

```

In [2]: # python : 1 . programming language .
        # Language : way of communication
        # programming language : way of communication with computer .

        #   input      ---->   computer      -----> output

        # python : 2 . It is interpreter : (ordered by ordered )
        #   line by line : output .

        # Interpreter                                compiler
        # line by line                                complete code compile (first : error checking , there is no error then
                                                # it conver high level language into low level language . )
                                                # high level : english , hindi      binary : machince language .

        # slower                                    faster
        # execution time more                        execution time less
        # error finding easy                          error find complex .
        # eg : python                                eg : java, c , c++

        # python : 3 . It is high level programming language .
        #   we write python code in english so we can python is high level programming language .

        # python : 4 . It is script programming language .
        # using python script we can generate new things .

        # javascript : using javascript we can create front end code .
        # jquery :

        # python : 5 . It is plateform independent language .
        # we can use any ID's for writing python code .
        # anaconda with jupyter notebook .
        # pycharm .
        # python .
        # google colab
        # vscode .

```

```
# python : 6 . It is open source language .  
# if you want to give any right suggestion for changing the python code you can also give .  
  
# python : 7 . It is used for general purpose .  
# Application(Uses) :  
# Data Analytics  
# Data Science (machine learning , deep learning , nlp )  
# Ai (Artificial Intelligency )  
# web development (for backend )  
# Gui(desktop application )  
# Internet of things(IOT) .  
  
# Data Science :  
# python  
# python libraries  
# machine learning (ml)  
# deep learning (dl)  
# natural language processing (nlp)  
# Ai(Artificial Intelligency)  
  
# Data Analytics :  
# python  
# python Libraries  
  
# Ai :  
# algorithms , models .  
  
# web development :  
# backend : python  
# frameworks : django, flask  
# Api : frameworks  
  
# Gui : Tkinter  
# UI/UX : user interface  
  
# IOT : embedded(arduino , raspberry pi ,sensors , actuator ,transducer )  
# and python Gui , threads , web scraping .  
  
# python : 8 : It is semi object oriented programming language .
```

```
# without classes  
# with classes .  
# Banking system .  
# Railway System .  
# Library system .
```

```
In [ ]: # core python :  
  
# keywords and variables .  
# data types .  
# casting of data .  
# operators .  
# condition .  
# loops .  
# data structure .  
# function .  
# oops (object oriented programming system )  
# file handling  
# exception handling  
# data base connectivity .  
# strings .  
# regular expressions ..  
# modules .  
# formatting .
```

```
In [ ]: # python libraries :  
# numpy  
# pandas  
# matplotlib  
# seaborn
```

```
In [ ]: # ml :  
# supervised : regression,classification .  
# unsupervised learning : clustering , association , dimensionality reduction , Anomaly reduction  
# semi supervised :  
# reinforcement .
```

```
In [ ]: # installation of anaconda . id's : anaconda with jupyter notebook .
```

```
# go to the browser and search python anaconda download .  
# go to download anaconda distribution and fill your email id  
# checked (check box) and click on submit .  
# you will get an email regarding ananconda download here it will provide a link .  
# click on link and it will redirect on download page .  
# download anaconda and install it .  
# after installation search anaconda navigator .  
# here you will get jypter notebook click on the launch and start your jupyter notebook .  
# in jupyter note book right side you will get new option .  
# click on new and after the notebook . here new notebook will be opened .
```

```
In [ ]: # keywords and variables :
```

Keywords

```
In [ ]: # keywords : predefined words .  
# we can not redefined it .  
# if , else , and ,break , continue, pass , while , for , asset  
# we can not use like a variable .  
# reserve words .
```

```
In [3]: # if=10 # keyword .  
# print(if)
```

```
In [2]: IF=10  
print(IF)
```

10

Variables

```
In [ ]: # variables : user defined .  
# it is used to store values of different different data types ..  
# it is called container .
```

```
In [ ]: # data types :  
# data : collection of information .
```

```
# eg : without using helmet , driving license you are driving .
# challan cut .
# driver_name driver_age  address  rupees
# prashant      20          gurgaon  2000.50
```

