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Data Science

(Level-I)

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Session - 6

This session deals with

Conditional Statements

Types of Conditional Statements

Exercises

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Python – Conditional Structure

if, else & elif

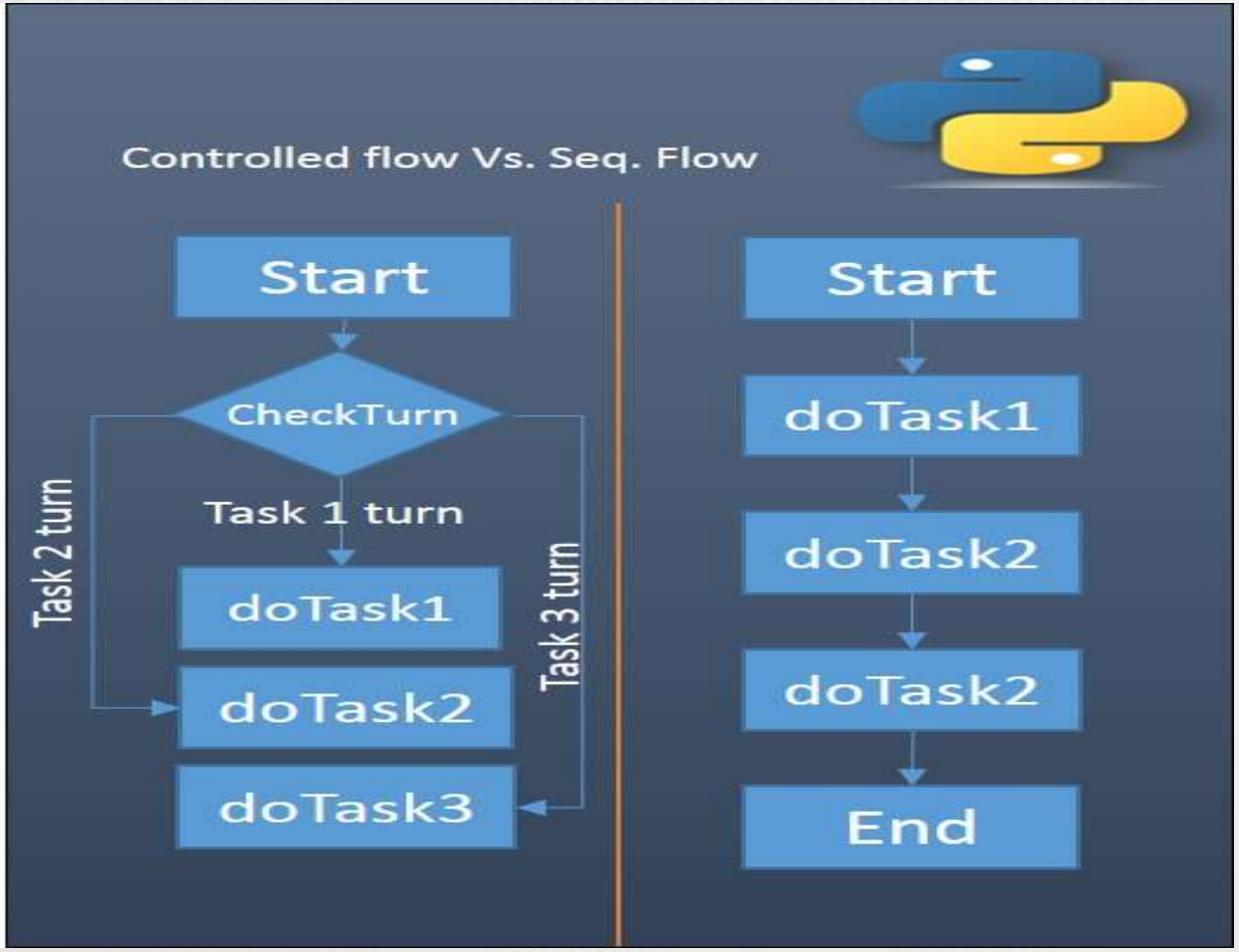
if statement in Python

- In Python, if Statement is used for decision making.
- It will run the body of code only when if statement is true.

