:
print("the greatest no is",c)
else:
if(b>c):
print("the greatest no is",b)
else:
print("the greatest no is",c)
```

output
enter the value of a 9
enter the value of a 1
enter the value of a 8
the greatest no is 9

positive negative or zero
```
n=eval(input("enter the value of n:"))
if(n==0):
print("the number is zero")
else:
if(n>0):
print("the number is positive")
else:
print("the number is negative")
```

output
enter the value of n:-9
the number is negative