DataTypes

```
In [ ]: # data types :

# primitive      # non-primitive

# primitive :
# int   : numbers , without point values .   eg : driver_age
# float : decimal , point values .   eg : rupees
# string : collection of characters , sequence of characters , combination of characters , group of characters ,
# it is represented by ' ' , " " , (single line detail) , " " " " (multiple lines )   eg : driver_name , address
# boolean : True and False
# complex : real numbers + imaginary numbers
```

```
In [4]: # keywords and variables eg :

# comments : it is used for only showoff . it does not compile (run) in the program .
# In python we write comment using # .

name="shubham" # name is a variable . , name is doing store a value "shubham " , "shubam" is literal . literal type is str
# = : It is a operator , it assign right side value in left side .

print(name)
```

shubham

```
In [1]: student_name="prashant"
print(student_name)
```

prashant

```
In [2]: student_age=23 # student_age : variable_name , 23 : it is literal , data type : int ,
# = : it is assignment operator , it assign right side value in left side .
print(student_age)
```

23

```
In [3]: student_age=34  
print(student_age)
```

34

```
In [4]: print(student_age)
```

34

```
In [5]: student_marks=40.5  
print(student_marks)
```

40.5

```
In [6]: print(student_age)
```

34

```
In [7]: # non-primitive :  
# list  
  
lst=[]  
  
student_age=20  
lst.append(student_age)
```

```
In [8]: print(student_age)
```

20

```
In [9]: student_age=25  
lst.append(student_age)  
print(student_age)
```

25

```
In [10]: print(student_age)
```

25

```
In [11]: print(lst)
```

[20, 25]

```
In [ ]: # type :  
  
# predefined function : type(variable_name)
```

```
In [12]: student_roll="ST12304"  
print(student_roll)
```

ST12304

```
In [13]: print(type(student_roll))
```

<class 'str'>

```
In [14]: student_subject="python"  
print(student_subject)  
print(type(student_subject))
```

python

<class 'str'>

```
In [16]: student_study_8_hours=False  
print(student_study_8_hours)  
print(type(student_study_8_hours))
```

False

<class 'bool'>

```
In [18]: student_sleeping_time=13.5  
print(student_sleeping_time)  
print(type(student_sleeping_time))
```

13.5

<class 'float'>

```
In [20]: # for=30  
# print(for)  
# print(type(for)) # error #can not use keyword as a variable .
```

```
In [21]: # how to take user choice input .  
# string : input("message ")
```

```
In [23]: student_name=input("enter student name")  
print("student name is : ",student_name)
```

student name is : sunil

```
In [24]: student_name="yassica"  
print(student_name)
```

yassica

```
In [26]: student_address=input("Enter your destiantion address")  
print(student_address)
```

delhi

```
In [31]: # int : int(input("message "))  
# float : float(input("message "))  
  
student_age=int(input("enter your age"))  
print(student_age)
```

23

```
In [32]: # user choice input : run that will enter the data .  
  
# string : input("message")  
# int : int(input("message "))  
# float : float(input("message "))  
  
student_name=input("enter student name") # str  
student_age=int(input("enter student age ")) # int  
student_course=input("enter your course ") # str  
student_cgpa=float(input("enter student cgpa")) # float  
  
print("student_name is : ",student_name)  
print("student_age is : ",student_age)  
print("student_course is : ",student_course)  
print("student_cgpa is : ",student_cgpa)
```



```
student_name is : ankit
student_age is : 25
student_course is : data analytics
student_cgpa is : 5.67
```

```
In [33]: student_name=str(input("enter student name"))
        print(student_name)
```

```
suraj
```

```
In [34]: # Typecasting : if we are converting a data type into another data type that's called typecasting .
```

```
company_address=input("enter company address")
print(company_address)
print(type(company_address))
```

```
bus stand road , sector 14
<class 'str'>
```

```
In [36]: print(str(company_address))
        print(type(company_address))
```

```
bus stand road , sector 14
<class 'str'>
```

```
In [38]: employees=input("enter total employees")
        print(employees)
        print(type(employees))
```

```
150
<class 'str'>
```

```
In [39]: employees=int(input("enter total employees"))
        print(employees)
        print(type(employees))
```

```
200
<class 'int'>
```

```
In [40]: employees=str(input("enter total employees"))
        print(employees)
        print(type(employees))
```

```
150
<class 'str'>
```

```
In [41]: employees=float(input("enter total employees"))
         print(employees)
         print(type(employees))
```

```
145.0
<class 'float'>
```

```
In [43]: age="23"
         print(age)
         print(type(age))
```

```
23
<class 'str'>
```

```
In [44]: address='bus stand road '
         print(address)
```

```
bus stand road
```

```
In [45]: address="bus stand road,sector-14 "
         print(address)
```

```
bus stand road,sector-14
```

```
In [49]: address="""bus stand road, sector-14
         gurugram , haryana
         India """
         print(address)
```

```
bus stand road, sector-14
gurugram , haryana
India
```

```
In [50]: age=23
         print(age)
         print(type(age))
```

```
23
<class 'int'>
```