Control flow statements

- It is very important to control the program execution because in real scenarios the situations are full of conditions.
- The first word is **control** that simply means controlling.
- Flow is just a way or sequence of program execution.
- By default every statement of program is executed one by one in an order they appear in a program code.
- When we combine the above two words we get **control flow,**
- That simply means controlling the flow of program execution to get desire behavior or result.

Flow of control



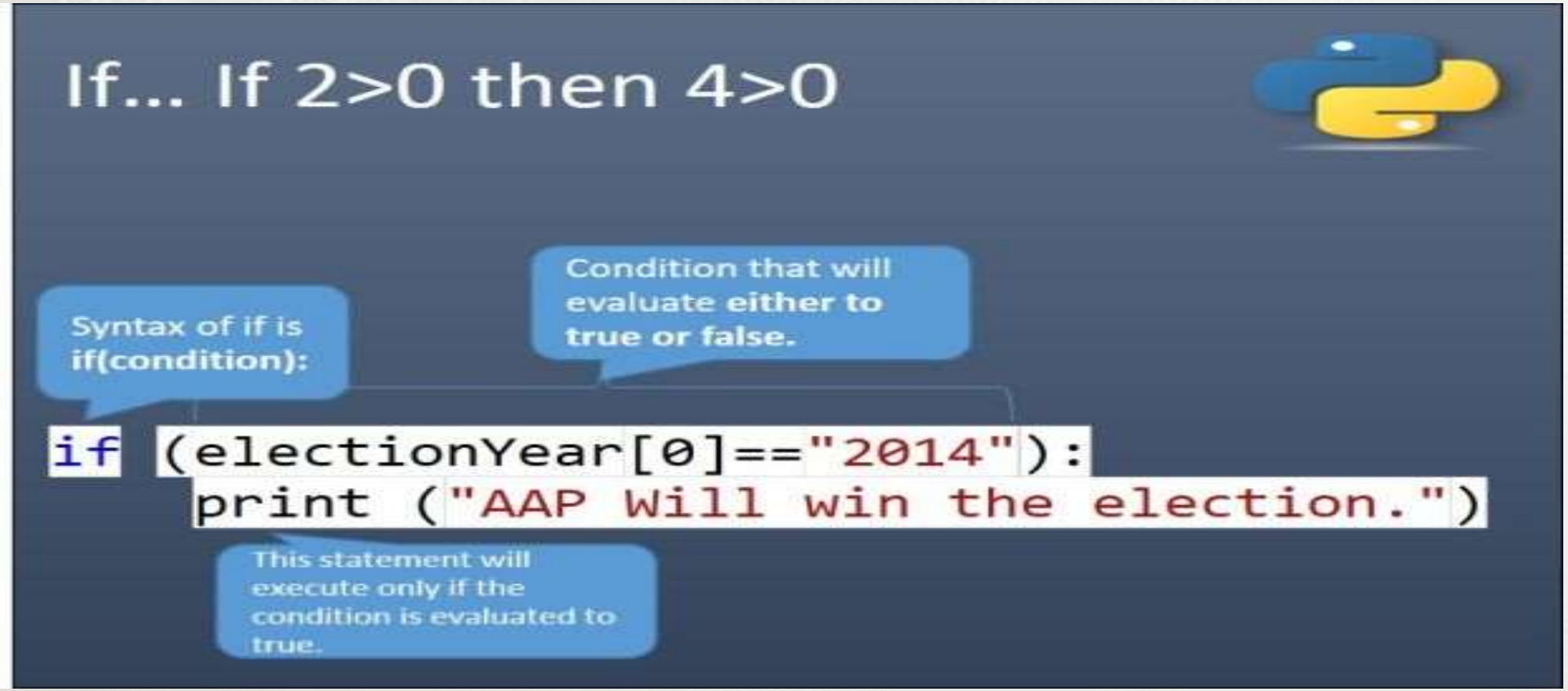
Control statements

- Python provide various tools for flow control.
- if , if .. elif .. else, if..else,while ,for , switch, pass, range, break, else, continue, function etc.

- Decision making is required when we want to execute a code only if a certain condition is satisfied.
- Syntax:
- if(cond):
    - Statement(s)

Note: Use of colon (":") in python is same as we use brackets in java or C++. Python uses colon and indentation for defining the scope or code block.

