i/p 2 no.s eg & o/p gt.

if both no.s are same.

o/p equal

x > y ① y > x ② x == y ③

Nested If -else

PS2.PY

```
print ("enter 2 no.s")
x, y = int(input()), int(input())
if (x>y):
    print(f"{x} is gt")
else:
    if y>x:
        print(f"{y} is gt")
```

x	y
10	5

enter 2 no.s:
10 ↵
5 ↵
10 is gt.

x	y
20	80

enter 2 no.s:
20 ↵
80 ↵
80 is gt.

```
    else :
        print ("equal")
    # end : if-else (inner)
# end : if-else (outer)
```

x y
10 10

enter 2 nos
10 ↵
10 ↵
equal

Disad of if-else :

```
if c1 :
    block 1
else :
    if c2 :
        block 2 ;
    else :
        if c3 :
            block 3
        else :
            if c4 :
                block 4
            else :
                if c5 :
                    block 5
                else :
                    block 6
                # end : if-else
            # end : if-else
        # end : if-else
    # end : if-else
# end if-else
```

if - elif - else

syntax :

```
if c1:
    block 1
elif c2:
    block 2
elif c3:
    block 3
elif c4:
    block 4
elif c5:
    block 5
else :
    block 6
# end : if-elif
# next st
```

P83.py

```
print ("enter 2 no.s :")
x, y = int(input()), int(input())
if x > y:
    print(f"{x} is gt")
```

x y
10 5

enter 2 no.s:
10 ↵
5 ↵
10 is gt

```
elif  y > x :
—print ( f "{y} is gt")

else :
—print ( "equal ")
# end if - elif
```

x	y
20	80

enter 2 nos
20 ↵
80 ↵
80 is gt.

x	y
10	10

enter 2 no:s
10 ↵
10 ↵
equal.

```
if c1 :
— if c2 :
— — block_A
— else :
— — block_B
—# end : if - else
else :
— block_C
# end if - else
```

↑
Appln

[ex4.py]

```
x = int (input ("enter a no.: "))
if x > 0:
    print (f"{x} is +ve")
elif x < 0:
    print (f"{x} is -ve")
else:
    print ("zero")
# end: if-elif
```

```
x
30
enter a no: 30↵
30 is +ve
```

```
x
-10
enter a no. : -10↵
-10 is -ve
```

```
x
0
enter a no. : 0↵
zero
```

i/p pc & sc

pc	sc	o/p
500	800	profit : 300 Rs

pc	sc	o/p
500	400	Loss : 100 Rs

pc	sc	o/p
500	500	No P / No L

if - elif

P85.py

```
ch = int(input("1: India \n 2: Japan \n choice:"))

if ch == 1:
    print("New Delhi")

elif ch == 2:
    print("Tokyo")

else:
    print("wrong choice")

# end : if - elif
```

Menu
1: India
2: Japan
choice: 8 ↵
wrong choice

P86.py

```
x = int(input("x : "))

ch = int(input("1: square \n 2: cube \n choice:"))

if ch == 1:

print(f"square : {x**2}")

if ch == 2:
```

— print (f" cube : {x * * * 3} ")

o/p

else:
— print (" wrong choice ")

end : if → elif.

o/p

x : 5 ↵
1: square
2 : cube
choice : 2 ↵
cube : 125

Ass i/p 2 no.s

x	y
100	50

+ : add
- : sub
* : mult
/ : div

choice: + ↵
add is 50

p87.py

```
x = 10
print(f"{x}")
# print(f"{y}") # error
# print(f"{Hi}") # error
print(f"{'hi'}")
print(f'{"hi"}')
```

o/p

10
hi
hi

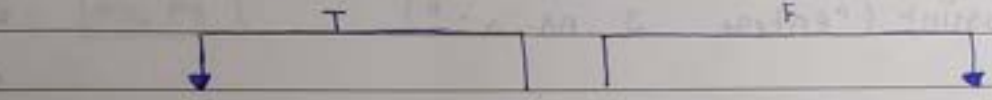
p88.py

```
x = in(input("enter a no.:"))
"""
if x > 0 :
    print(f"{x} is +ve")

else :
    print(f"{x} is -ve")

# end : if - else
"""
if x > 0 : print(f"{x} is +ve")

else : print(f"{x} is -ve")
```