TypeCasting

```
In [51]: age=int("23")  
print(age)  
print(type(age))
```

```
23  
<class 'int'>
```

```
In [54]: # age=int("23.0")  
# print(age)  
# print(type(age))
```

```
In [53]: age=int(23.0)  
print(age)  
print(type(age))
```

```
23  
<class 'int'>
```

```
In [ ]: # keynotes :  
# int(int) : int  
# int("int") :int  
# int("float") : error  
# int(float): int  
# int("Str") :error
```

```
In [55]: fees=int(4000)  
print(fees)
```

```
4000
```

```
In [56]: fees=int("4000")  
print(fees)
```

```
4000
```

```
In [58]: # fees=int("4445.45")  
# print(fees) # error
```

```
In [59]: fees=int(4445.45)
         print(fees)
```

4445

```
In [61]: # fees=int("453st")
         # print(fees) # error
```

```
In [64]: num=input("enter a number")
         print(num)
         print(type(num))
         num1=int(num)
         print(num1)
         print(type(num1))
```

45

<class 'str'>

45

<class 'int'>

```
In [66]: num=int(input("enter a number"))
         print(num)
         print(type(num))
```

34

<class 'int'>

```
In [67]: # float :

         num=float(23)
         print(num)
```

23.0

```
In [68]: num=float("23")
         print(num)
```

23.0

```
In [69]: num=float("23.45")
         print(num)
```

23.45

```
In [70]: num=float(input("enter a float number"))
         print(num)
         print(type(num))
```

23.45

<class 'float'>

```
In [72]: # num=float("34.45s")
         # print(num) # error
```

```
In [73]: # keynotes :
         # float(int) : float with .0
         # float("int") : float with .0
         # float("float") : float value
         # float("str") : error
```

```
In [75]: num=int(float(str(int(input("enter a number "))))
         # int("23") : 23
         # str(23) : "23"
         # float("23") : 23.0
         # int(23.0) : 23
         print(num)
```

23

```
In [3]: # keynotes :

         # int(int) : int
         # int("int") :int
         # int("float") : error
         # int(float): int
         # int("Str") :error   str meanging : alphabats or special characters

         # float(int) : float with .0
         # float("int") : float with .0
         # float("float") : float value
         # float("str") : error   : str meanging : alphabats or special characters .

         # a=int(str(float(str("34.5"))))
```

```
# str("34.5") : "34.5"  
# float("34.5") : 34.5  
# str(34.5) : "34.5"  
# int("34.5") : error  
# print(a) # error
```

```
In [4]: a=int(float("3.45"))  
# float("3.45") : 3.45  
# int(3.45) : 3  
b=str(a)  
# str(3) : "3"  
c=float(b)  
# float("3") : 3.0  
print(c)
```

3.0

```
In [10]: a=float(str(2.34))  
  
# str(2.34) : "2.34"  
# float("2.34") : 2.34  
b=str(a)  
# str(2.34) : "2.34"  
print(b)  
print(type(b))
```

2.34

<class 'str'>

```
In [5]: str(3)
```

Out[5]: '3'

```
In [8]: print(str(1.23))  
print(type(str(1.23)))
```

1.23

<class 'str'>

Operators

```
In [ ]: # Operators : it performs some particular operatoins .
# Arithmetic Operators (+,-,/,*,%,**,//)
# Assignment Operators (=,+=,-=,*=,/=,%=,//=,**=)
# Logical Operators (and , or ,not)
# Relative Operators (>,<,>=,<=,==,!=)
# Bitwise Operators (and gate(&),or gate(|),xor gate(^))
# Unary Operators (left shift(<<),right shift(>>))

# increment (++)and decrement(--) and ternary operators do not support by python .
```

```
In [ ]: # Arithmetic Operators :
# + :
```

```
In [ ]: #          +
# addition      concatenation
```

```
In [ ]: # Addition :
# 1 . int + int : addition (int)
# 2 . int + float : addition(float)
# 3 . float + int : addition (float)
# 4 . float + float : addition (float)
# 5 . complex + complex : addition (complex)
# 6 . int + complex : addition(complex)
# 7 . float + complex : addition(complex)
```

```
In [ ]: # concatenation :
# 1 . str + str : concate
```

```
In [ ]: # error :
# 1 . int + str :error
# 2 . float + str : error
# 3 . complex + str : error
```

```
In [13]: # a=int(input("enter first number "))
```

```
# print("number value is : "+a) error
```

```
In [14]: b=input("company name ")  
print("company name is : "+b)
```