If Conditional Statement



if

```
mark1,mark2 = 53,65
if mark1 >= mark2:
    print (“mark1 >= mark2!" ) # True if mark1 >= mark2.
```

if block of code

```
mark1,mark2 = 53,65
if mark1 >= mark2:
    print (“mark1 >= mark2!”)
    print(mark1+mark2)
```

if block of code is executed once

```
mark1,mark2 = 53,65
if mark1 >= mark2:
    print (“mark1 >= mark2!”)
    print(mark1+mark2)
print("After if block")
```

mark1 >= mark2!

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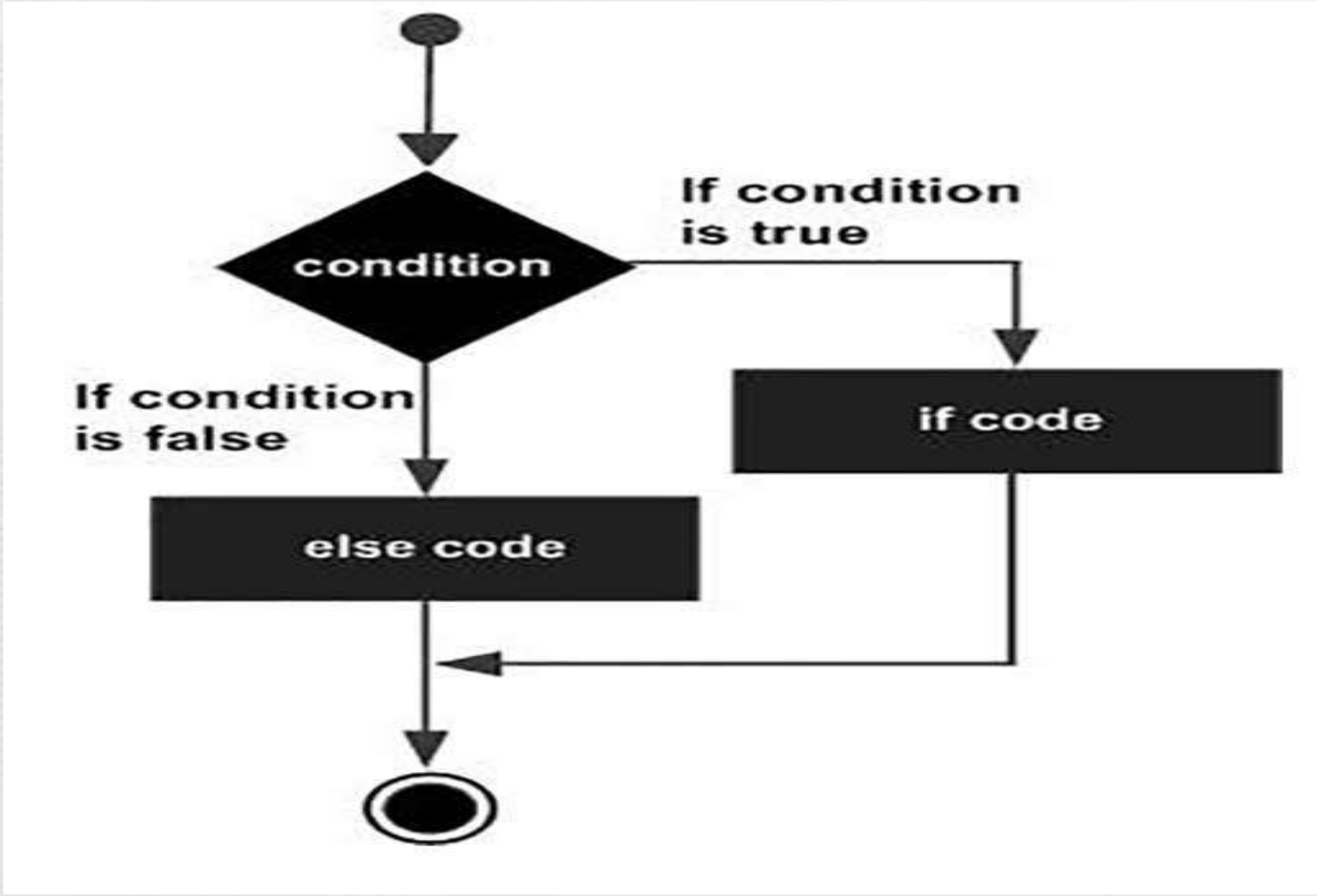
After if block

if else

if and else



else statement

- The "else condition" is usually used when you have to judge one statement on the basis of other.
- If one condition goes False, then there should be another condition that should True

If...else: If pocketMoney != 0 then enjoy else wait for salary.