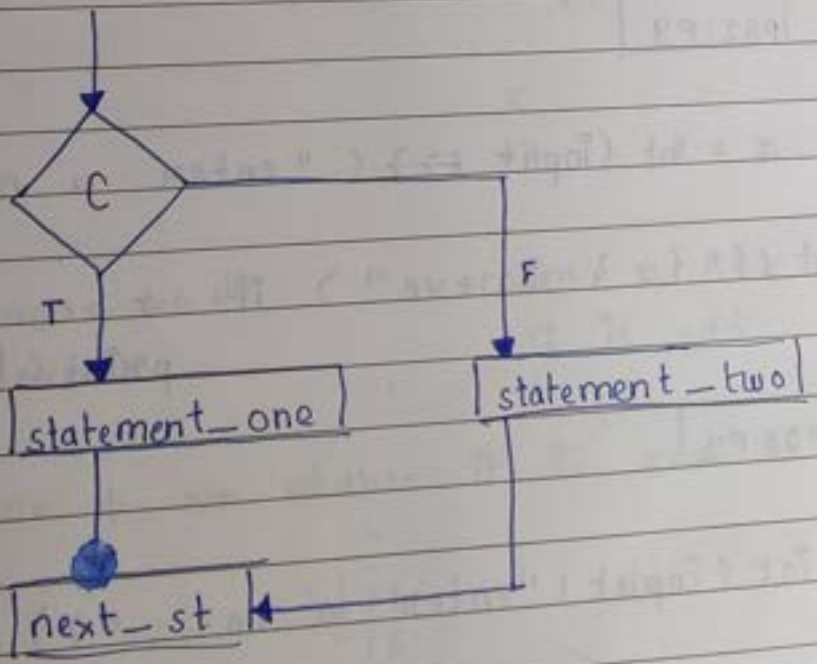
prg.py

```
x = int(input("enter a no.:"))
if x>0: print(f"{x} is +ve")
elif x<0 : print(f"{x} is -ve")
else : print("zero")
```

Single line if-else



Flow chart



x y
10 5

pg0.py

```
print ("enter 2 no.s :")
x, y = int(input()), int(input())
print(f"{x} is gt") if x>y else print(f"{y} is gt")
```

enter 2 no.s
10 ↵
5 ↵
10 is gt

pg1.py

```
print ("enter 2 no.s :")
x, y = int(input()), int(input())
print(f"{x if x>y else y} is gt").
```

x y
20 10
enter 2 no.s
10 ↵
20 ↵
20 is gt

pg2.py

```
x = int(input()) ("enter a no. :"))
print(f"{x} is +ve") if x>0 else
                print(f"{x} is -ve")
```

pg3.py

```
x = int(input("enter a no. :"))
print(f"{x} is {'+ve' if x>0 else '-ve'}")
```

x
30
enter a no. : 30 ↵
30 is +ve

x
-10
enter a no. : -10 ↵
-10 is -ve

p94.py

x = int (input ("enter a no. :"))

print (f "{x} is even") if x % 2 == 0 else
print (f "{x} is odd")

x
40
enter a no. : 40 ↵
40 is even

x
17
enter a no : 17 ↵
17 is odd

i/p a no & o/p whether it is even or odd

```
   20
2 | 40
  -40
   0  - even
```

```
   4
2 | 17
  -16
   01 - odd
```

Ass. 1] Solve in 1 print
2] Solve without using %
[// * + -]
3] Solve using IF - else.

I/P a no. & O/P whether it is +ve, -ve or zero

(Nested)

p.25.py

```
x = int (input ("enter a no. :"))

print ( f"{x} is +ve") if x >0 else
      print(f" {x} is -ve") if x < 0 else print ("zero")
```

x	x	x
30	-10	0

enter a no. : 30 ↵ enter a no. : -10 ↵ enter a no : 0 ↵
30 is +ve -10 is -ve zero

Logical operators

and
or
not

C1	C2	and
T	T	T
F	T	F
T	F	F
F	F	F

all conditions are T: T
otherwise : F

a > b and c > d

x > y and x > z

↓

y < x and x > z

↓

y < x > z

pg6.py

```
# gt of 3 no.s using and
— print ("enter 3 no.s :")
x, y, z = int(input()), int(input()), int(input())
if x > y and x > z : # y < x > z
— print(f"{x} is gt")
elif : y > x and y > z : # x < y > z
— print(f"{y} is gt")
else :
— print(f"{z} is gt")
# end : if - elif
```

# s	x	y	Z
	10	3	5

enter 3 no.s:
10 ↵
3 ↵
5 ↵
10 is gt.