company name is : tca

```
In [15]: c=30  
print("c value is : ",c)
```

c value is : 30

```
In [16]: student_name=input("enter student name ")  
print("student name is : "+student_name)
```

student name is : vishal

```
In [18]: student_age=int(input("enter student age"))  
print("student age is : ",student_age)
```

student age is : 23

```
In [19]: 4+5
```

Out[19]: 9

```
In [20]: 10+4.0
```

Out[20]: 14.0

```
In [21]: "2"+"3"
```

Out[21]: '23'

```
In [23]: # 2+"2" # int + str : error
```

```
In [25]: a="tca"  
b=" gurgaon"  
print(a+b)
```

tca gurgaon


```
In [26]: b=" gurgaon"
         print("tca"+b)
```

tca gurgaon

```
In [28]: # c=10
         # print("tca "+c)
```

```
In [29]: student_name=input("enter student name")
         print("Student name is : "+student_name)
```

Student name is : ankit

```
In [31]: student_age=int(input("enter student age"))
         print("student age is : ",student_age)
```

student age is : 24

```
In [35]: a=32456
         print(int(a/10))
```

3245

```
In [38]: c=float(int("32")+int(float("2.3")))
         print(c)
```

34.0

```
In [39]: # d=str(float("2.3))+int(str("2"))
         # print(d) # error
```

```
In [40]: a=40
         b=30
         c=int("20")
         print(a+b+c)
```

90

```
In [41]: a="10"
         b="20"
```

```
c="30"  
print(a+b+c)
```

102030

```
In [ ]: a=int("20") # 20  
        b=float("2.34") # 2.34  
        c=int("1"+"2"+"3")+a+b # 123+20+2.34  
  
        print(a+b+c)
```

```
In [43]: int("1"+"2"+"3") # int("123")
```

Out[43]: 123

```
In [45]: print(type(int("1"+"2"+"3"))  
  
<class 'int'>
```

```
In [47]: float("2"+"3")
```

Out[47]: 23.0

```
In [1]: # Addition :  
        # 1 . int + int : addition (int)  
        # 2 . int + float : addition(float)  
        # 3 . float + int : addition (float)  
        # 4 . float + float : addition (float)  
        # 5 . complex + complex : addition (complex)  
        # 6 . int + complex : addition(complex)  
        # 7 . float + complex : addition(complex)  
  
        # concatenation :  
        # 1 . str + str : concate/merge  
  
        # error :  
        # 1 . int + str :error  
        # 2 . float + str : error  
        # 3 . complex + str : error
```

```
a=10
b=30
c="2"+"3" # "23"
d=a+b+int(c)
# 10+30+23=63
print(d)
```

63

```
In [2]: num1=int(input("enter first number "))
num2=int(input("enter second number"))
str1=input("enter string 1")
str2=input("enter string 2")

num3=num1+num2+int(str1+str2)
print(num3)
```

605

```
In [3]: # - : Operators :
# int - float : float
# int - int : int
# float - float : float
# str - str : error

10-5
```

Out[3]: 5

In [4]: 3.0-2

Out[4]: 1.0

```
In [5]: (int(float(str(float(int("3"))))))-(float(int(str(int(float("2.45"))))))
# int("3") : 3
# float(3) : 3.0
# str(3.0): "3.0"
# float("3.0"):3.0
# int(3.0)=3

# float("2.45")=2.45
```

```
# int(2.45)=2  
# str("2")="2"  
# int("2")=2  
# float(2)=2.0
```

Out[5]: 1.0

In [6]: 3-2.0

Out[6]: 1.0

In [8]: # "10"-5 # error

In [9]: # multiply : *

```
# int * int : int  
# int * float : float  
# str * str : error  
# int * str(single) : repeat  
# float * str : error
```

30*2.3

Out[9]: 69.0

In [10]: 2.3*4.2

Out[10]: 9.66

In [12]: # "tca"*"gurgaon" # string can not mutliply together .