Condition that will evaluate **either to true or false.**

This statement will execute only if the condition is evaluated to **true.**

```
if (electionYear[0]=="2014"):
    print ("AAP Will win the election.")
else:
    print("5 dangerous years are about to begin.");
```

This statement will execute only if the condition is evaluated to **false.**

- **If- else**
- Decision making is required when we want to execute if condition is true or false
- Ex: It’s like **if** have money **then** spend **else** wait for salary.
- Syntax:
- if(cond):
  - Statement1
  - Statement2

  else:

  Statement1

  Statement2

if & else

```
mark1,mark2 = 53,65
if mark1 >= mark2:
    print (“mark1 >= mark2!”)
    print(mark1+mark2)
else:
    print (“mark1<mark2!") # executed if mark1<mark2
```

if and else

- Deciding on different path of execution.
- In python, decision making is done with **if**, and **else** statements.
- Example of a simple if/else statement:
- **mark = 51**
- **if mark >= 50:**
- **   print ("You passed the test!")   # executed if mark >= 50.**
- **else:**
- **   print ("You failed the test!")   # executed if mark < 50**
- **'''Ensure that you give : after if and else to begin the block and every statement in the block should be indented at correct column '''**

If block of code & else block of code

```
mark1,mark2 = 53,65
if mark1 >= mark2:
    print (“mark1 >= mark2!”)
    print(mark1+mark2)
else:
    print (“mark1<mark2!") # executed if mark1<mark2
    print(mark1-mark2)
```

if elif


If...elif...else: Many options.
Option 1
Option 2
Option 3
Default option
if (delhiCM=="AK"):
print ("Change is about to come.")
elif(delhiCM=="From hand"):
print("Corruption will increase");
elif(delhiCM=="From Flower"):
print("Corruption will increase");
else:
print("Nothing can be said.")
#if (pocketMoney >90000):
print("Enjoy!")
#elif(pocketMoney >50000 and pocketMoney <90000)
print("Save money!")
#elif(pocketMoney <50000):
print("Nothing cab be said.")

