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(Artifical 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 , rasberry 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 , dimension redcutoin , Anamoly reduction
# semi supervised :
# reinforcement .
```

In [ ]:
```
# installation of anconda .  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 navigtor  .
# 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  + imagnary 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)
```

```
4.444444444444445
```

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

```
20
```

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

```
64
```

In [1]:
```
# complex : real + imagnary

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 : 01,2,3,4
# %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 equql .
# != : both side values must be different .


# find the geratest 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 :  mutliple condition  inside if   .
```

```
# we provide mutliple 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 [3]:

```
# find a given triangle is isosceles, equilateral, scalene and tell as well as triangle is possible or not for given sides  .

side1=int(input("enter first side of triangle "))
side2=int(input("enter second side of triangle "))
side3=int(input("enter third side of triangle "))

# triangle possible or not .
if(side1+side2>side3 and side1+side3>side2 and side2+side3>side1):
    print("triangle is possible ")
else:
    print("triangle is not possible ")


# triangle type .
if(side1==side2 and side2==side3):
    print("equilateral")
elif(side1==side2 or side1==side3 or side2==side3):
```

```
    print("isosceles")
else:
    print("scalene")
```

```
triangle is not possible
isosceles
```

In [13]:
```
# nested condition :  condition inside condition .

# we use condition inside condition  .

# find a number is even and divide by 7 .

num=int(input("enter a number "))
if(num%2==0):  # number cofirm even . (true )
    if(num%7==0):   # true true
        print("number is even and divided by 7 .")
    else:   #  true   false
        print("number is even but not divisible by 7 ")
else:
    if(num%7==0): # false   true
        print("number is odd but divided by 7 . ")
    else:   # false     false
        print("neither number is even nor number is divided by 7  . ")
```

```
number is odd but divided by 7 .
```

In [8]:
```
side1=int(input("enter first side of triangle "))
side2=int(input("enter second side of triangle "))
side3=int(input("enter third side of triangle "))

# triangle possible or not .
if(side1+side2>side3 and side1+side3>side2 and side2+side3>side1):
    if(side1==side2 and side2==side3):
        print("triangle is possible and type is equilateral")
    elif(side1==side2 or side1==side3 or side2==side3):
        print("triangle is possible and type is isosceles")
    else:
        print("triangle is possible and type is scalene")
else:
    print("triangle is not possible ")
```

```
triangle is possible and type is equilateral
```

In [22]:
```
# atm pin :

pin=int(input("enter atm pin"))
balance=4000
if(pin==3434):
    choice=input("enter choice")
    if(choice=="withdraw"):
        rupees=int(input("enter rupees"))
        if(rupees<balance):
            print("with draw has been successful")
            balance=balance-rupees
            print("Now your balance is : ",balance)
        else:
            print("balance is insufficient")
    elif(choice=="deposit"):
        rupees=int(input("enter rupees"))
        balance=balance+rupees
        print("Now your balance is : ",balance)
    elif(choice=="displayBalance"):
        print("your current balance is : ",balance)
    else:
        print("choice must be 1 . withdraw , 2 .deposit  3 . displayBalance ")
else:
    print("pin invalid ")
```

```
with draw has been successful
Now your balance is :  1000
```

In [27]:
```
pin=int(input("enter pin"))
balance=5000
if(pin==2745):
    print("--- process continue -----")
    choice=input('enter choice ')
    if(choice=="withdraw"):
        rupees=int(input("enter rupees"))
        if(rupees <= balance):
            balance-=rupees
            print("withdraw has been successful")
            print("your balance is : ",balance)
```

```
        else:
            print("balance is insufficient")
    elif(choice=="deposit"):
        rupees=int(input("enter rupees"))
        balance+=rupees
        print("your balance is : ",balance)
    elif(choice=="checkBalance"):
        print("your balance is : ",balance)
    else:
        print("enter only withdraw ,deposit , checkBalance")
else:
    print("---- invalid pin ----")
    print("---- reenter your pin ----- ")
```

```
--- process continue -----
balance is insufficient
```

In [ ]:
```
# find a given year is leap year or not  : assignment .
```