In [14]: "tca "*10

Out[14]: 'tca tca tca tca tca tca tca tca tca tca '

In [16]: # "tca "*10*" gurgaon" : error

```
In [17]: a=10
         b=20
         c="2"*3    # "222"
         print(a+b+int(c))
```

252

```
In [18]: a=25
         b="3"+"2"  # 32
         c="1"*3    # 111
         d=a+int(b)+int(c)
         # 25+32+111
         print(d)
```

168

```
In [19]: a=int("2"*3+"3"*2)
         # int("222"+"33") : int("22233") : 22233
         b=120    # 22233+120 : 22253
         c=a+b
         print(c) # 375 22353 345 456
```

22353

```
In [20]: # /,%,//

         # / : divide : it divide completely .

         # % : remanider : it gives remainder

         # // : floor division : after point it skip values
```

```
In [21]: a=20
         b=8
         print(a/b)
```

2.5

```
In [22]: print(a//b)
```

2

```
In [23]: print(a%b)
```

4

```
In [24]: a=int(2*"4")+5  
b=7  
print(a/b)
```

7.0

```
In [25]: print(a//b)
```

7

```
In [26]: print(a%b)
```

0

```
In [27]: print(3%4)
```

3

```
In [28]: print(3/4)
```

0.75

```
In [29]: print(3//4)
```

0

```
In [31]: 4**3 # 4*4*4
```

```
Out[31]: 64
```

```
In [1]: a=13  
b=int("4"*3) # int("444") : 444  
c=a+b # 457  
d=c%10  
print(d) # 45.7 # 10  
# 7
```

7

```
In [2]: d=c/10  
print(d)
```

45.7

```
In [5]: # / : it divide completely till point values .  
# // : it divide before point values .  
# % : it give remainder .
```

```
a=23  
b=int("10"+"5") # 105  
c=int("3"*2) # 33  
d=a+b+c  
print(d%7)  
print(d/7)  
print(d//7)
```

0
23.0
23

```
In [8]: a=161  
print(a%7)  
print(a/7)  
print(a//7)
```

0
23.0
23

```
In [11]: a=30  
b=7  
print(a//7)  
print(a%7)  
print(a/7)
```

4
2
4.285714285714286

```
In [12]: a=("1"+"0")*2 # ("10")*2= 1010  
b=111
```

```
print(int(a)+b) # 131 # 1121
```

1121

In [13]: *# ** : it is used to give the power .*

```
2**3
```

Out[13]: 8

In [14]:

```
a=4
b=4
print(a**b)
```

256

In [15]:

```
3**5
```

Out[15]: 243

In [16]: *# pow : it is predefined function .*

```
pow(3,5)
```

Out[16]: 243

In [17]:

```
a=10
b=20
c=3
d=4
e=a+b+c**d
print(e)
```

111

In [18]:

```
f=a+b+c*d
print(f)
```

42

In [29]: *# assignment : =, +=, -=, *=, /=, //=, %=, **=*
= :


```
# it is used to assign value from right side to left side .  
# left side variables(defined variables ,non defined variables)  
# right side values or defined variables ,  
#In right side non defined variables are not allowed .  
#In left side values are not allowed .  
# == : it compare right side values with left side .  
# right side : values or defined variables . non defined variables are not allowed .  
# left side : values or defined variables . non defined variables are not allowed .  
# it give always boolean result (true and false . )
```

```
a=10  
print(a)
```

10

```
In [23]: b=1  
print(b)
```

1

```
In [25]: z=5  
c=10+z  
print(c)
```

15

```
In [26]: c=10+a  
print(c)
```

20

```
In [30]: 10==10
```

Out[30]: True

```
In [31]: 10==9
```

Out[31]: False

```
In [34]: a=2  
b=int("3"*2+"5")
```

```
# int("335")=335  
a+b==337
```

Out[34]: True

In [35]: "tca "*5

Out[35]: 'tca tca tca tca tca '

In [36]: 3*5

Out[36]: 15

In [39]: "3"*5+"2"

Out[39]: '333332'

In [40]: "3"+"4"

Out[40]: '34'

In [41]: 3+4

Out[41]: 7

In [43]: "tca "+"gurgaon "+"bus stand"=="tca gurgaon bus stand"