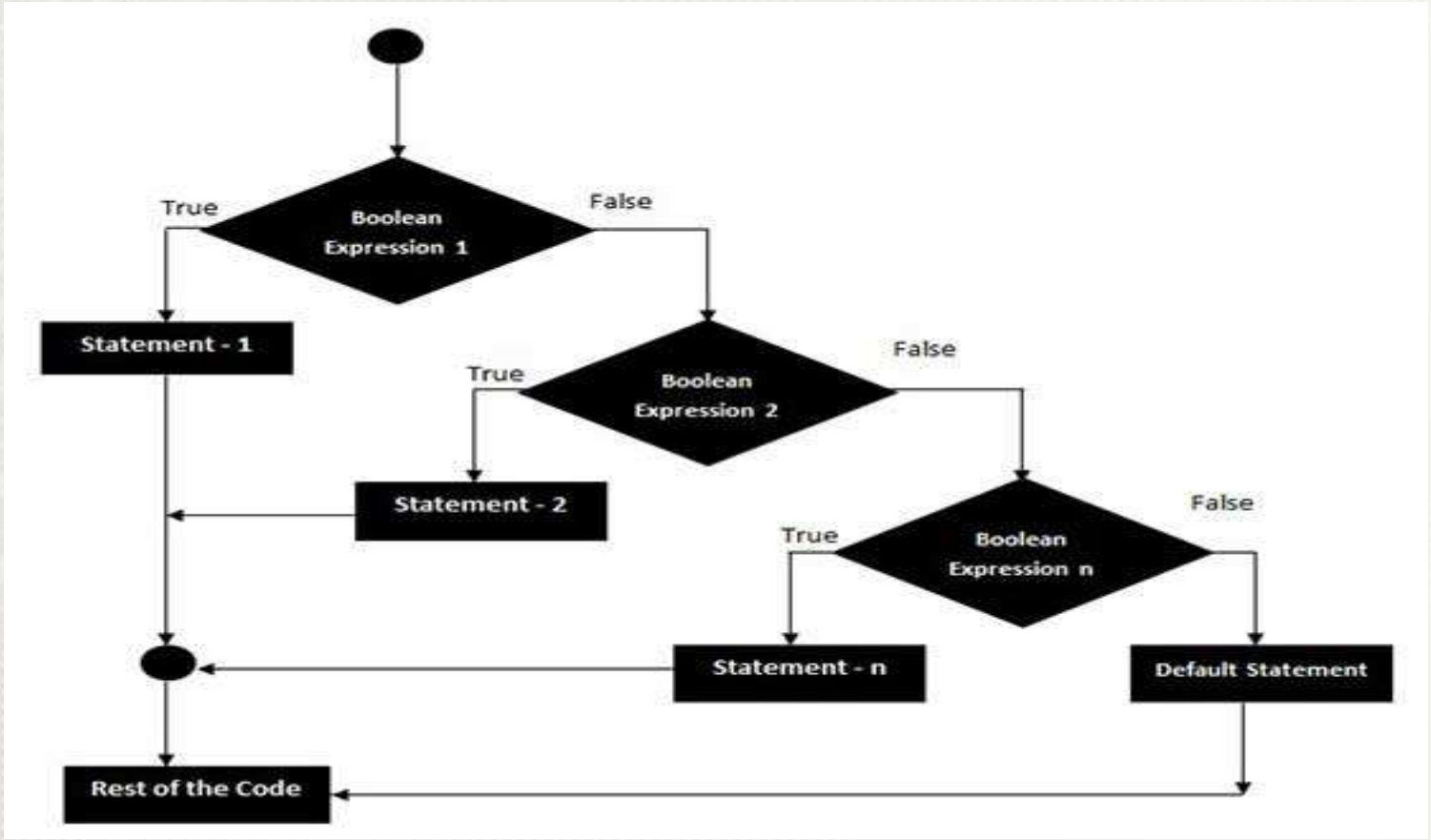
- If..elif..else statement
- condition tests if a something is true or false and it uses boolean values to check that.

Syntax:

if..else

```
if condition:
        statements
elif condition:
statements
else:
statements.
```

if & elif


Boolean Expression 1
True
False
Statement - 1
Boolean Expression 2
True
False
Statement - 2
Boolean Expression n
True
False
Statement - n
Default Statement
Rest of the Code

```
mark = 51
if mark >= 50:
    print (“passed test!" )   # executed if mark >= 50.
    print("Correct Column")
elif mark<50:
    print (“failed test!")    # executed if mark < 50
```

```
mark = 51
if mark >= 50:
    print (“passed test!" )   # executed if mark >= 50.
  print(“Wrong Column")
elif mark<50:
    print (“failed test!")    # executed if mark < 50
```

```
mark1,mark2 = 5,53
if mark1> mark2:
    print("mark1 > mark2")
elif mark1 == mark2:
    print("mark1 == mark2")
else:
    print("mark1 < mark2")
```

elif needs if

- mark1,mark2 = 5,53
- elif mark1 == mark2:
- print("mark1 == mark2")
- else:
- print("mark1 < mark2")

elif needs if

- mark1,mark2 = 5,53
- elif mark1 == mark2:
- print("mark1 == mark2")
- else:
- print("mark1 < mark2")

- What is the output of following program

```
x=0
if(x):
    print("x=0")
else:
    print("x!=0")
...
```

- x!=0

- What is the output of following program
- x=0.0
- if(x):
- print("x=0.0")
- else:
- print("x!=0.0")
- ...
- x!=0.0

- What is the output of following program
- x=''
- if(x):
- print("x='' ")
- else:
- print("x!='' ")
- ...
- x!=''

Exercise 1


```
''' Take marks of a student in one subject and then display his grade.
70 or Above: You scored an 'A'!.
60 to 69: You scored a 'B'!
50 to 59: You scored a 'C'!
Less than 50: You failed the test!
Use if, elif & else statements
'''
```