---

x y z
10 30 5
enter 3 no.s:
10 ↵
30 ↵
5 ↵
30 is gt.

---

x y z
10 30 50
enter 3 no.s:
10 ↵
30 ↵
50 ↵
50 is gt

Ans i/p solve in 3 conditions.

pgm.py

range checking pgm

i/p bill

1 - 100 : no discount
101 - 200 : 5% dis
201 - : 10 % dis

```
bill = int (input ("enter bill : "))

if bill >1 and bill <=100 :
    print ( " no discount")

elif bill >= 101 and bill <=200 :
    print ("5 % discount")

else :
    print ( " 10 % discount")

# end : if - elif
```

bill
50

bill
150

bill
500

enter bill : 50↵

en

i/p per	o/p
< 40	fail
40 - 50	Pc
51 - 60	Sc
61 - 70	Fc
71 -	Dist

i/p no	o/p
single digit	small
2 digit	lar
3 or more	V. lar

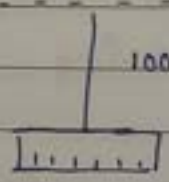
logical or

C1	C2	or
F	F	F
T	F	T
F	T	T
T	T	T

all conditions are F : F
otherwise : T

eg7.py

Essel world
Free-Fall



<7 >60

```
age = int(input("enter age :"))
if age <7 or age >60 :
    print("entry is not allowed")
else:
    print("entry is allowed")
# end : if-else
```

age
ent 5
enter age : 5 ↵
entry is not allowed

age
65
enter age : 65 ↵
entry is nt ald

age
20
enter age : 20↵
entry is ald

Ass # solve in 2 lines
solve in 1 lines
solving using and
gt of 3 no·s using or

```
if __ or __ :
    __ if __ :
    __ __ ____
__ else :
__ __ ____
else :
__ ____
```

pgr.py

gt of 2 no·s using not

```
print ("enter 2 no·s :")
x, y = int (input ()) , int (input ())
if not x > y :
    print (f"{y} is gt")
else :
    print (f"{x} is gt")
```

Add : if-else

log1	x	y
	10	5

enter 2 no.s :
10 ↵
5 ↵
10 is gt

x	y
20	80

enter 2 no.s :
20 ↵
80 ↵
80 is gt

* logical not

C1	not (opposite)
T	F
F	T

i/p x & y co-ordinates

o/p quadrant

(-,+)	II	I	(+,+)
(-,-)	III	IV	(+,-)

pgg.py

```
s1 = "Raj"
s2 = s1.lower()
print (s1, s2)
s3 = "amit"
s4 = s3.lower()
print (s3, s4)
```

s1	s2
"Raj"	"raj"

s3	s4
"amit"	"amit"

upper

o/p
Raj raj
amit amit

P100.py

print ("b" in "abcdef") o/p
True
print ("x" in "abcdef")
False

vowel
a e i o u
A E I O U

P101.py

```
ch1 = input ("enter char :")
ch2 = ch1.lower()
if ch2 in "aeiou":
    print (f"{ch1} is a vowel")
else:
    print (f"{ch1} is not a vowel")
# end: if-else
```

ch1	ch2
"e"	"e"

enter char: e ↵
e is a vowel

ch1	ch2
"I"	"i"

enter char: I ↵
I is a vowel

ch1	ch2
"d"	"d"

enter char: d ↵
d is not a vwl

P102.py

```
ch1 = input ("enter char :")
ch2 = ch1.lower()
if ch2 not in "aeiou":
    print(f"{ch2} is not a vowel")
else:
    print (f"{ch1} is a vowel")

# end : if-else
```

P103.py

```
ch1 = input ("enter char :")
ch2 = ch1.lower()
if ch2 == "a" or ch2 == "e" or ch2 == "i" or
        ch2 == "o" or ch2 == "u":
    print (f"{ch1} is a vowel")
else:
    print (f"{ch1} is not a vowel")

# end : if-else
# C sln.
```