Out[43]: True

In [44]: print("tca "+"gurgaon "+"bus stand")

tca gurgaon bus stand

In [45]: print("tca gurgaon bus stand")

tca gurgaon bus stand

In [46]: print(type("tca gurgaon bus stand"))

```
<class 'str'>
```

```
In [47]: print(type("tca "+"gurgaon "+"bus stand"))
```

```
<class 'str'>
```

```
In [48]: "2"+"2"+"4"+"8"=="2248"
```

```
Out[48]: True
```

```
In [49]: "2"+"2"+"4"+"8"==2248
```

```
Out[49]: False
```

```
In [50]: # assignment operators :  
# += :  
  
a=10  
a+=20 # a=a+20 # 10+20  
print(a)
```

```
30
```

```
In [52]: a=20  
b=int("2"*3)# 222  
c=a+b # 242  
c+=20 # c=c+20  
print(c)
```

```
262
```

```
In [53]: c=10  
c=c+5  
print(c)
```

```
15
```

```
In [54]: c=20  
c+=5  
print(c)
```

```
25
```

```
In [55]: c=30  
         d=c+5  
         print(d)
```

35

```
In [56]: c=100  
         c-=27  
         print(c)
```

73

```
In [57]: c=100  
         c=c-27  
         print(c)
```

73

```
In [58]: c=100  
         d=c-27  
         print(d)
```

73

```
In [60]: c=20  
         c*=5 # c=c*5  
         print(c)
```

100

```
In [61]: c=200  
         c/=40  
         print(c)
```

5.0

```
In [62]: c=200  
         c//=45  
         print(c)
```

4

```
In [63]: c=200  
c/=45  
print(c)
```

4.4444444444444445

```
In [64]: c=200  
c%=45  
print(c)
```

20

```
In [65]: c=4  
c**=3  
print(c)
```

64

```
In [1]: # complex : real + imaginary  
  
a=5+5j  
print(a)
```

(5+5j)

```
In [2]: a=7+8j  
b=9+9j  
print(a+b)
```

(16+17j)

```
In [3]: a=10 # 10+0j  
b=3+5j  
print(a+b)
```

(13+5j)

```
In [5]: a=5j # 0 + 5j  
b=10+3j  
print(a+b)
```

(10+8j)

```
In [6]: num=int(input("enter a number "))  
        print(num)
```

10

```
In [7]: # complex :  
        b=complex(2,3)  
        print(b)
```

(2+3j)

```
In [8]: c=complex(int(input("enter a number")),int(input("enter second number ")))  
        print(c)
```

(2+5j)

```
In [9]: # int + complex : complex  
        # float + complex : complex  
        # str + complex : error  
  
        a=10+5.0j  
        b=3+2j  
        print(a+b)
```

(13+7j)

```
In [11]: a=7  
         b=7.0  
         print(type(a))  
         print(type(b))
```

<class 'int'>
<class 'float'>

```
In [12]: c=13+7j  
         print(type(c))
```

<class 'complex'>

```
In [13]: d=13+7.0j  
         print(type(d))
```

```
<class 'complex'>
```

```
In [ ]: # minus value inside root .
```

```
In [14]: # condition : flow control statement .  
# if else  
print("tca gurgaon")
```

tca gurgaon

```
In [16]: if(False):  
    print("tca gurgaon")
```

```
In [18]: a=10  
if(a>15):  
    print("tca")
```

```
In [ ]: # if else :  
  
# if(condition):    identations .  
#     statements  
# else:  
#     statements
```

```
In [19]: num=20  
if(num>10):  
    print("data science ") # depend statements .  
    print("data analytics ") # depend statements .  
    print("full stack development") # depend statements .  
else:  
    print("AWS") # depend statements .  
    print("Cloud computing") # depend statements .  
print("react js ") # independent statements .
```

data science
data analytics
full stack development
react js

```
In [ ]: # if(condition){  
  
# }  
# else{  
  
# }
```

```
In [20]: a=10  
print(a)
```

10

```
In [ ]: # if(condition):  
#     statements  
# else:  
#     statements  
  
# if condition result is true then if statement execute .  
# if condition result is false then else statement execute .  
  
# both never will be execute together .
```

```
In [ ]: # relative operators : >,<,>=,<=,==,!=  
# These operators give true and false result . boolean result .
```

```
In [23]: # > : 10>5 : true  
# 5 > 10 : false  
  
# find the greatest of two numbers .  
  
num1=int(input("enter first number "))  
num2=int(input("enter second number "))  
  
print(num1>num2)  
if(num1>num2):  
    print("num1 is greater than num2")  
else:  
    print("num2 is greater than num1")
```