IfDemo1

Exercise 1 : Solution

```
mark = int(input("Enter marks: "))
if mark >= 70:
    print ("You scored an 'A'!" )     # executed if mark >= 70
elif mark >= 60:
    print ("You scored a 'B'!")       # executed if mark >= 60
elif mark >= 50:
    print ("You scored a 'C'!"  )     # executed if mark >= 50
else:
    print ("You failed the test!")    # executed if mark < 50
```

Exercise 2

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''' Take three numbers from the user and Find the highest of the three numbers. Give following input prompts

Enter a value

Enter b value

Enter c value

Give one of the outputs

a is highest

or

b is highest

or

c is highest

or

all are equal

Exercise 2 : Solution

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```
a = int(input("Enter a value "))
b = int(input("Enter b value "))
c = int(input("Enter c value "))
if(a>b and a>c):
    print("a is highest")
elif(b>a and b>c):
    print("b is highest")
elif(b>a and c>b):
    print("c is highest")
else:
    print("all are equal")
```

Python program to check if the input year is a leap year or not

Solution

```
year = 2000
# To get year (integer input) from the user
# year = int(input("Enter a year: "))

if (year % 4) == 0:
   if (year % 100) == 0:
       if (year % 400) == 0:
           print("{0} is a leap year".format(year))
       else:
           print("{0} is not a leap year".format(year))
   else:
       print("{0} is a leap year".format(year))
else:
   print("{0} is not a leap year".format(year))
```

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- 1.Program to enter marks of five subjects phy,chem,maths,biology and computer,calculate percentage and grade according to given condition.
- If per>=90%:Grade A
- If per>=80%:Grade B
- If per>=70%:Grade C
- If per>=60%:Grade D
- If per>=40%:Grade E
- If per<40%:Grade F

```
phy=int(input("enter phy marks:"))
chem=int(input("enter chem marks:"))
maths=int(input("enter maths marks:"))
bio=int(input("enter biology marks:"))
c=int(input("enter computer marks:"))
per=(phy+chem+maths+bio+c)//5
print("percentage:",per)
if(per>=90):
    print("Grade A")
elif(per>=80):
    print("Grade B")
elif(per>=70):
    print("Grage C")
elif(per>=60):
    print("Grade D")
elif(per>=40):
    print("Grade E")
else:
    print("Fail")
```

Using if & else

- Exercise: While purchasing certain items, a discount of 10% is offered if the amount purchased is more than 1000. If quantity and price per item are input through the keyboard, write a program to calculate the total expenses.
- Enter Price : 100
- Enter Quantity : 20
- Price= 100 Quantity= 20
- amount= 1800.0 discount= 200.0

- ====== ======
- Enter Price : 100
- Enter Quantity : 10
- Amount = 1000

```
discount=0
price = int(input("Enter Price : "))
qty = int(input("Enter Quantity : "))
amount = price*qty
if(amount>1000):
    discount = amount*.1
    amount -= discount
    print("Price= ",price, " Quantity= ",qty )
    print("amount= ", amount, " discount= ", discount)
else:
    print("Amount = ",amount)
```

Exercise

/* IfElifElseQuadratic.py */

/* Program to evaluate real roots of quadratic equation

$ax^2 + b x + c = 0$ using quadratic formula

x = (-b +/- sqrt(b*b – 4*a*c)) / (2*a)

Program rejects cases where roots are complex

ie when b*b – 4*a*c is negative or where

a = 0. */

- 1.Program to input basic salary of an employee and calculate its gross salary according to condition
- Basic salary<=10k:HRA=20%;DA=80%
- Basic salary<=20k:HRA=25%;DA=90%
- Basic salary>20k ;HRA=30%;DA=95%

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- 2.Program to input electricity unit charges and calculate total electricity bill according to the given condition:
- For first 50 units Rs.0.50/unit
- For next 100 units Rs0.75/unit
- For next 100 units Rs1.20/unit
- For unit above 250 Rs.1.50/unit an additional surcharge of 20% is added to the bill.

Conclusion

You are aware of

Conditional Statements

Types of Conditional Statements

We will proceed with

Loops

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THANK YOU