+=

int variable
increments value of var

variable += 1

p104.py

```
i, j, K = 1, 10, 25
print (i, j, K)

i += 1
j += 1
K += 1

print (i, j, K)
```

i	j	K
~~1~~	~~10~~	~~25~~
2	11	26

o/p

1 10 25

o/p

2 11 26

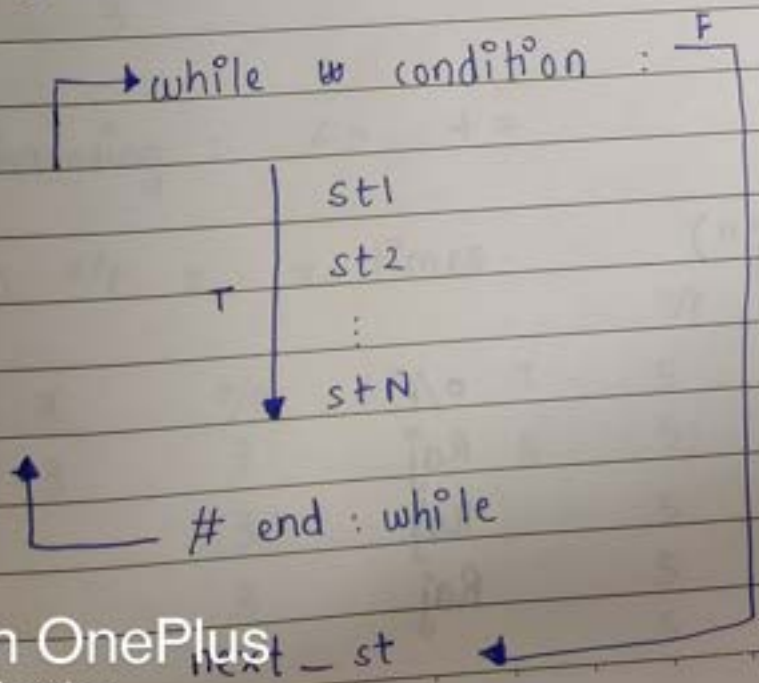
Loops / Iterations

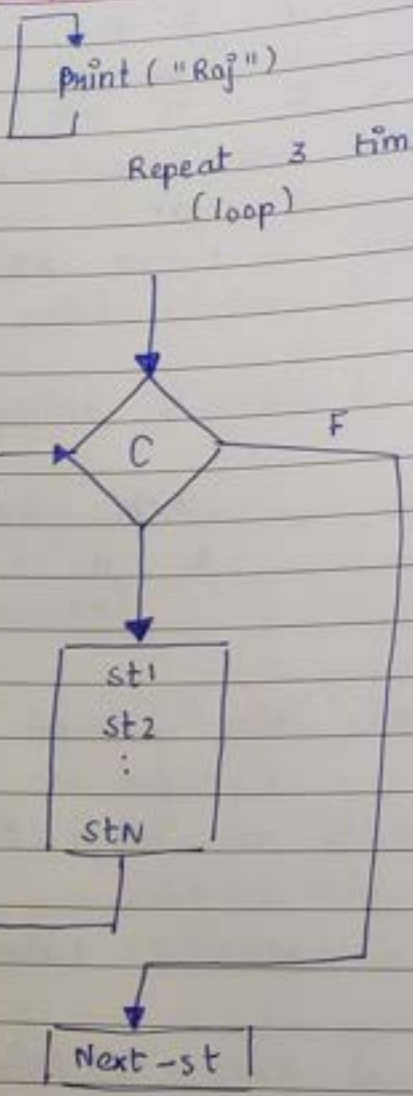
while

For

while loop :

Syntax





P105.py

```
i = 1
while  i <= 3 :
    print ("Raj")
    i += 1
# end : while
```

o/p
Raj
Raj
Raj

06/08/22
2:48 pm

i/p a no. in x ⇧
o/p all no.s from 1 to x

x	o/p
3	1
	2
	3

PROG.PY

```
x = int (input ("x:"))
i = 1
while i <= x :
    print (i)
    i += 1
# end : while
```

x	i
3	1
	2
	3
	4

o/p
x : 3 ↵
1
2
3

* increasing : <= +=

Ass ① o/p x x-times

x	o/p
3	3
	3
	3

x	o/p
5	5
	5
	5
	5
	5

⑤ o/p

10 # Raj
11 # Raj
:
20 # Raj

Hint:

```
i=10
while i<=20:
    print(
    i+=1
#end:while.
```

* decreasing : >= -=

i/p a no. in x ϕ
o/p all nos from x to 1

x	o/p
3	3
	2
	1

P107.PY

```
x = int(input("x:"))
i = x
while i>=1:
    print(i)
    i-=1
# end:while
```

x	i
3	~~3~~
	~~2~~
	1
	0

o/p

x:3 ↵
3
2
1

Ass@ solve by 1 var

① o/p all no:s from x1 to x2

x1	x2
5	8

o/p

5 inc
6
7
8

x1	x2
8	5

o/p

8 dec
7
6
5

Hint:

```
if x1 < x2 :
    __ while __ :
    __  __  # incr
    __  __  # <= += x=
    __ # end:while
else :
    __ while __ :
    __  __  # dcr
    __  __  # >= -=
    __ # end : while
# end : if -else.
```

i/p a no. in x ↓

o/p mul. table

x
5

x	i	m = x * i
5	1	5
5	2	10
	:	
5	10	50

x	i	m
8	1	8
	2	16
	3	24
	4	

|P108.py|

```
x = int (input ("x :"))
i = 1
while i <= 10 :
    m = x * i
    print (f"{x} * {i} = {m}")
    i += 1
#end : while
```

o/p

x : 8 ↵

8 * 1 = 8

8 * 2 = 16

8 * 3 = 24

⋮

8 * 10 = 80

Aw: solve in 2 var x & i.

i/p a no. in x & cal Σ of all nos from 1 to x

1 + 2 + 3 + ... x

x

4

i 1 + 2 + 3 + 4 : 10

sum

0

1

3

6

10

Page No.:
Date:
YOUVA

P109.py

```
x = int (input ("x: "))
i, sum = 1, 0
while i <= x :
    sum = sum + i
    i += 1
# end : while
print (f"sum : {sum}")
```

x	sum	i
4	~~0~~	~~1~~
	~~1~~	~~2~~
	~~3~~	~~3~~
	~~6~~	~~4~~
	10	5

o/p

x: 4 ↵

sum: 10

P110.py

```
x = int (input ("x : "))
sum = 0
i = 1
while i <= x :
    sum = sum + i ** 2   # i^2
    i += 1
# end : while
print (f"sum : {sum}")
```

x	sum	i
3	~~0~~	~~1~~
	~~1~~	~~2~~
	~~5~~	~~3~~
	14	4

o/p

x: 3 ↵

sum: 14

Ass 1] $1^3 + 2^3 + 3^3 + \dots x^3$

2] $2 + 4 + 6 + \dots x$

3] $1 + 3 + 5 + \dots x$

4] $7 + 14 + 21 + \dots 70$

i/p a no. in x & cal factorial

$x! = 1 \times 2 \times 3 \dots x$

x

4

$4! = 1 \times 2 \times 3 \times 4 : 24$

i

f

1

+

2

6

24

P111.py

```
x = int (input ("x : "))
f = 1
i = 1
while i <= x :
    f = f * i
    i += 1
# end . while
print ( f " factorial : {f} ")
```

x	f	i
4	1	1
	+	+
	1	2
	2	3
	6	4
	24	5

o/p

x : 4 ↵

factoria : 24

20 # Raj (even)
21 # Jim (odd)
22 # Raj
23 # Jim
⋮
29 # Jim
30 # Raj

p112.py

```
i = 20
while i <= 30:
    if i % 2 == 0:
        print(f"{i} # Raj")
    else:
        print(f"{i} # Jim")
    # end : if-else
    i += 1
# end : if-else
```

i
~~20~~
21
~~22~~
23

o/p

20 # Raj
21 # Jim
⋮
30 # Raj

Ans: 1] single line if-else

2] $1+2^3+3+4^2+\ldots$ upto x

3] $1-2+3-4+\ldots$ upto x

4] $1+2+3^4+4^2+\ldots$ upto x

10 # Raj
11 # Jim
12 # Amit
:
20 # Jim
21 # Amit
22 # Raj

i % 3
0 1 2
A J R

i = i + 10
↓
i += 10

i = i + 1
↓
i += 1

sum = sum + i ** 2
↓
sum += i ** 2

f = f * i
↓
f *= i

Loop control statement

→ break
continue

break st.

Syntax

while condition_one : T

_

_

if condition_two : F

_

_

_

break

end: if

_

_

end: while

next_st

→ while condition_one : T

_

_

if condition_two: T

_

break
if # end : if

end : while
next st

pgm3.py

```
i = 1
while i**3 <= 100 :
    print (i)
    if i == 3:
        break
    # end : if
    i = i + 1
# end : while
```

o/p
1
2
3

pgm4.py

Menu - Driven pgms

```
print ("enter 2 nos :")
x, y = int (input()), int (input ())

while True:
    ch = input("+ : Add \n - : Sub \n E: Exist \n choice:")
    if ch == "+":
```

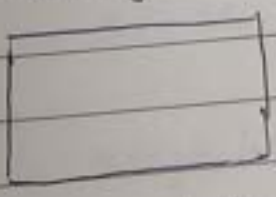
```
        print (f"Add is {x+y}")
    elif ch == "-":
        print (f"sub is {x-y}")
    elif ch in "eE":
        break
    else:
        print ("wrong choice")
    # end: if-elif
# end: while
print ("Pgm ends")
```

x	y	ch
100	70	"+" "-" "*" "e"

enter 2 nos:
100 ↵
70 ↵
+ : Add
- : Sub
E: Exit
choice: - ↵
sub is 30

: $ ↵

wrong choice



: + ↵

Add is 1to

pgm ends

Ass
+ : Add
& - : Sub
* : Mul
/ : Div
% : Rem
x : Exit
choice:

for loop → range

range syntax:
range (sv, ev)
sv : start - value
ev : end - value

generates all no's from
sv to ev - 1

range (5, 8)
5 6 7

range (101, 104)
101 102 103

range (ev)

↓

0 .... ev-1

range (5)

↓

0 1 2 3 4

for loop → range

range syntax:

range (sv, ev, incr/dcr offset)

range (5, 8, 1)

5 6 7

range (7, 4, -1)

7 6 5

range (10, 16, 2)

10 12 14

range (30, 50, 5)

30 35 40 45

range (100, 92, -2)

98 96 94

P115.py

```
for i in range (5,8) : # 5 6 7
    print (i)
# end : for
```

i
5
6
7

o/p
5
6
7

P116.py

```
for i in range (30,27,-1) : # 30 29 28
    print (i)
# end : for
```

i
30
29
28

o/p
30
29
28

P117.py

```
for x in range (5, 51, 5) : # 51 10 20 25 ... 50
    print (x)
# end : for
```

o/p
5
10
20
25
:
50

P118.py

```
for y in range (1, 10, 2):
    print (y)
# end : for
```

o/p
1
3
5
7
9

P119.py

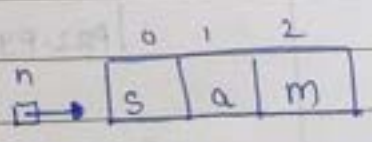
```
for ____ in range (3): # 0 1 2
    print ("Raj")
# end : for
```

o/p
Raj
Raj
Raj

P120.pyl

```
n = " sam"
print ( sam )
```

o/p
sam




```
print (n[0])
print (n[1])
print (n[2])
```

o/p
s
a
m

```
l = len (n) # length
print (f" {n} has {le} chars ")
```

o/p
sam has 3 char

```
print (f" {n} has {len(n) chars ")
```

o/p
sam has 3 char

pr1.py

```
n = input ("enter name : ")
'''
l
3 l = len(n)
for i in range (l) : # 0 1 2
    print (n[i])
# end : for
'''
```

i
0
1
2

o/p
enter name : sam ↵
s
a
m

```
for i in range (len(n)):
    print (n[i])
# end : for.
```

pr2.py

```
n = input ("enter name : ")
'''
x
"s"
"a"
"m"
for x in n: # s a m
    print (x)
# end : for
# for : each
'''
```

o/p
enter name : sam ↵
s
a
m

for x in n: print(x)

Ass eg: i/p rajesh

- raj esh
- RAJesh
- RaJeSh

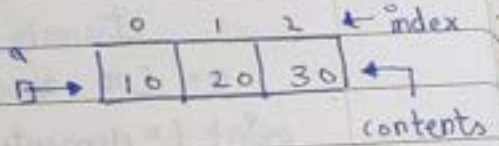
Hint
lower()
upper()

* collections / Pre-defined Data structures (D.S) of python.

list tuple set dict

list : []
ordered D.S
Index : ✓

p123.py




```
a = [10, 20, 30]

print(a)                    o/p
                            [10,20,30]

print(a[0])                 o/p
print(a[1])                 10
print(a[2])                 20
                            30

l = len(a)
print(f"length: {l}")       o/p
                            length: 3
```