True
num1 is greater than num2

```
In [26]: age=int(input("enter the age "))

if(age<18):
    print("you are not eligible play this game ")
else:
    print("you are eligible to play for this game ")
```

you are eligible to play for this game

```
In [ ]: # >= and <= .
```

```
In [27]: age=int(input("enter the age "))

if(age<=18):
    print("you are not eligible play this game ")
else:
    print("you are eligible to play for this game ")
```

you are not eligible play this game

```
In [29]: age=int(input("enter the age"))
if(age>=60):
    print("you are eligible for taking pension from governement ")
else:
    print("you are not eligible for taking pension from governement ")
```

you are not eligible for taking pension from governement

```
In [30]: # == : comparison .

# find a given number is odd or even .
num=int(input("enter a number "))
if(num%2==0):
    print("even")
else:
    print("odd")
```

odd

```
In [ ]: # % n : possible values : 0,1,2,3,4,5,6,7 .....n-1
# %2 : 0,1
# %3 : 0,1,2
# %4 : 0,1,2,3
# %5 : 0,1,2,3,4
# %6 : 0,1,2,3,4,5

# %n : 0 to n-1
```

```
In [32]: # find the last digit of a number .

# 6789 : 9

# %10 : 0 to 9 ,

# 5678 :
num=5678
print(num/10)
print(num%10)
```

567.8
8

```
In [35]: # Last digit of any number : %10 .
# Last two digit of any number : %100

num=int(input("enter a number"))
print(num%10)
```

7

```
In [2]: # Logical operators :
# condition statement : control flow statement :
# if else :

# if (condition) :
#     statements (dependent statement)
# else :
#     statements (dependent statement)
```

```

# condition : if condition result is true then if statement execute .
# if condition result is false then else statement execute .

# both statement never execute together .

# relative operator . >,<,>=<==,!=

# right side value compare with left side .

num=int(input("enter a number "))
if(num>20):
    print("number is greater than 20")
else:
    print("number is less than 20")
print("we are studying about the condition statement ")

```

number is less than 20
we are studying about the condition statement

In [3]: *# statement : inside if or not .*

```

num=10
if(num==10):      # indentation .
    print("yes")
print("tca")

```

yes
tca

In [5]: pin=int(input("enter the pin number of atm "))

```

if(pin==3263):
    print("you can withdraw money from atm")
else:
    print("invalid pin ,reenter your pin")

```

you can withdraw money from atm

In [6]: *# relative operators : compare values .*
right side with left side .

```

# left side ---> relative operator ---> right side

# < : right side value must be greater than left side
# > : right side value must be less than from left side .
# <= : right side values must be greater than and equal to left side .
# >= : right side values must be less than and equal to left side .
# == : both side values must be only equal .
# != : both side values must be different .

# find the greatest of two numbers .

num1=int(input("enter first number "))
num2=int(input("enter second number "))

if(num1>num2):
    print("num1 is greatest")
else:
    print("num2 is greatest")

```

num1 is greatest

```

In [7]: # find a number is divided from 13 .

num=int(input("enter a number"))

if(num%13==0):
    print("num is divided from 13 . ")
else:
    print("num is not divided from 13 . ")

```

num is divided from 13 .

```

In [ ]: # Logical operators :
# and , or , not .

# and : multiple condition inside if .

```

```
# we provide mutiple condition inside if and we are using 'and' operator between them
# if all the conditions results are true then and give true result .
# if anyone condition is false then and give false result .

# for special 2 conditions :
# input          output
# true   true    true
# true   false   false
# false  true    false
# false  false   false

if(True and False):
    print("yes")
else:
    print('no')
```

```
In [12]: print(True and True and True and True and True )
```

True

```
In [13]: print(True and True and True and True and False)
```

False

```
In [14]: print(False and False and False )
```

False

```
In [ ]: # if(True) : if(False)
```

```
In [11]: # print(True and False)
```

```
In [ ]: # if(True and False and True and False and False and False)
```

```
In [10]: # print(True and False and True and False and False and False)
```

```
In [ ]: # find a number is odd and divided by 7 .
```

```
In [20]: num=int(input("enter a number "))
print(num%2==1)
print(num%7==0)
if(num%2==1 and num%7==0):
    print("number is odd and divided by 7 . ")
else:
    print("number is not fullfilling our condition")
```

True

False

number is not fullfilling our condition

```
In [ ]: # and : final result provide .
# if can take only true or false .
```

```
In [22]: # national :
# country_name : india .
# age > 18 .

country_name=input("enter your country ")
age=int(input('enter your age'))
if(country_name=="india" and age>18):
    print("you can play national in india")
else:
    print("you can not play national in india")
```

you can play national in india

```
In [24]: first_year=float(input("enter your first year cgpa"))
second_year=float(input("enter your second year cgpa"))
third_year=float(input("enter your third year cgpa"))
fourth_year=float(input("enter your fourth year cgpa"))

if(first_year>5.0 and second_year>5.0 and third_year>5.0 and fourth_year>5.0):
    print("pass")
else:
    print("fail")
```

fail

```
In [ ]: # and :  
# if(True and False and True ):  
# if all true : true  
# if anyone false : false
```

```
In [ ]: # or :  
# we are providing multiple conditions inside if and anyone condition result is true then or give true result .  
# we are providing multiple conditions inside if and all conditions result is false then or give false result .
```

```
In [2]: alp=input("enter a alphabat")  
if(alp=="a" or alp=="e" or alp=="i" or alp=="o" or alp=="u"):  
    print('vowel')  
else:  
    print("consonent")
```

consonent

```
In [6]: # college test : 50%  
# internal 1 :  
# internal 2 :  
# internal 3 :  
  
internal1=int(input('enter first internal marks '))  
internal2=int(input("enter second internal marks "))  
internal3=int(input("enter third internal marks "))  
  
total_marks=int(input("enter internal total_marks "))  
  
half_marks=total_marks/2  
  
if(internal1>half_marks or internal2>half_marks or internal3>half_marks):  
    print("pass")  
else:  
    print("fail")
```

pass

```
In [9]: # find a number is divided from 9 or it is even number .  
num=int(input("enter a number "))  
if(num%2==0 or num%9==0):
```

```
    print("number is even or number is divided by 9")
else:
    print("condition is not fullfilling")
```

condition is not fullfilling

In [11]: *# not : it is used to turn the result .*

```
age=int(input("enter age : "))
if(age>18):
    print("you can play this game ")
else:
    print("you are not eligible ")
```

you can play this game

In [13]:

```
age=int(input("enter your age"))
print(age>18)
print(not(age>18))
if(not(age>18)):
    print("you are not eligible to play this game ")
else:
    print("you are eligible ")
```

True

False

you are eligible

In [18]:

```
# arihtmetic
# assignment
# relative
# Logical .

# condition :
# nested condition and multiple condition .

# multiple condition : elif
# number : greater than zero : positive
# number : less than zero : negative
# number : equal to zero : zero

num=int(input("enter a number "))
```



```
if(num>0): # condition true: stop
    print("positive ")
elif(num<0): # condition true : stop
    print("negative")
else: # condition : else
    print("zero")
```

zero

```
In [20]: num=int(input('enter a number '))
if(num>40): # condition true :
    print("number is greater than 40")
elif(num>20): # condition true :
    print("number is greater than 20")
else:
    print("number is greater than 0")
```

number is greater than 40

```
In [21]: # percentage :
p=float(input("enter your percentage "))
if(p>90):
    print("Grade A")
elif(p>80):
    print("Grade B")
elif(p>70):
    print("Grade C")
elif(p>60):
    print("Grade D")
elif(p>50):
    print("Grade E")
else:
    print("fail")
```

Grade C

```
In [32]: # find the greatest of three numbers .

# all three numbers are different
num1=int(input("enter first number"))
num2=int(input("enter second number"))
num3=int(input("enter third number "))
```

```
# num1==num2 and num1 > num3
# num1==num3 and num1 > num2
# num2==num3 and num2 > num1
# num1==num2 and num2==num3

if(num1==num2 and num2==num3):
    print("all three numbers are equals ")
elif(num1==num2 and num1>num3):
    print("num1 and num2 are equal and greater than num3 ")
elif(num1==num3 and num1>num2):
    print("num1 and num3 are equal and greater than num2 ")
elif(num2==num3 and num2>num1):
    print("num2 and num3 are equal and greater than num1 ")
elif(num1>num2 and num1>num3):
    print('num1 is greatest ')
elif(num2>num1 and num2>num3):
    print("num2 is greatest")
else:
    print("num3 is greatest")
```

num1 is greatest

In []: