

Plan de cours



Instructions
de base



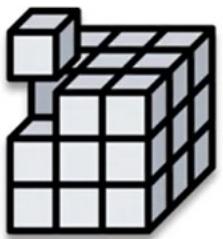
Structures
conditionnelles



Structures
répétitives



Fonctions
et modules



Structures
de données

Aa

Chaine
de caractères



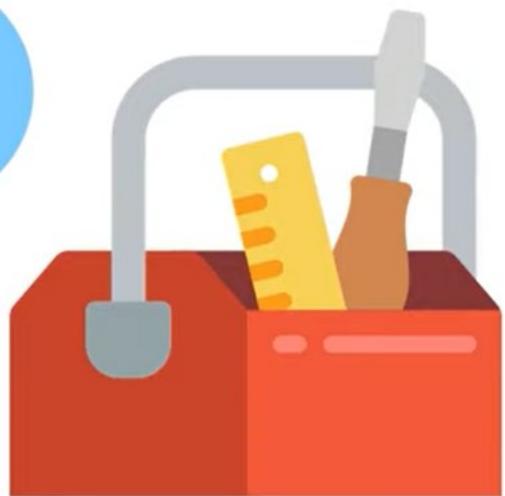
Gestion
des fichiers



Concepts
avancés

Fonction dans langage Python

1



Définir la
fonction

2



Appeler la
fonction

Définition de la fonction

```
def nom_fontion ( arg1 , arg2 , ... ) :  
    Instruction1  
    Instruction2  
    ...  
    return resultat
```

Définition de la fonction

Nom de fonction

Arguments de fonction

```
def nom_fonction ( arg1 , arg2 , ... ) :
```

Instruction1

Instruction2

...

```
return resultat
```

Deux points

Traitement

Résultat
retourné

Mot-clé def (define)

```
def afficher ():
```

```
    x = 2
```

```
    print ( x )
```

```
afficher ()
```

Variable locale

```
def afficher ():  
    x = 2  
    print (x)  
afficher ()  
print (x)
```

La variable x est une variable locale. Elle est définie à l'intérieur de la fonction afficher.

2

NameError: name 'x' is not defined

```
y = 4
```

```
def afficher ():
```

```
    .  
    x = y
```

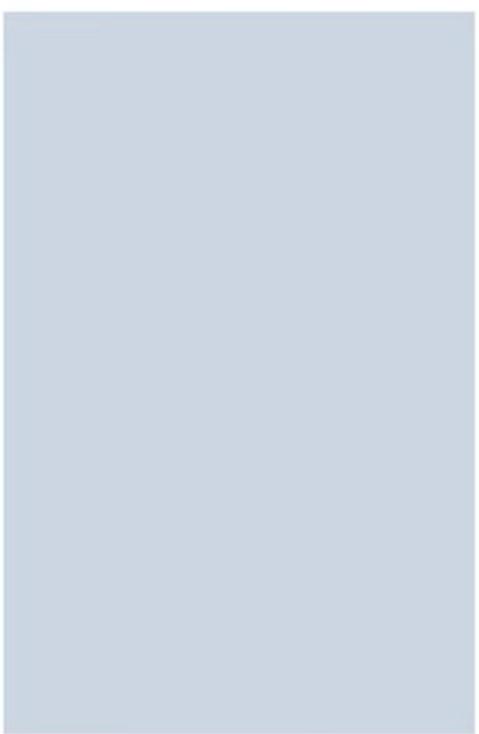
```
    print ( x )
```

```
afficher ()
```

```
print ( y )
```



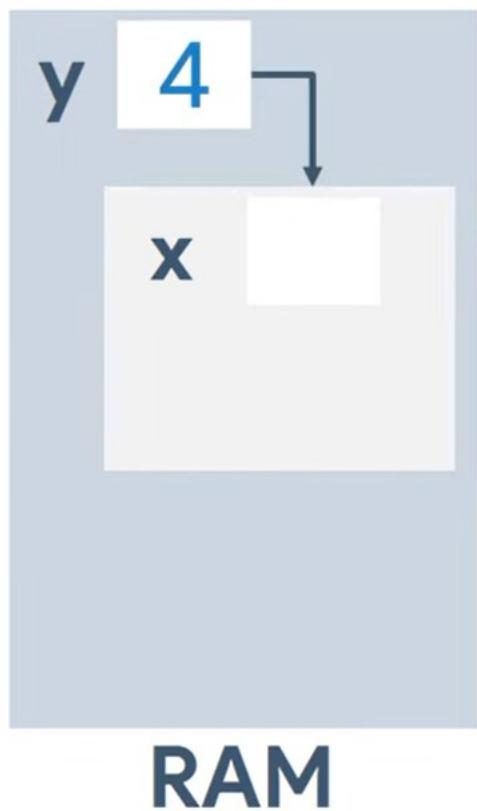
```
y = 4  
  
def afficher ():  
    x = y  
    print(x)  
  
afficher()  
print(y)
```



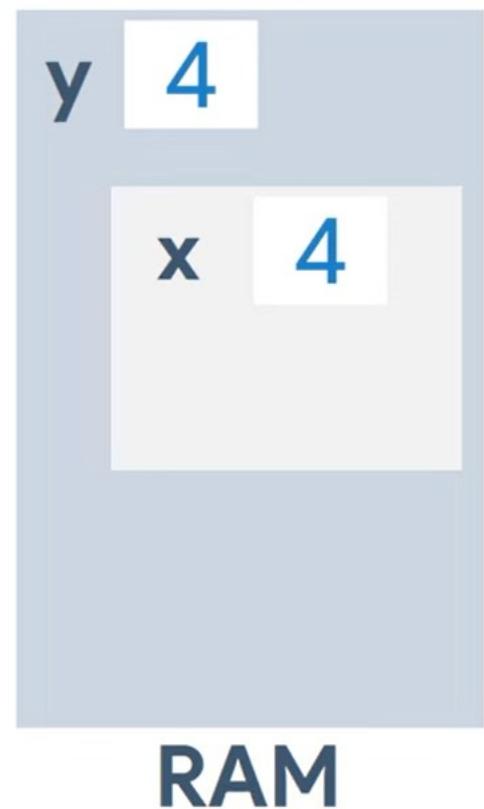
RAM



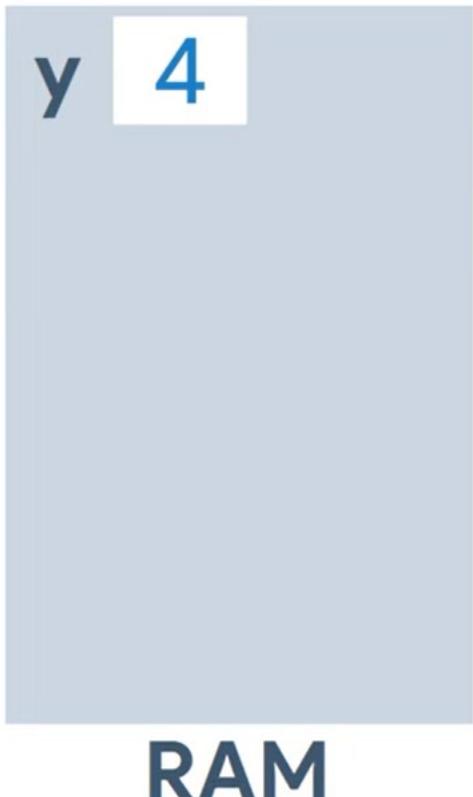
```
y = 4  
  
def afficher ():  
    x = y  
    print (x)  
  
afficher ()  
print (y)
```



```
y = 4  
def afficher ():  
    x = y  
    print (x)  
afficher ()  
print (y)
```

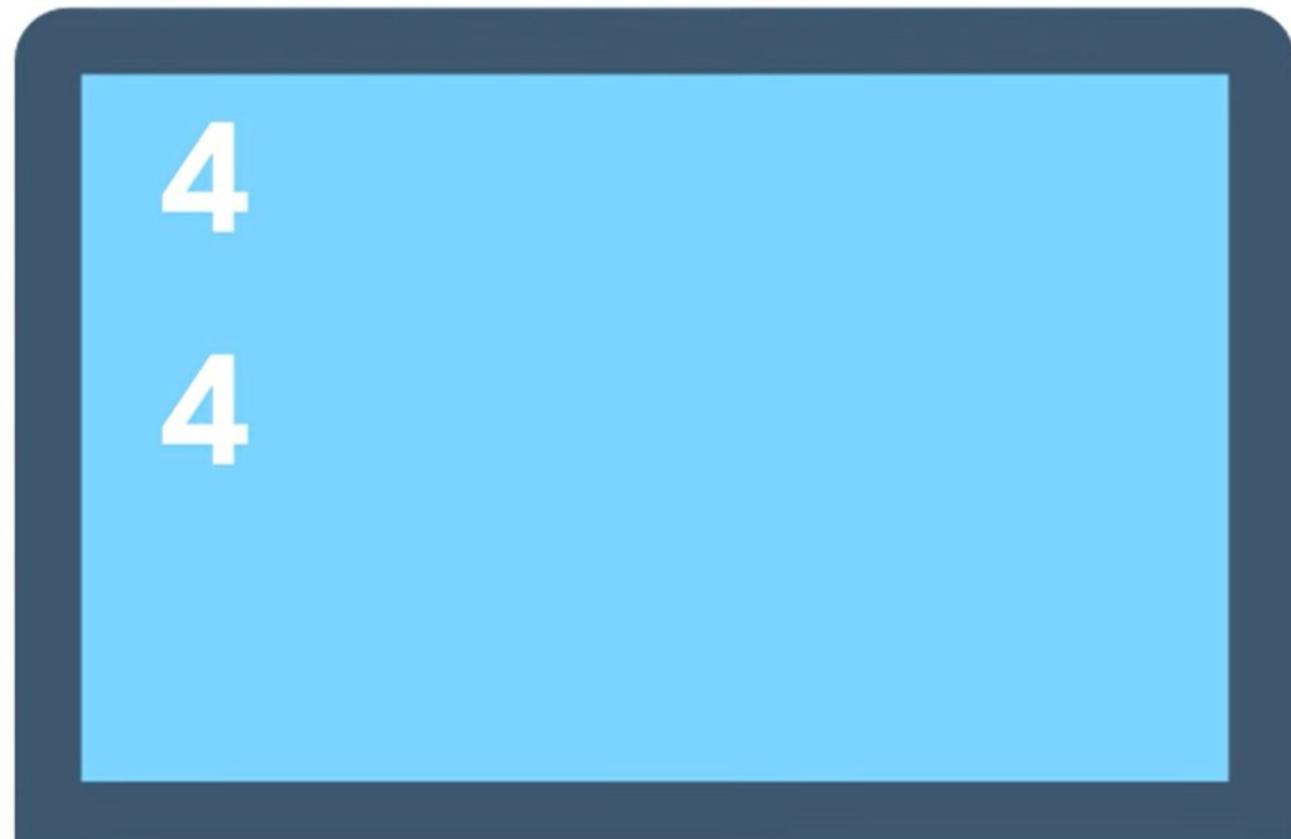
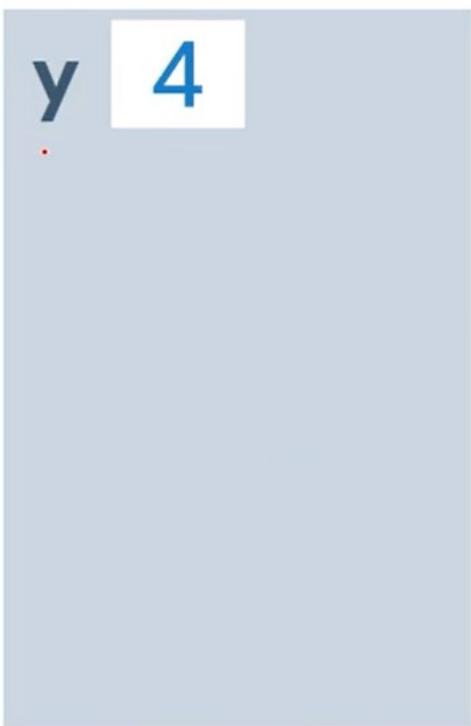


```
y = 4  
  
def afficher ():  
    x = y  
    print ( x )  
.afficher ()  
print ( y )
```



Variable globale

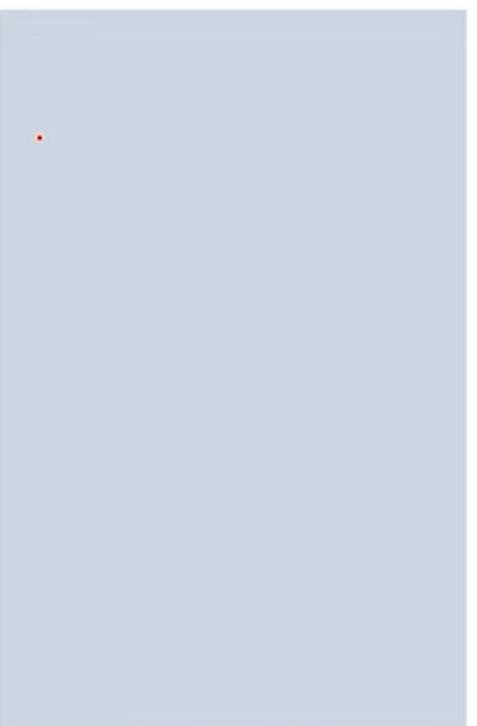
```
y = 4  
def afficher ():  
    x = y  
    print ( x )  
afficher ()  
print ( y )
```



La variable **y** est une variable globale. Elle est définie en dehors de la fonction **afficher**.

Variable globale

```
y = 4  
  
def afficher ():  
    y = 8  
    print ( y )  
  
afficher ()  
print ( y )
```



RAM



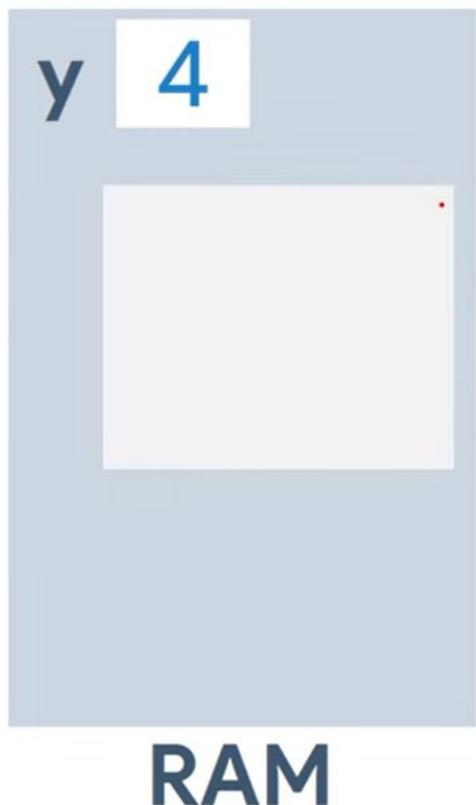
Variable globale

```
y = 4  
  
def afficher ():  
    y = 8  
    print (y)  
  
afficher ()  
print (y)
```



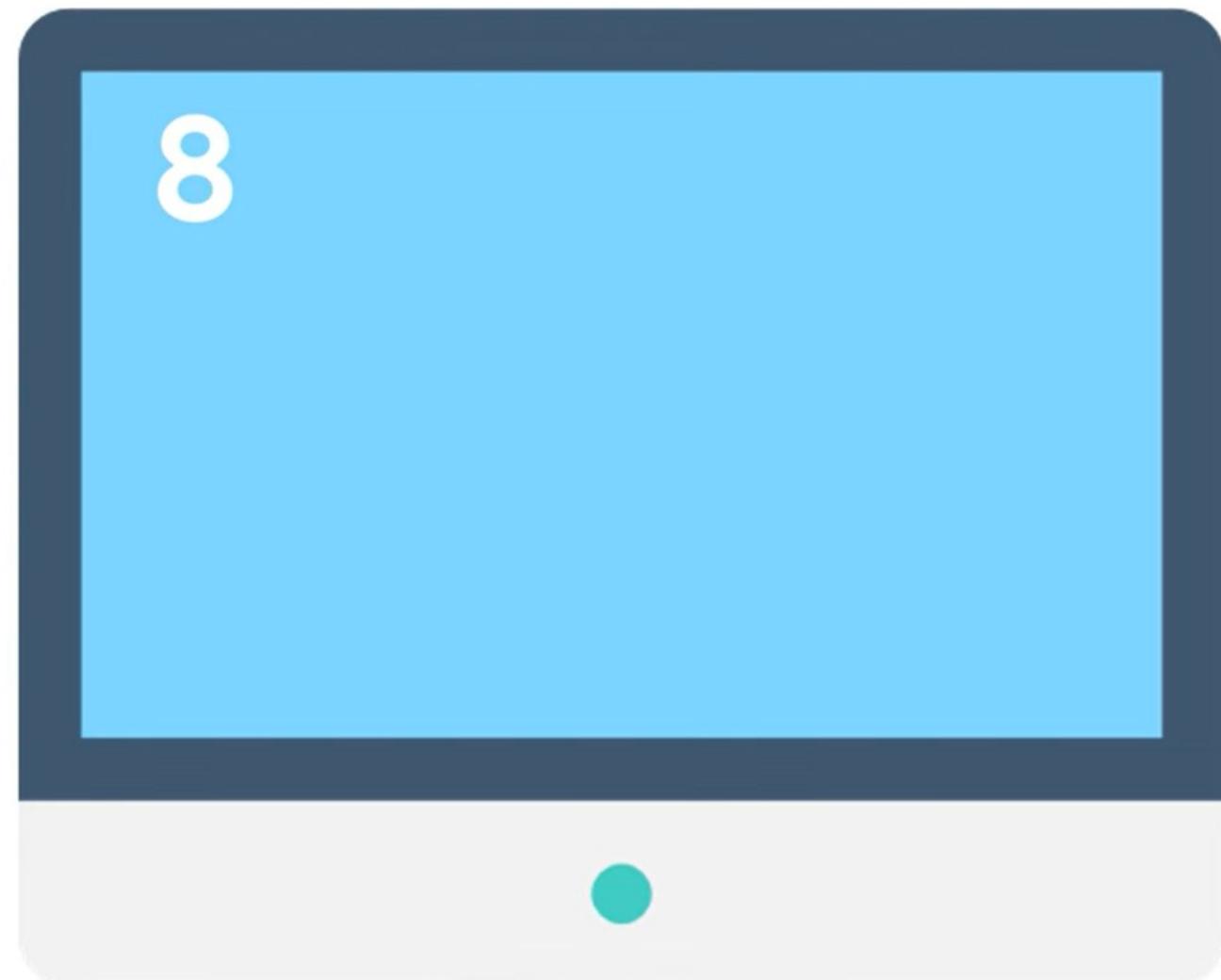
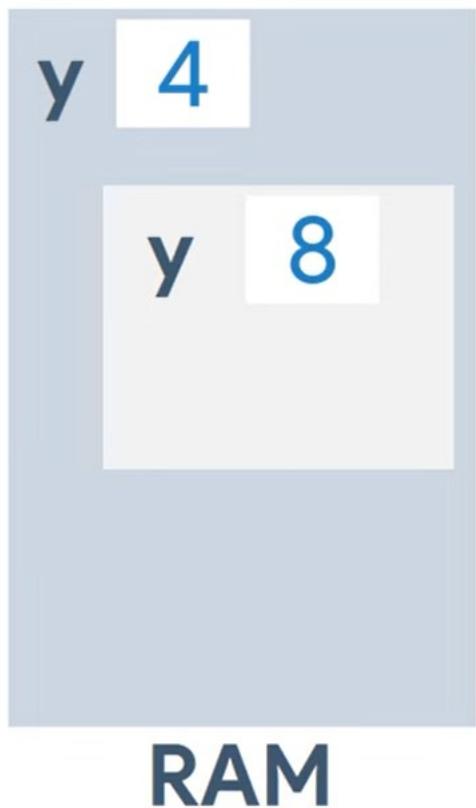
Variable globale

```
y = 4  
  
def afficher ():  
    y = 8  
    print (y)  
  
afficher()  
print (y)
```



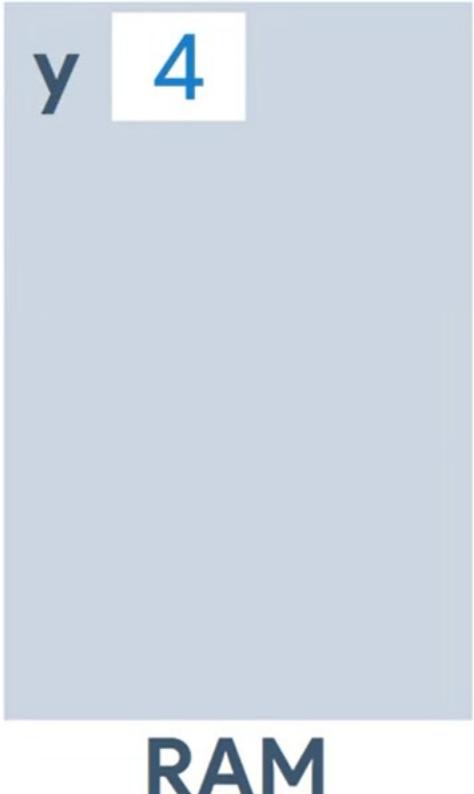
Variable globale

```
y = 4  
  
def afficher ():  
    y = 8  
    print (y)  
  
afficher()  
print (y)
```



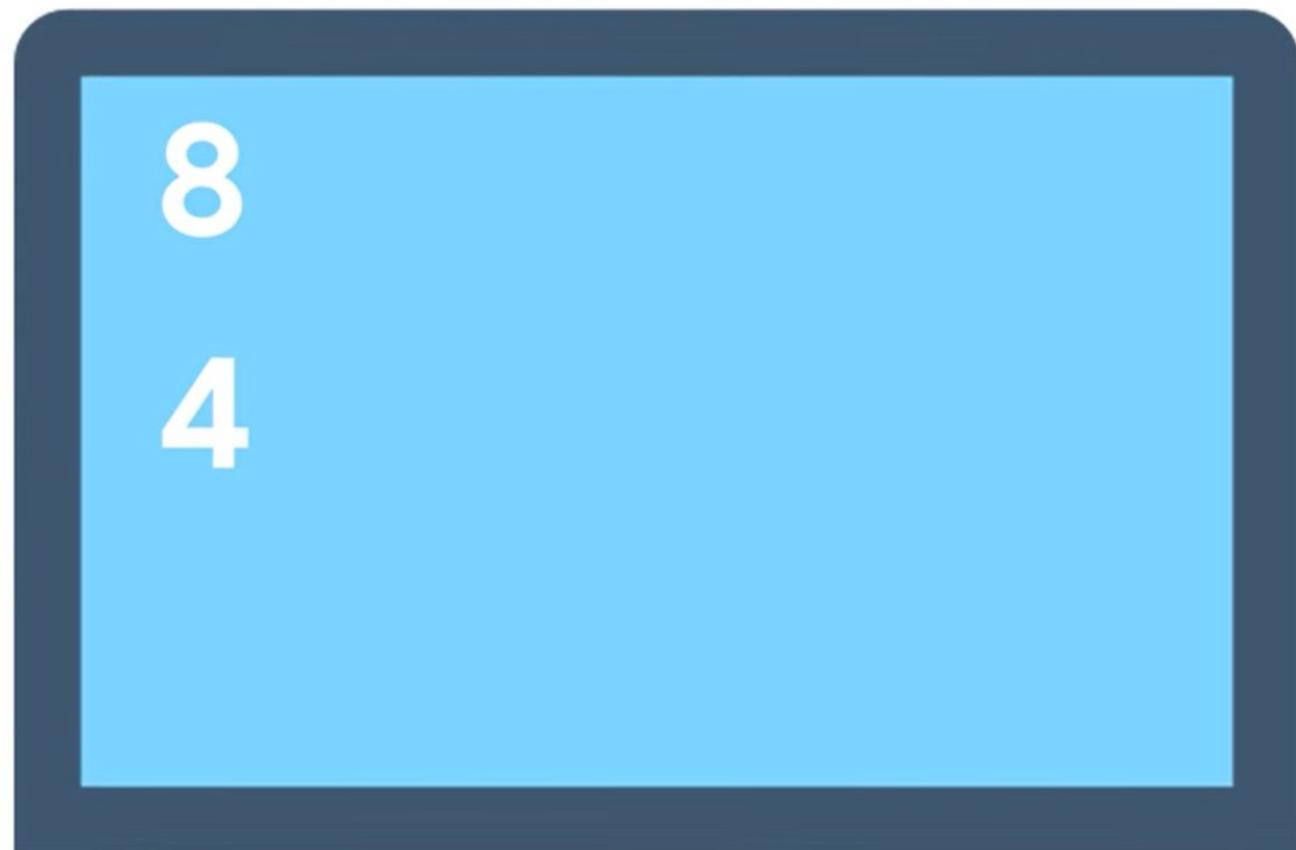
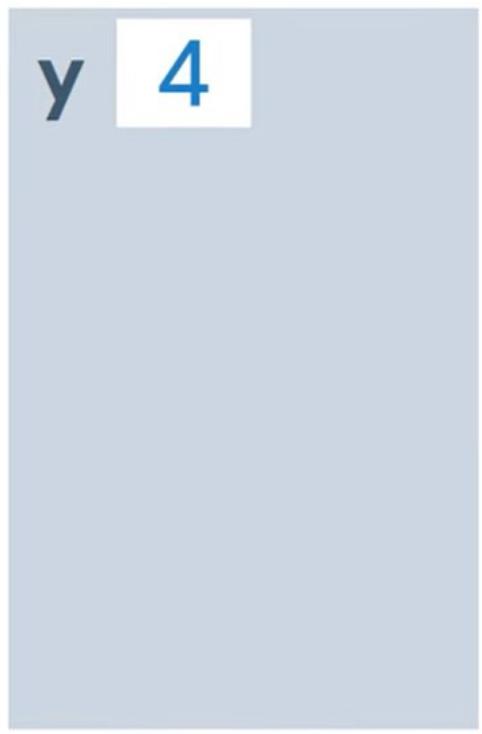
Variable globale

```
y = 4  
  
def afficher ():  
    y = 8  
    print (y)  
  
afficher ()  
print (y)
```



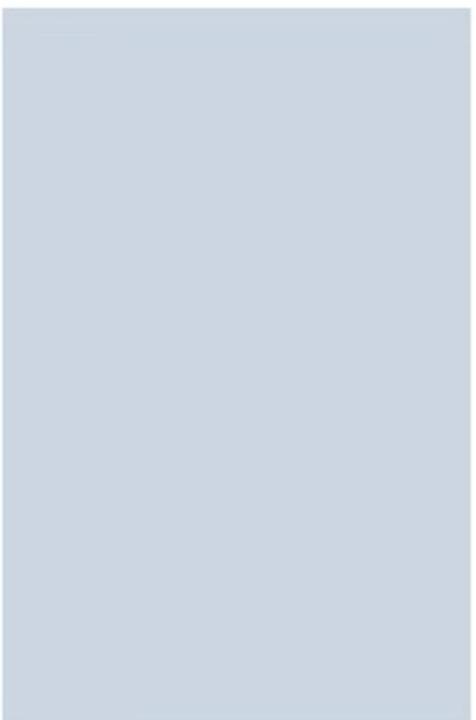
Variable globale

```
y = 4  
  
def afficher ():  
    y = 8  
    print(y)  
  
afficher()  
print(y)
```



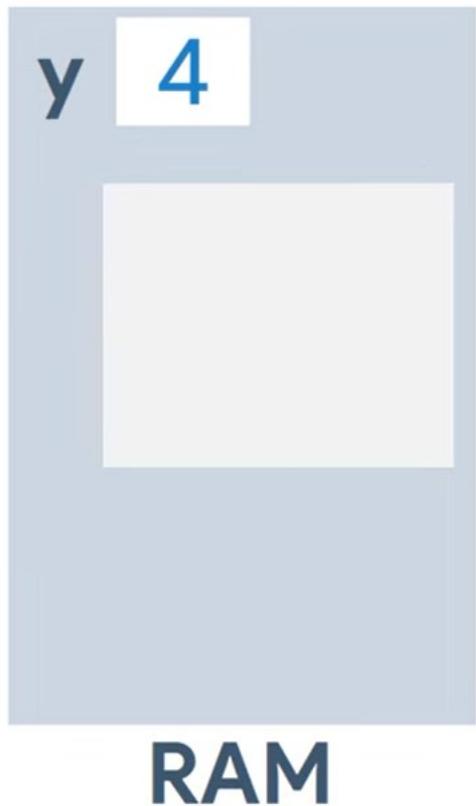
La variable globale `y` est accessible en lecture seulement à l'intérieur de la fonction `afficher`

```
y = 4  
  
def afficher ():  
    global y  
  
    y = 8  
  
    print ( y )  
  
afficher ()  
  
print ( y )
```



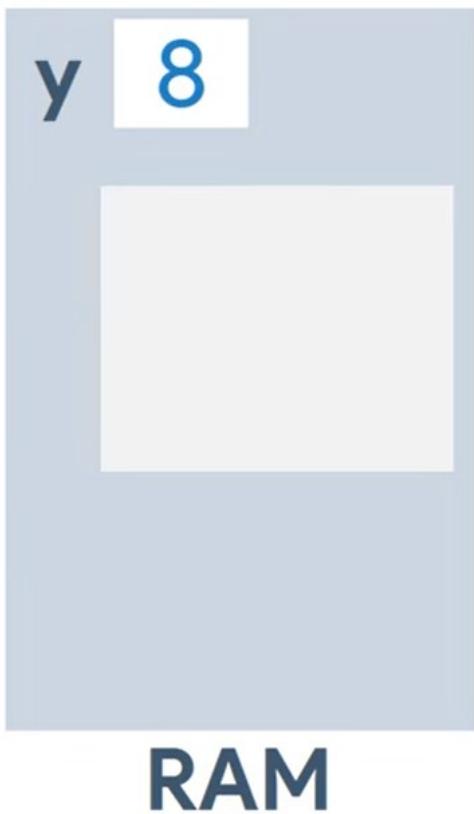
Mot clé **global**

```
y = 4  
  
def afficher ():  
    global y  
    y = 8  
    print (y)  
  
afficher()  
print (y)
```



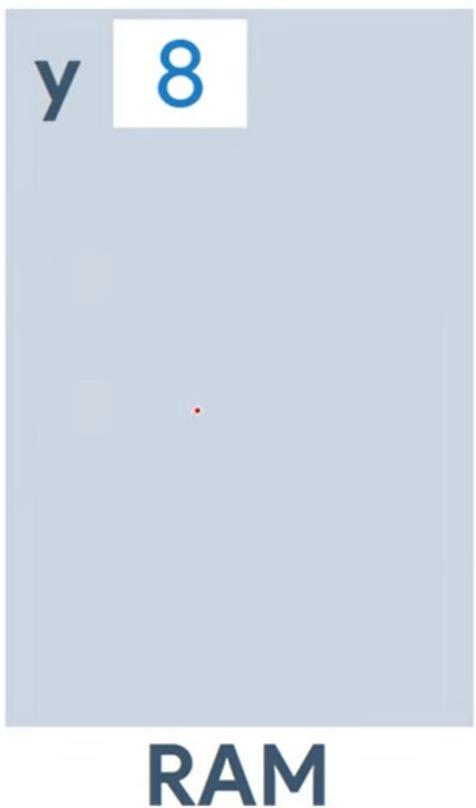
Mot clé **global**

```
y = 4  
  
def afficher ():  
    global y  
  
    y = 8  
  
    print(y)  
  
afficher()  
  
print(y)
```



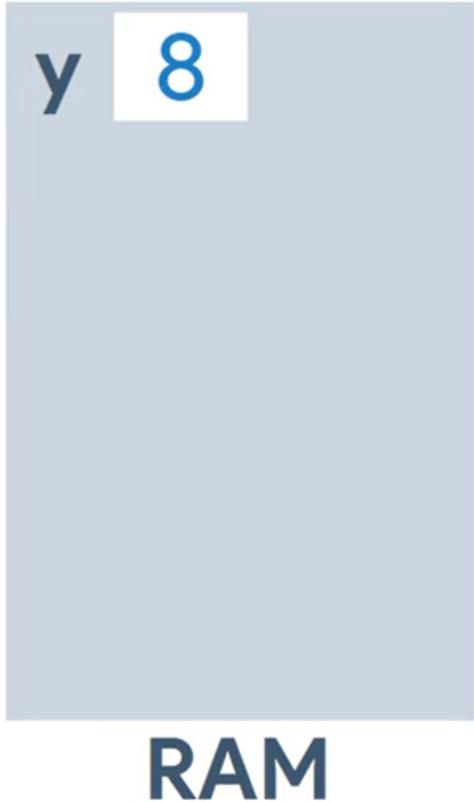
Mot clé **global**

```
y = 4  
def afficher () :  
    global y  
    y = 8  
    print ( y )  
afficher ()  
print ( y )
```



Mot clé **global**

```
y = 4  
  
def afficher ():  
    global y  
  
    y = 8  
  
    print ( y )  
  
afficher ()  
  
→ print ( y )
```



global permet d'indiquer à Python qu'on souhaite bien modifier le contenu de la variable globale y.

Variables locales

Les variables définies à l'intérieur d'une fonction sont appelées **variables locales**. Elles ne peuvent être utilisées que à l'intérieur de la fonction qui les a définies.

Variables globales

Les variables définies en dehors de toute fonction sont appelées **variables globales**. Ces variables sont accessibles en lecture et modification en dehors de toute fonction, par contre elles sont accessibles en **lecture seulement** à l'intérieur des fonctions.

.

Mot clé global

Pour **modifier** la valeur d'une variables globale **depuis une fonction**, il faut utiliser le mot clé **global** devant le nom de la variable afin d'indiquer à Python qu'on souhaite bien **modifier** la valeur de la variable globale.

Exercice

Déterminer la sortie des programmes suivants :

```
def f(x,y):
    global a
    a = 45
    x,y = y,x
    b = 17
    print(a,b,x,y)
a,b,x,y = 3,15,3,4
f(9,81)
print(a,b,x,y)
```

Programme 1

```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
```

Programme 2

```
z = 10
def f():
    global z
    z = 3
def g(x,y):
    global z
    return x + y + z
f()
total = g(4,5)
print(total)
```

Programme 3

```
def f(x, y):  
    global a  
    a = 45  
    x, y = y, x  
    b = 17  
    print(a, b, x, y)  
a, b, x, y = 3, 15, 3, 4  
f(9, 81)  
print(a, b, x, y)  
.
```



Programme 1

```
def f(x, y):  
    global a  
    a = 45  
    x, y = y, x  
    b = 17  
    print(a, b, x, y)  
  
a, b, x, y = 3, 15, 3, 4  
  
f(9, 81)  
  
print(a, b, x, y)  
  
.
```

Programme 1



```
def f( x , y ):  
    global a  
    a = 45  
    x , y = y , x  
    b = 17  
    print( a , b , x , y )  
→ a , b , x , y = 3 , 15 , 3 , 4  
f( 9 , 81 )  
print( a , b , x , y )
```



Programme 1

RAM

```
def f(x, y):  
    global a  
    a = 45  
    x, y = y, x  
    b = 17  
    print(a, b, x, y)  
a, b, x, y = 3, 15, 3, 4  
f(9, 81)  
print(a, b, x, y)
```

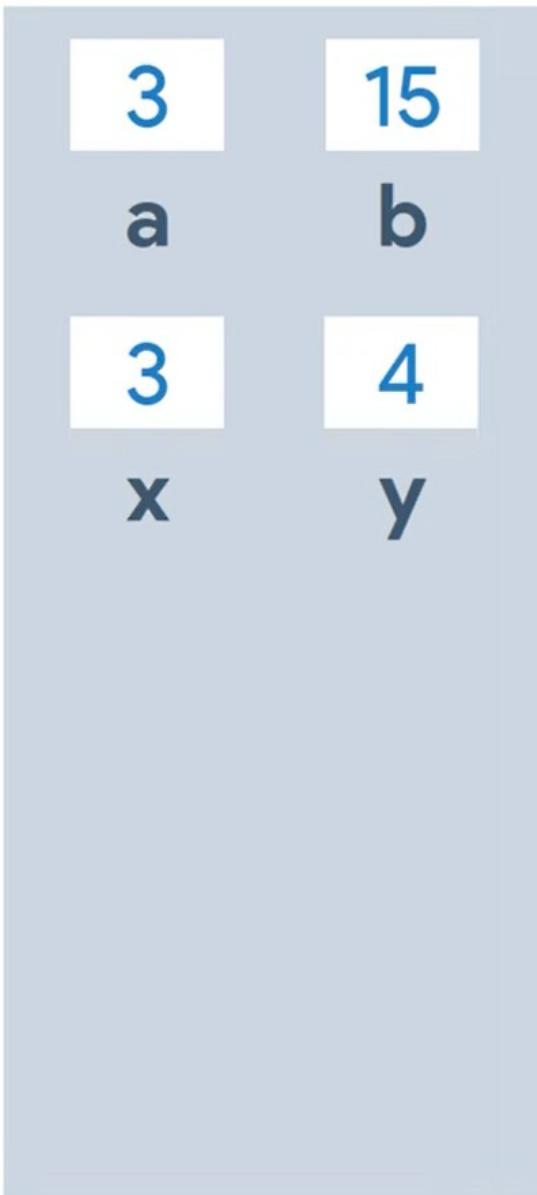


Programme 1

RAM

```
def f( x , y ):  
    global a  
  
    a = 45  
  
    x , y = y , x  
  
    b = 17  
  
    print( a , b , x , y )  
  
a , b , x , y = 3 , 15 , 3 , 4  
  
f( 9 , 81 )  
  
print( a , b , x , y )
```

Programme 1



RAM



```
def f(x, y):  
    global a  
    a = 45  
    x, y = y, x  
    b = 17  
    print(a, b, x, y)  
a, b, x, y = 3, 15, 3, 4  
f(9, 81)  
print(a, b, x, y)
```

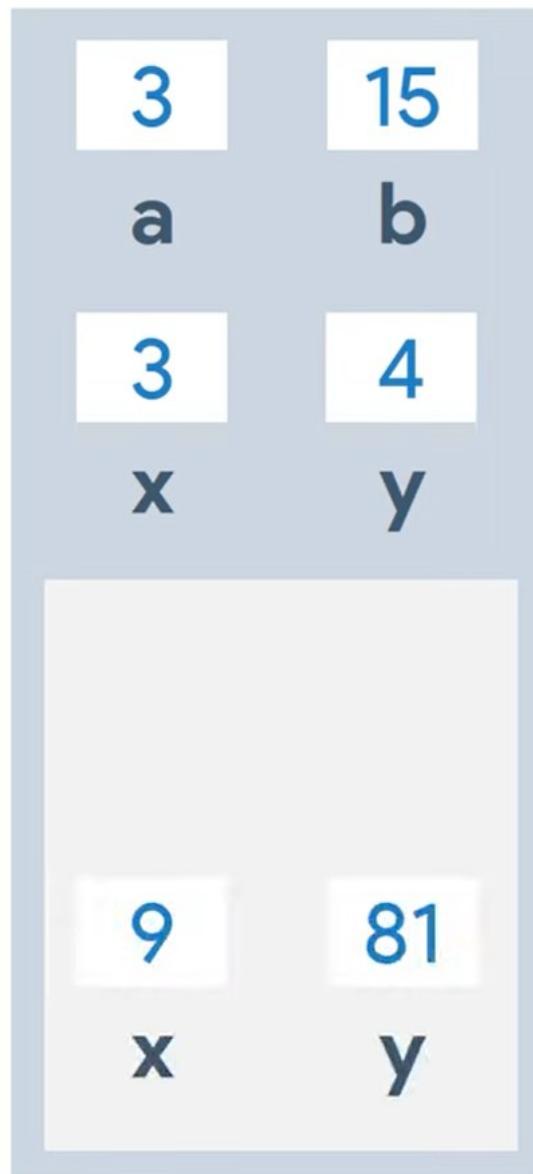


Programme 1

RAM



```
def f(x, y):  
    global a  
    a = 45  
    x, y = y, x  
    b = 17  
    print(a, b, x, y)  
a, b, x, y = 3, 15, 3, 4  
f(9, 81)  
print(a, b, x, y)
```

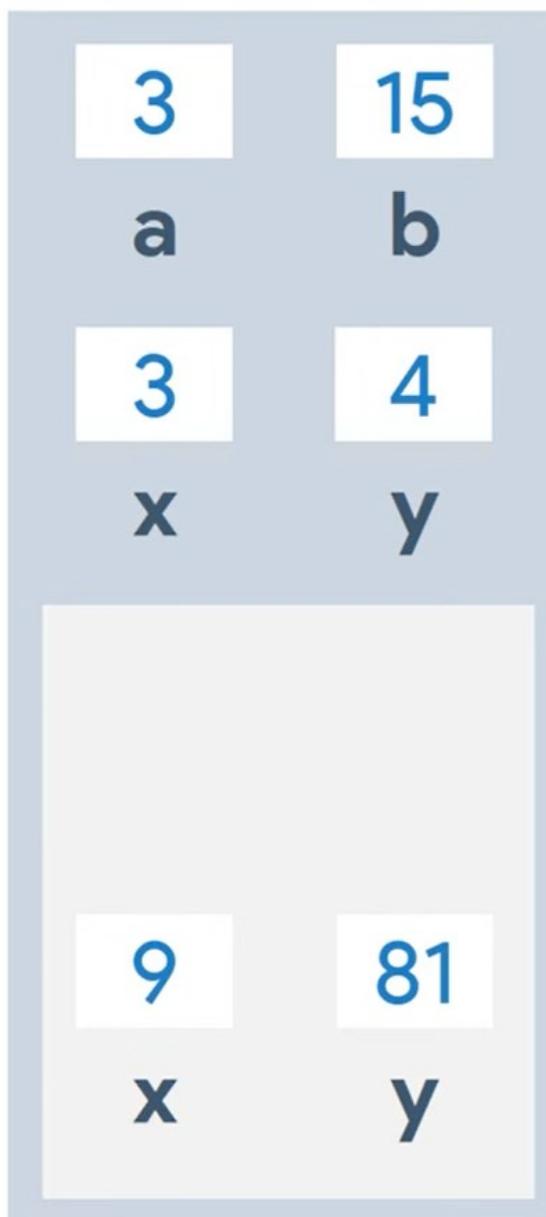


Programme 1

RAM



```
ef f( x , y ):  
    global a  
  
    a = 45  
  
    x , y = y , x  
  
    b = 17  
  
    print( a , b , x , y )  
  
, b , x , y = 3 , 15 , 3 , 4  
  
( 9 , 81 )  
  
rint( a , b , x , y )
```

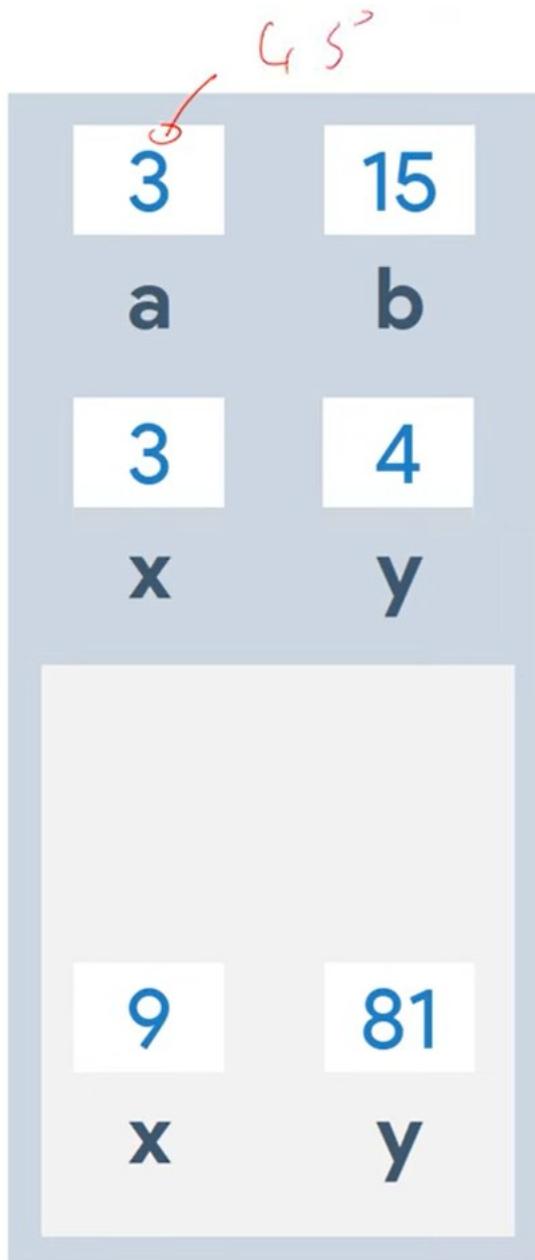


RAM



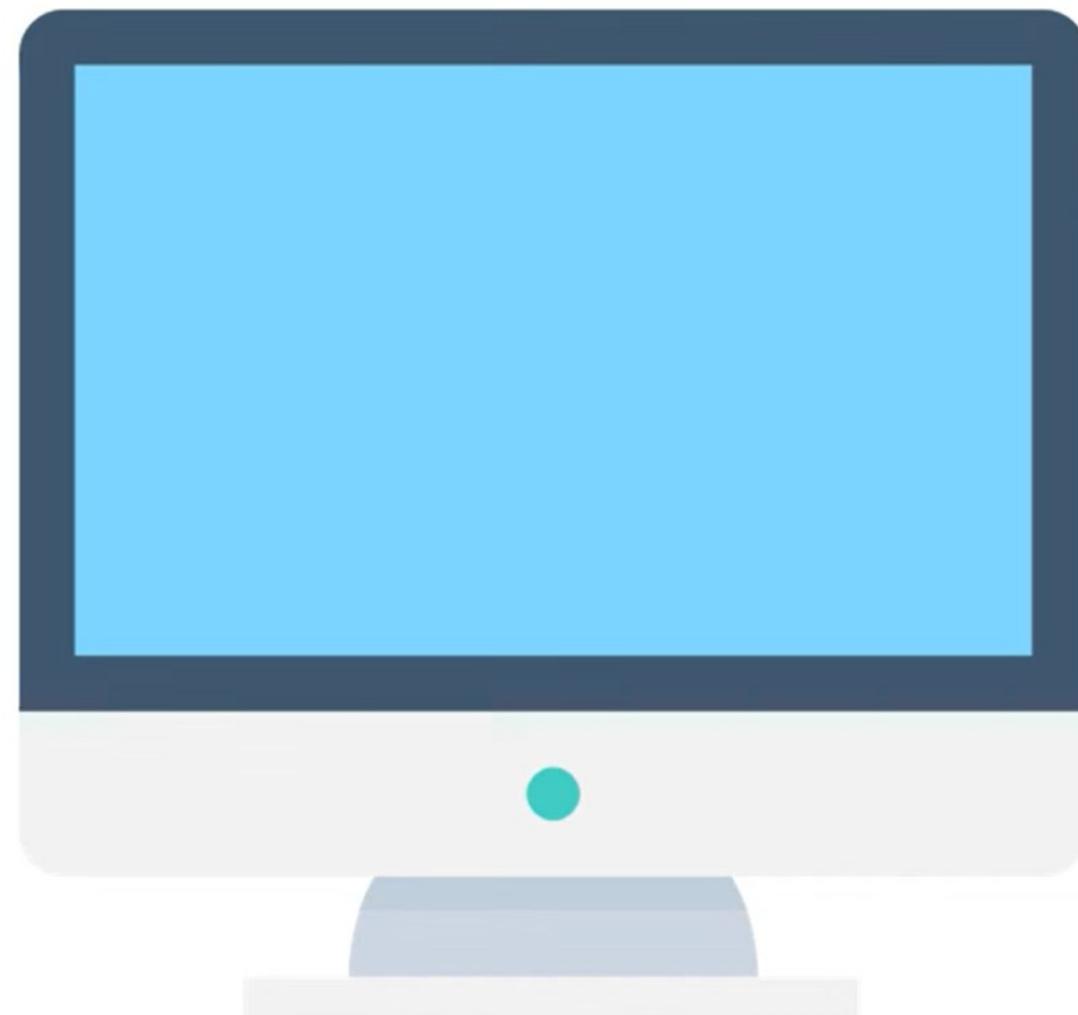
Programme 1

```
def f(x, y):  
    global a  
    a = 45  
    x, y = y, x  
    b = 17  
    print(a, b, x, y)  
a, b, x, y = 3, 15, 3, 4  
f(9, 81)  
print(a, b, x, y)
```

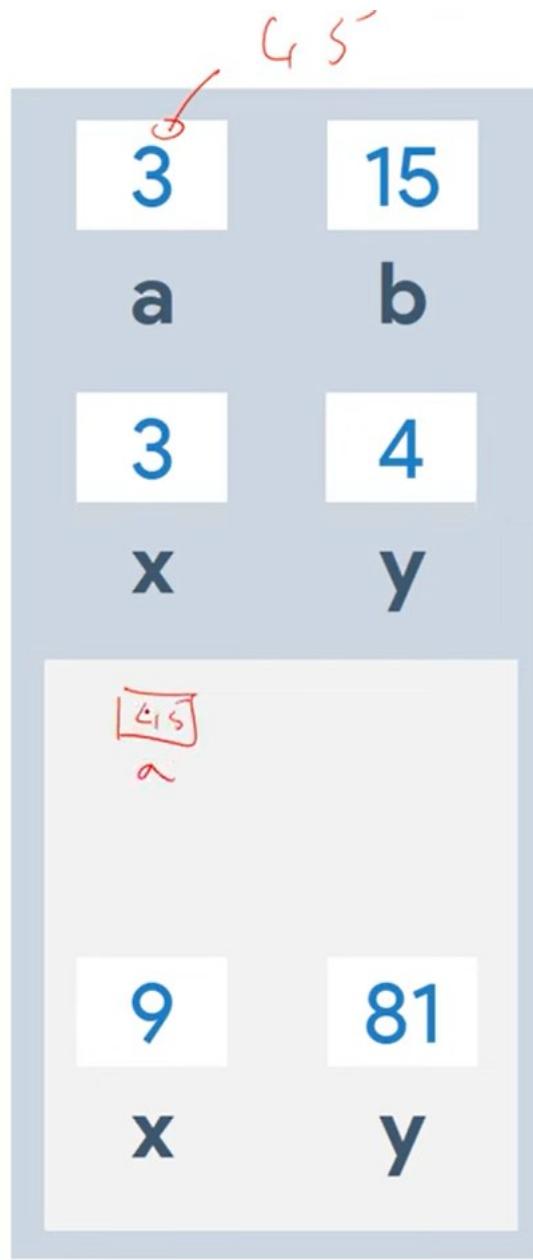


Programme 1

RAM



```
def f(x, y):  
    global a  
    a = 45  
  
    x, y = y, x  
  
    b = 17  
  
    print(a, b, x, y)  
  
a, b, x, y = 3, 15, 3, 4  
  
f(9, 81)  
  
print(a, b, x, y)
```

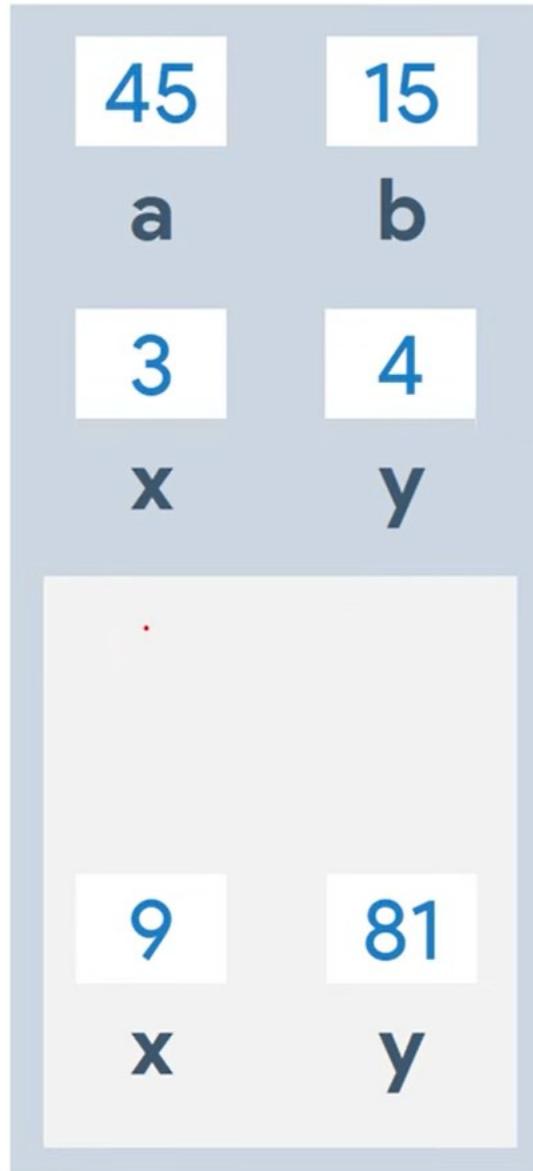


Programme 1

RAM



```
def f(x, y):  
    global a  
    a = 45  
    x, y = y, x  
    b = 17  
    print(a, b, x, y)  
a, b, x, y = 3, 15, 3, 4  
f(9, 81)  
print(a, b, x, y)
```

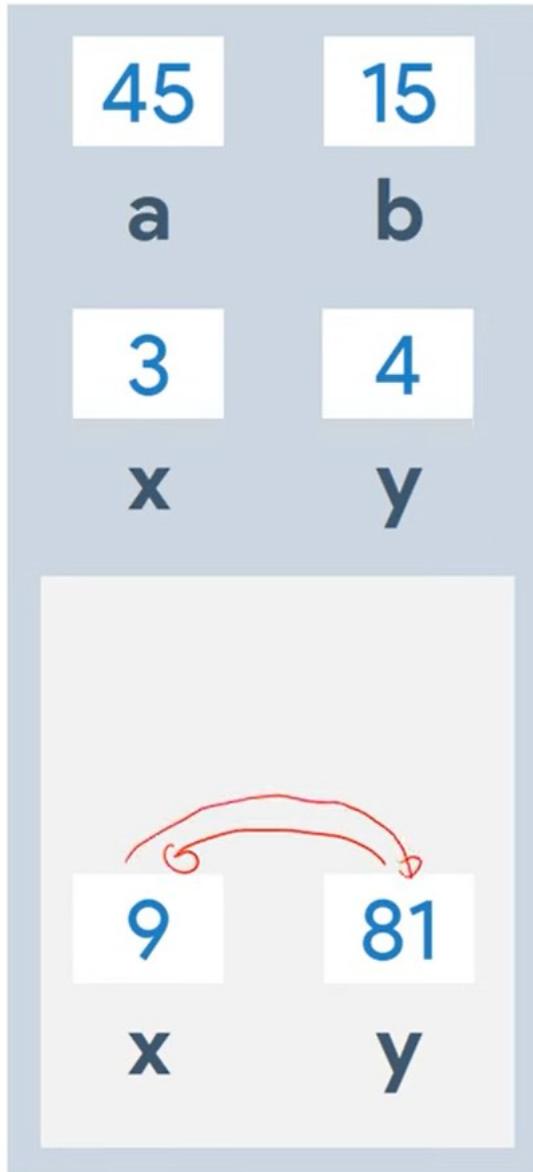


Programme 1

RAM



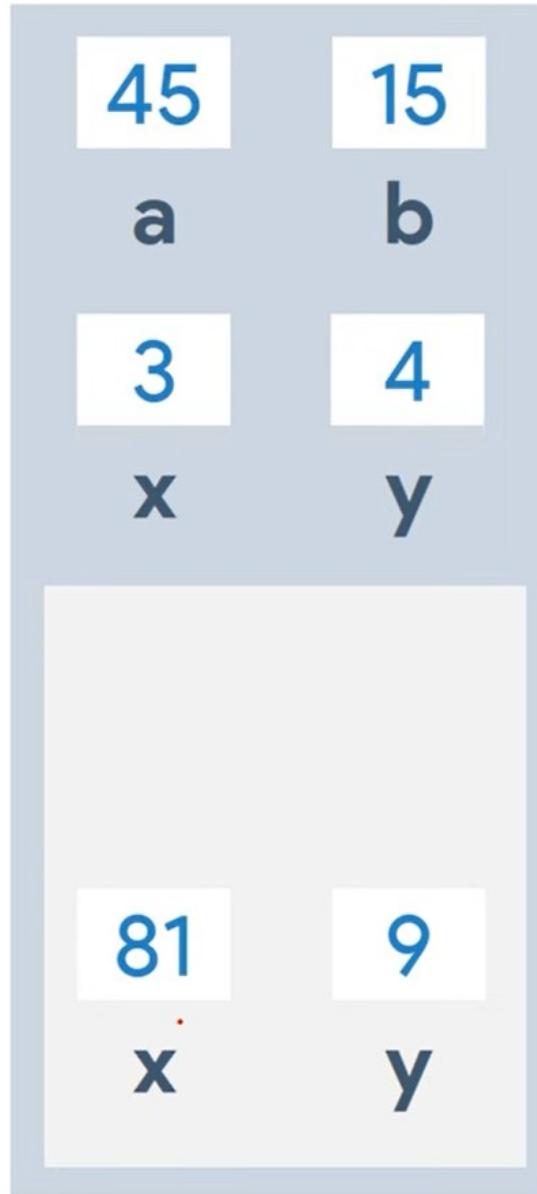
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    x, y = y, x  
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```



Programme 1

RAM

```
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    x, y = y, x  
  
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    print(a, b, x, y)  
  
a, b, x, y = 3, 15, 3, 4  
  
f(9, 81)  
  
print(a, b, x, y)
```

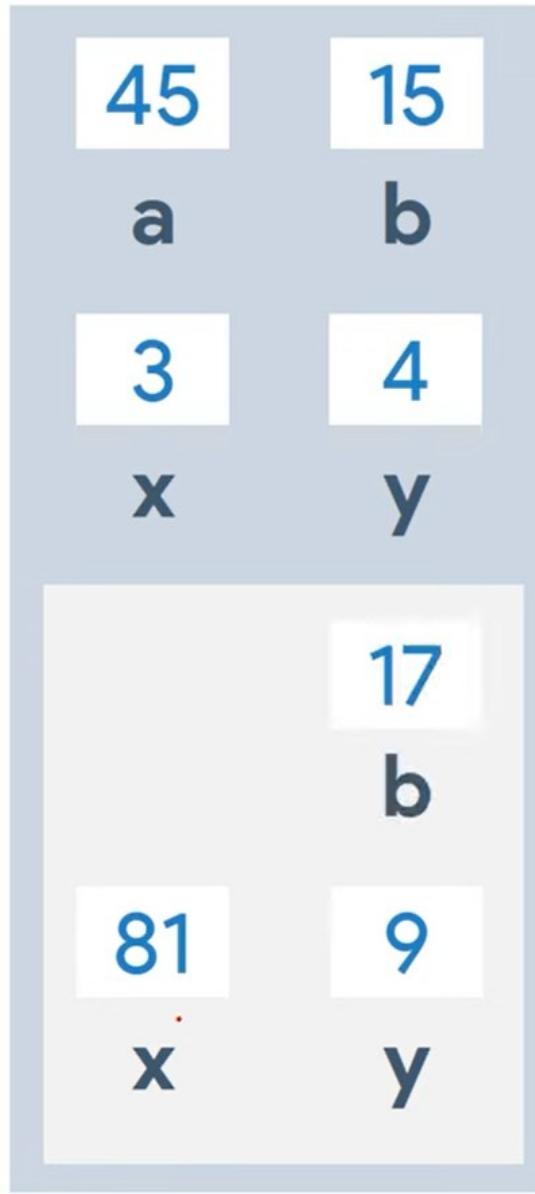


Programme 1

RAM

```
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    global a  
    a = 45  
    x , y = y , x  
    b = 17  
    print( a , b , x , y )  
a , b , x , y = 3 , 15 , 3 , 4  
f( 9 , 81 )  
print( a , b , x , y )
```

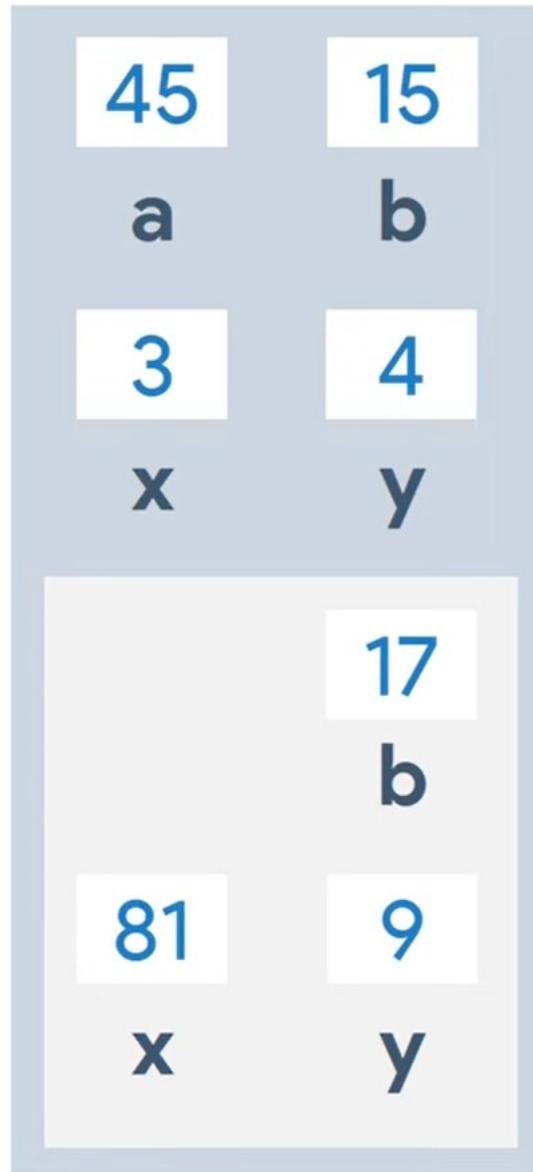
Programme 1



RAM



```
def f(x, y):  
    global a  
    a = 45  
    x, y = y, x  
    b = 17  
    print(a, b, x, y)  
  
a, b, x, y = 3, 15, 3, 4  
f(9, 81)  
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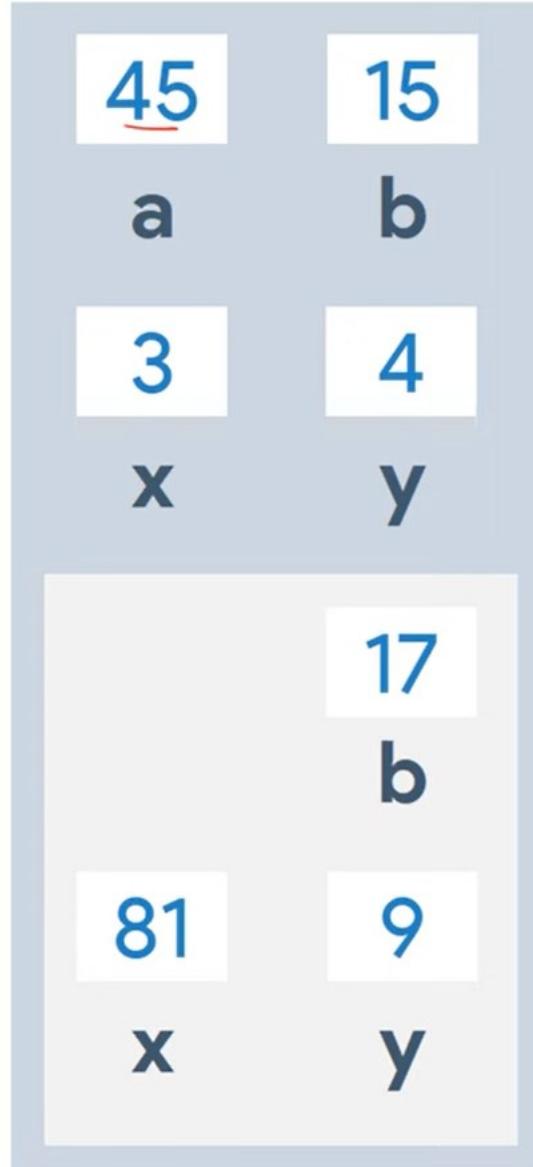


Programme 1

RAM

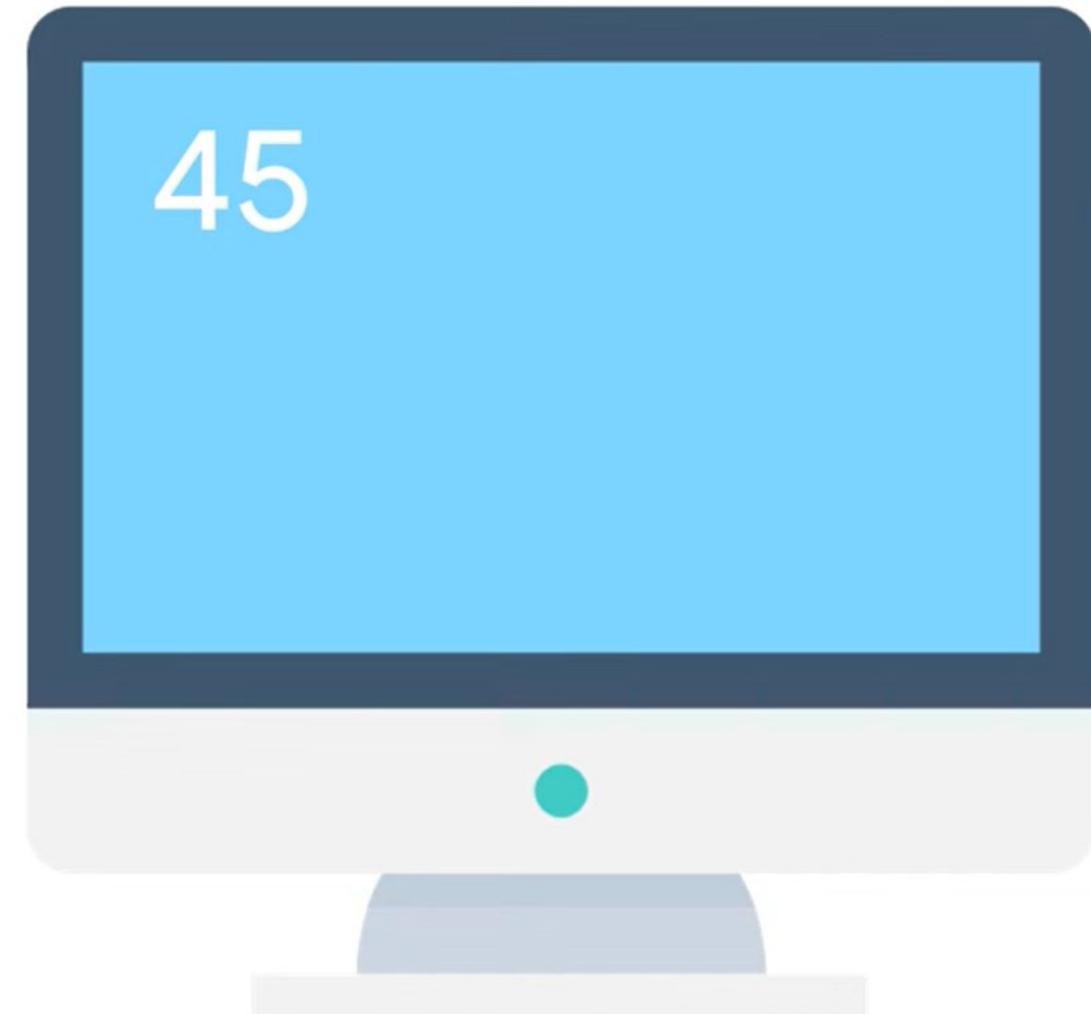


```
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    global a  
    a = 45  
    x, y = y, x  
    b = 17  
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f(9, 81)  
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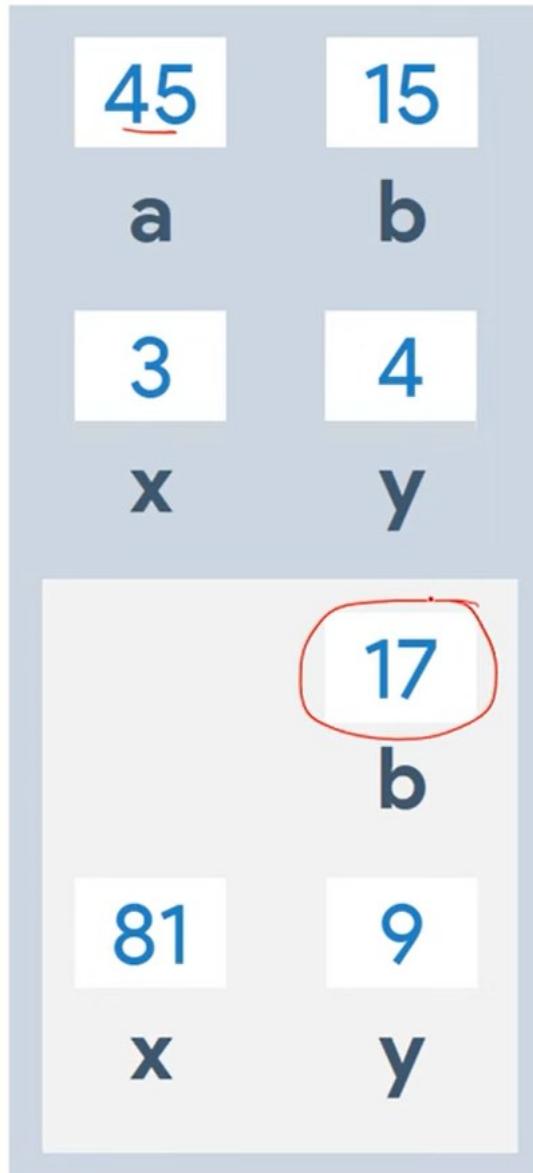


Programme 1

RAM

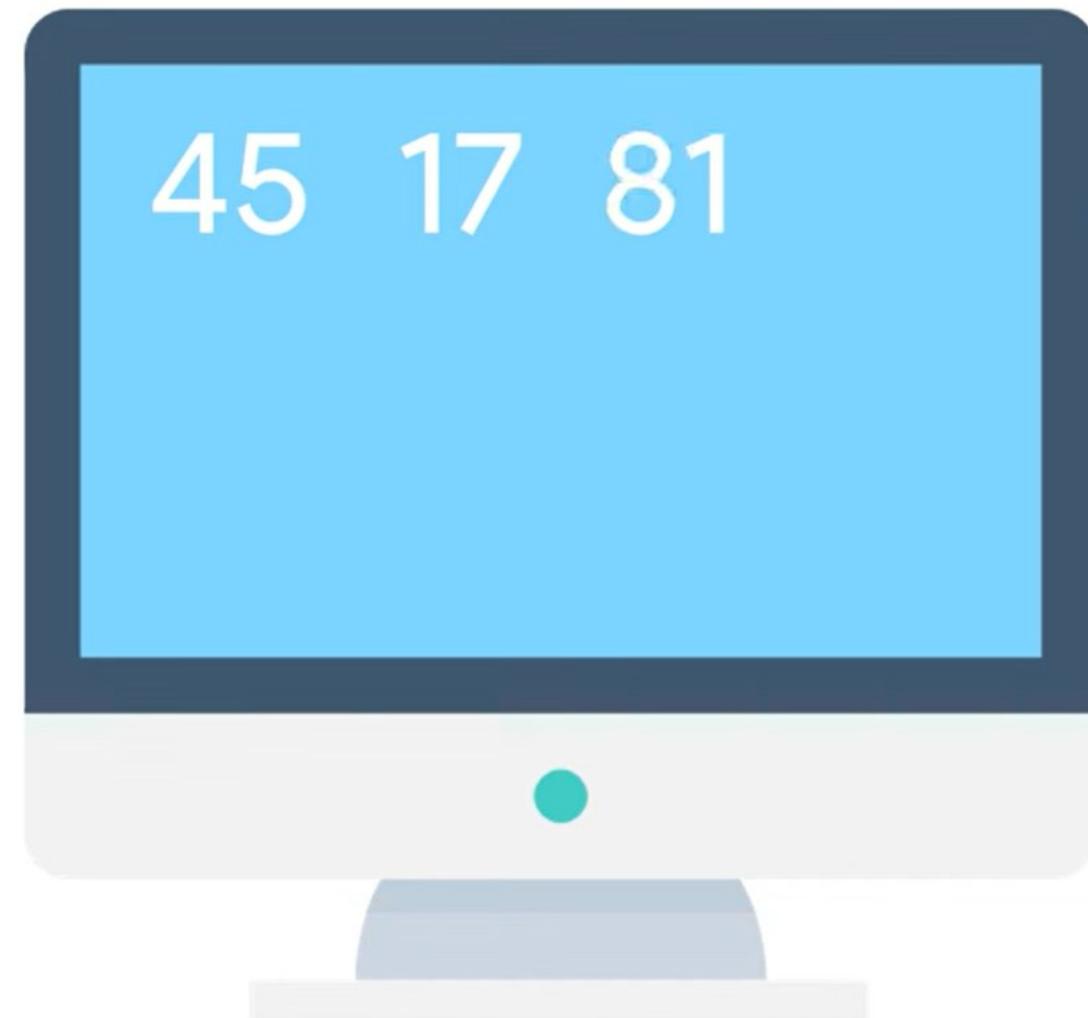


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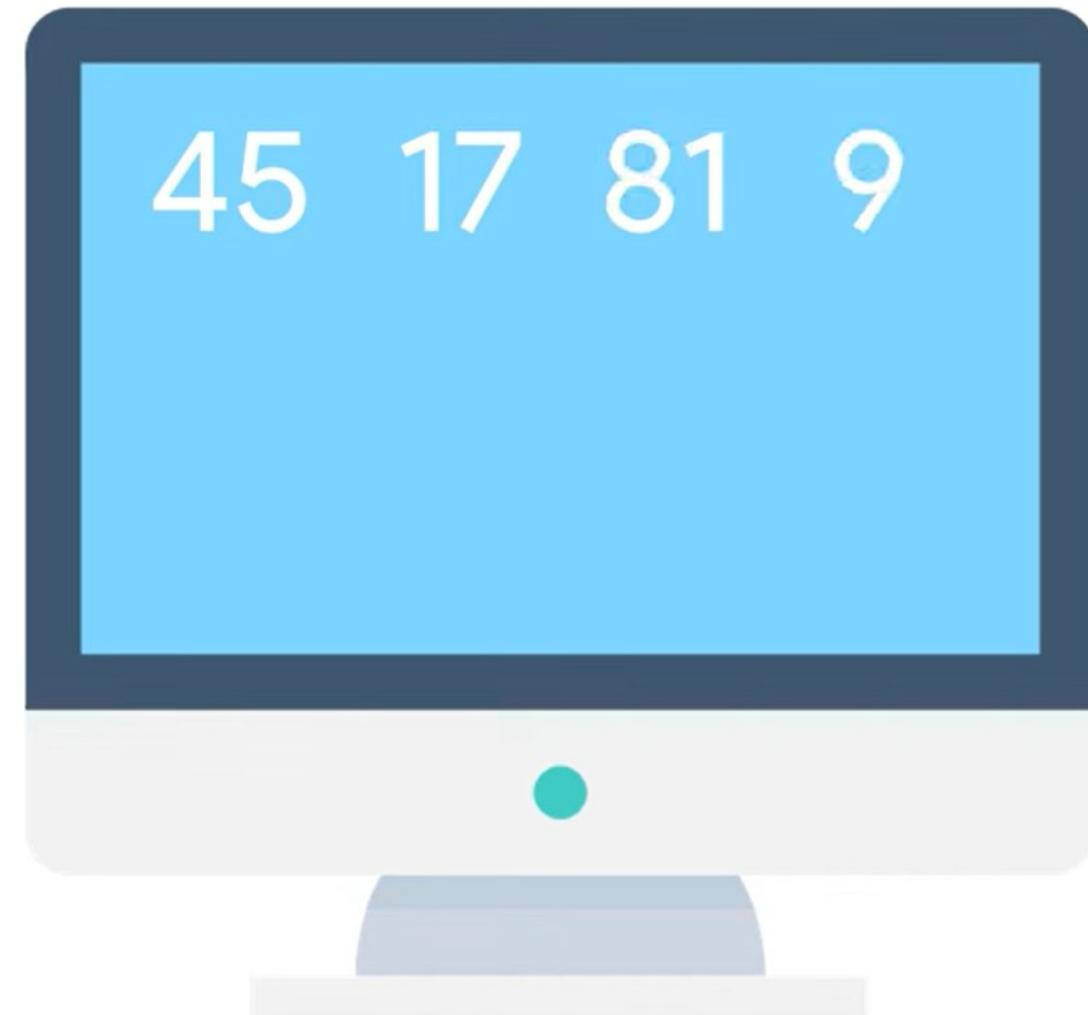
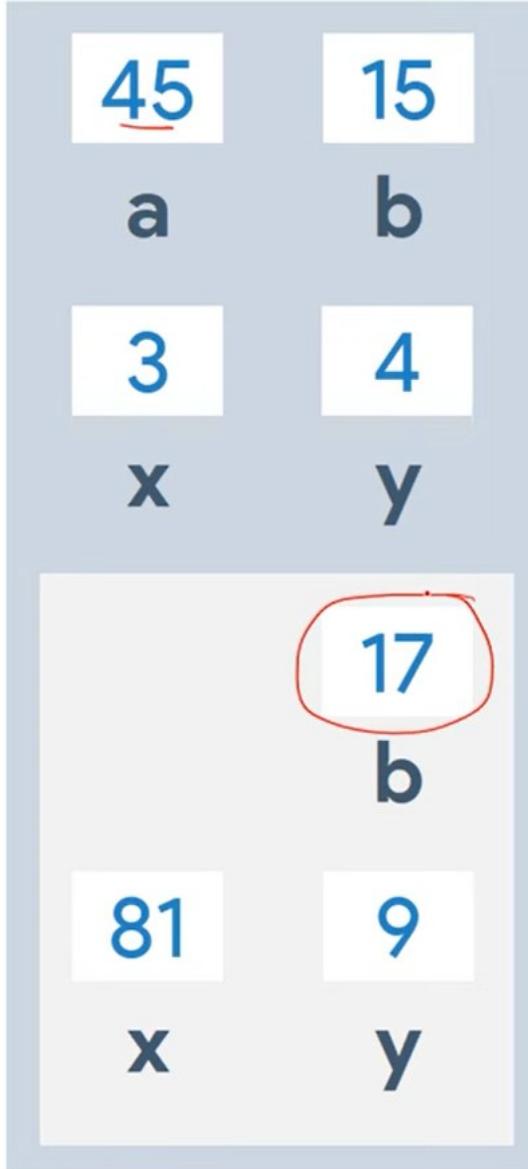


Programme 1

RAM



```
def f(x, y):  
    global a  
    a = 45  
    x, y = y, x  
    b = 17  
    print(a, b, x, y)  
  
a, b, x, y = 3, 15, 3, 4  
f(9, 81)  
print(a, b, x, y)
```

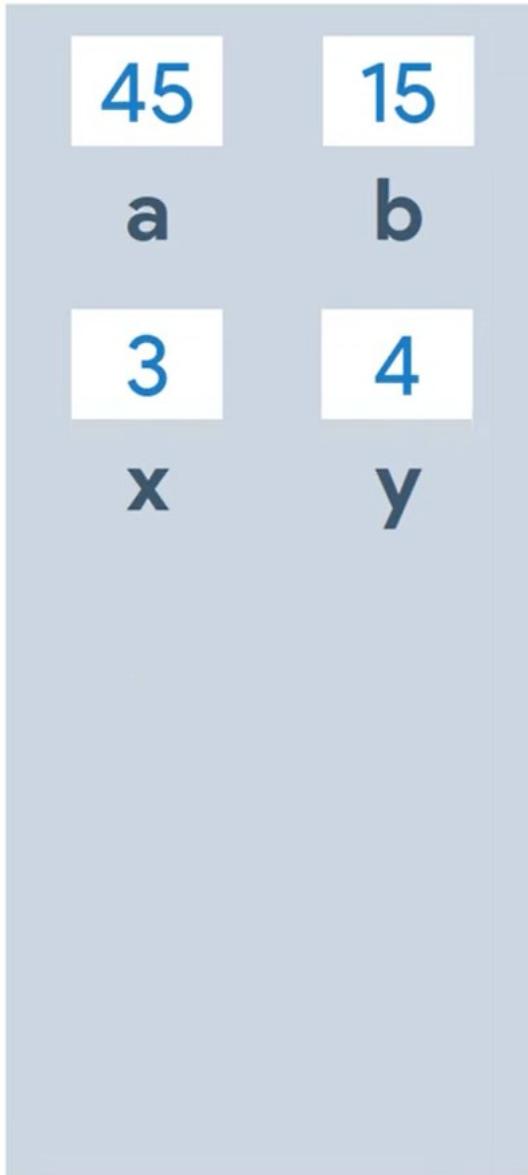


Programme 1

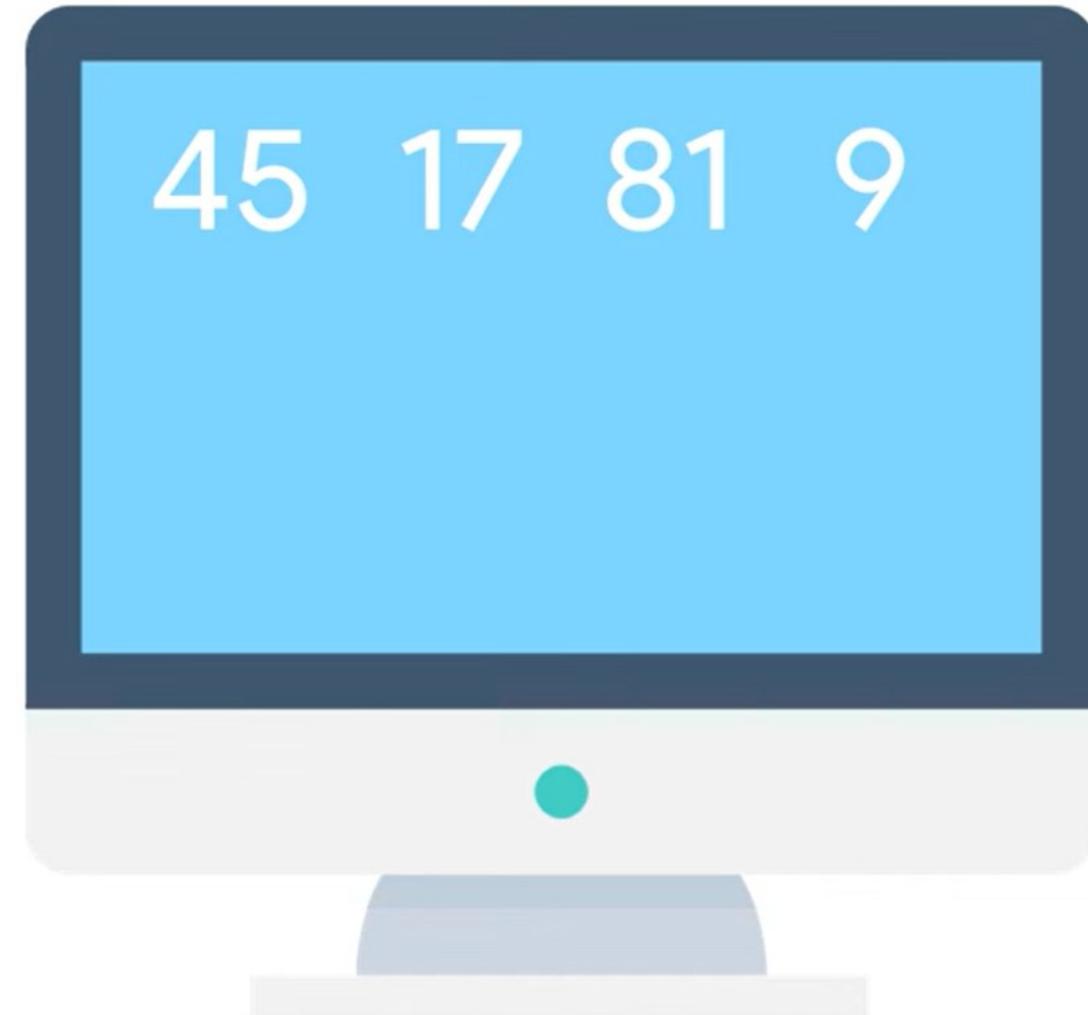
RAM

```
def f(x,y):  
    global a  
    a = 45  
    x, y = y, x  
    b = 17  
    print(a,b,x,y)  
a,b,x,y = 3,15,3,4  
f(9,81)  
print(a,b,x,y)
```

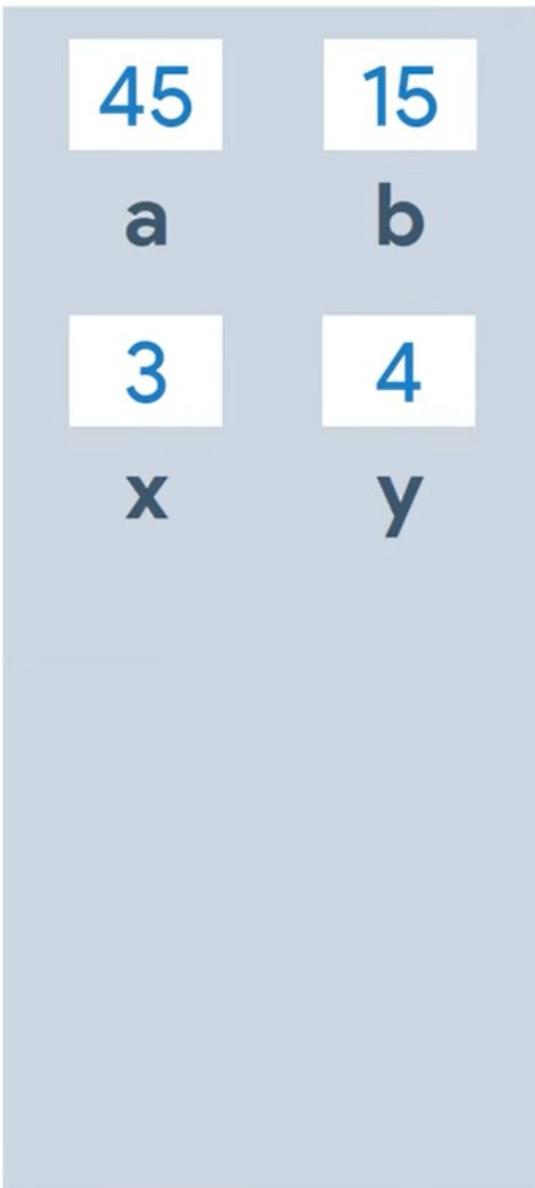
Programme 1



RAM



```
def f(x, y):  
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    a = 45  
    x, y = y, x  
    b = 17  
    print(a, b, x, y)  
  
a, b, x, y = 3, 15, 3, 4  
f(9, 81)  
print(a, b, x, y)  
.
```



Programme 1

RAM



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
.
print(a)
```

?

```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
.
print(a)
```

?

```
a = 1  
def f():  
    print(a)  
def g():  
    a = 2  
    print(a)  
def h():  
    global a  
    a = 3  
    print(a)  
print(a)  
f()  
print(a)  
g()  
print(a)  
h()  
.  
print(a)
```

Programme 2

1
a

RAM

?



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2

1

a

RAM



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2

1

a

RAM

1



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2

1
a

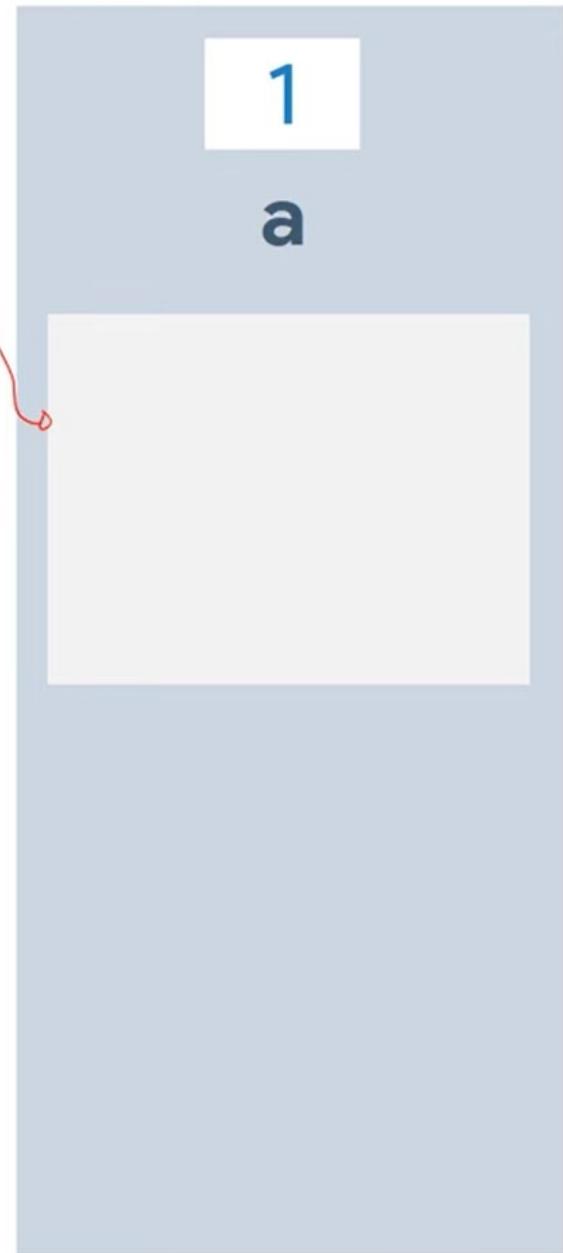
RAM

1



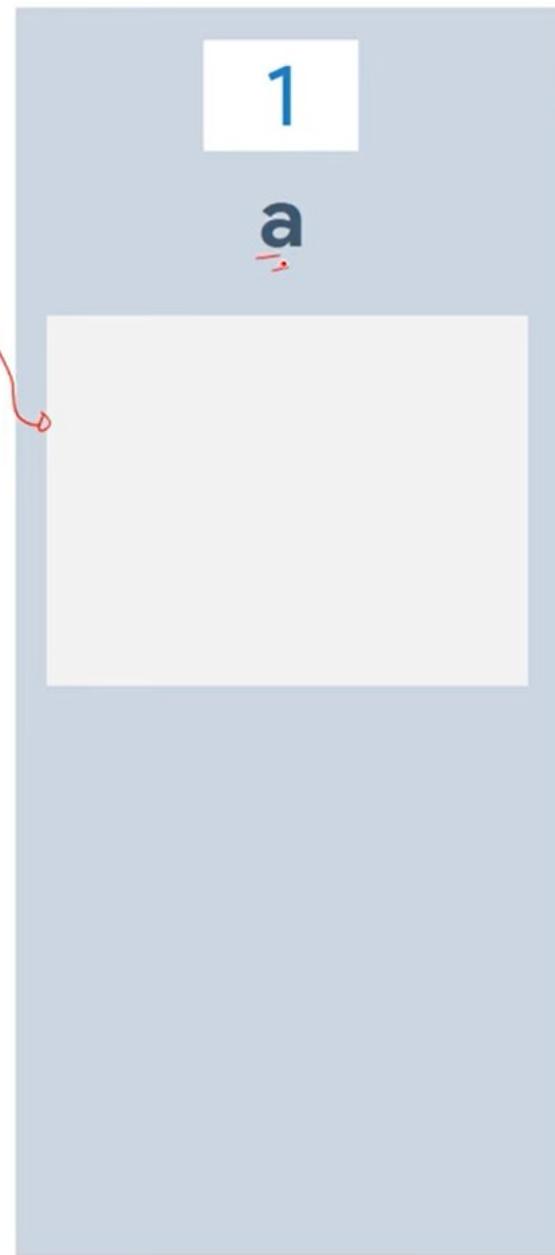
```
a = 1  
def f():  
    print(a)  
def g():  
    a = 2  
    print(a)  
def h():  
    global a  
    a = 3  
    print(a)  
print(a)  
f()  
print(a)  
g()  
print(a)  
h()  
print(a)
```

Programme 2



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

1

a

1
1

1

Programme 2

RAM

```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2

1

a

RAM

1
1
1



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2

1

a

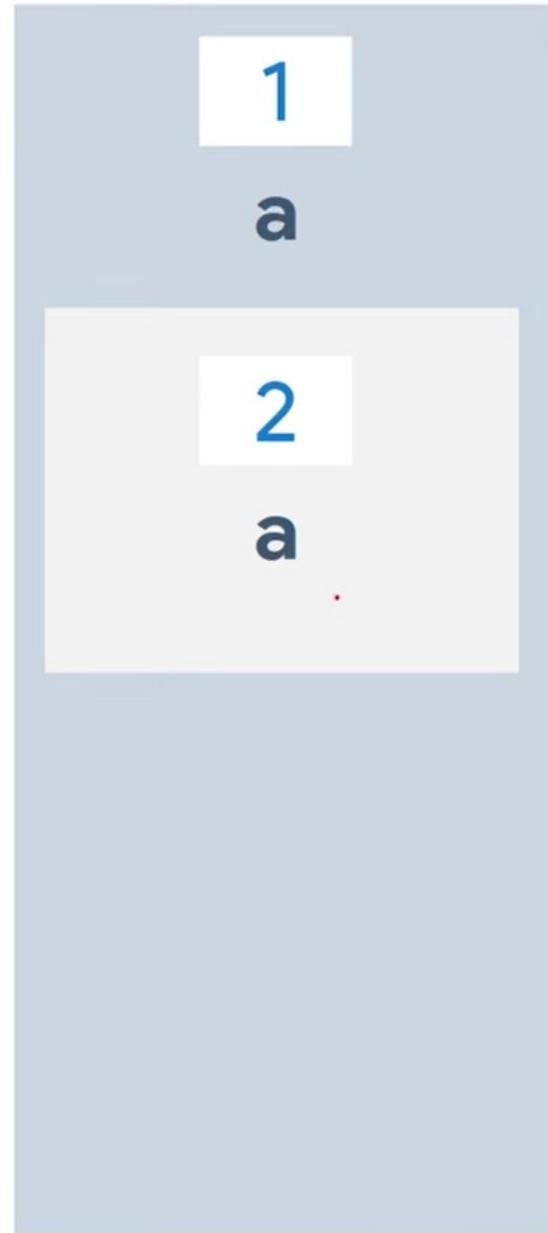
RAM

1
1
1



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2

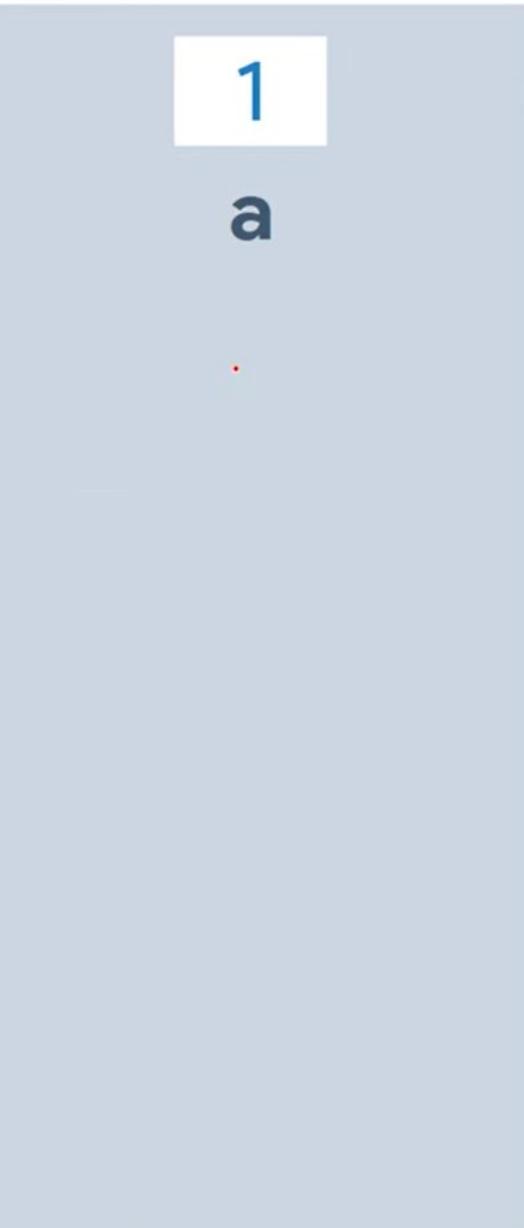


RAM



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2

1

a

.

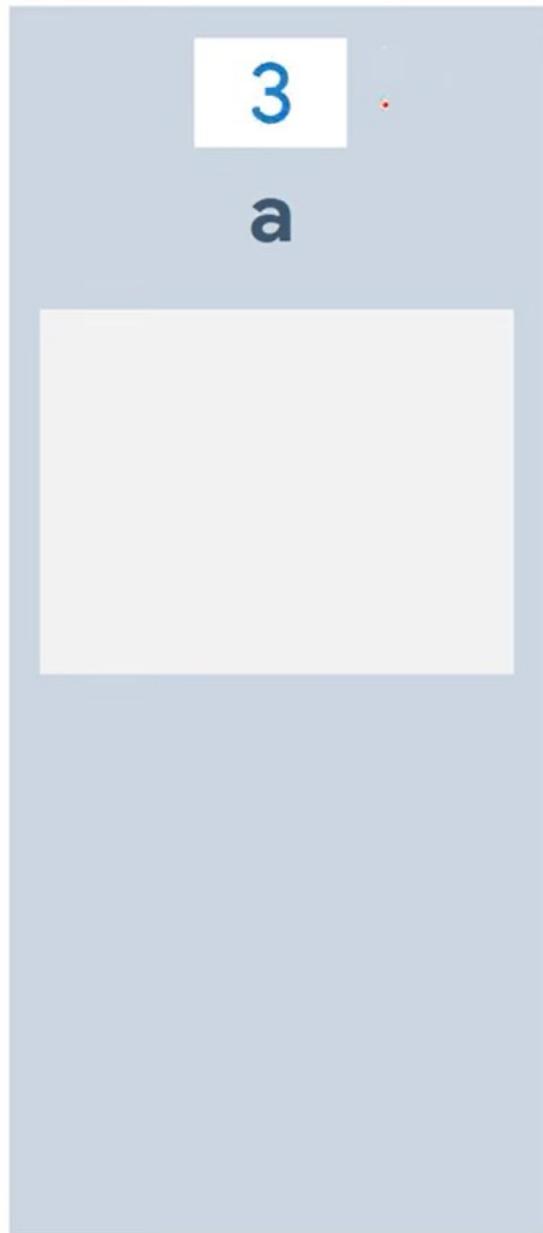
RAM

1
1
1
2
1



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2



RAM



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2

RAM

3

a

1
1
1
2
1
3



```
a = 1
def f():
    print(a)
def g():
    a = 2
    print(a)
def h():
    global a
    a = 3
    print(a)
print(a)
f()
print(a)
g()
print(a)
h()
print(a)
```

Programme 2

3

a

RAM

1
1
1
2
1
3
3



```
z = 10  
  
def f():  
    global z  
  
    z = 3  
  
def g(x,y):  
    global z  
  
    return x + y + z  
  
f()  
  
total = g(4,5)  
  
print(total)
```



Programme 3

→ z = 10

def f():

global z

z = 3

def g(x,y):

global z

return x + y + z

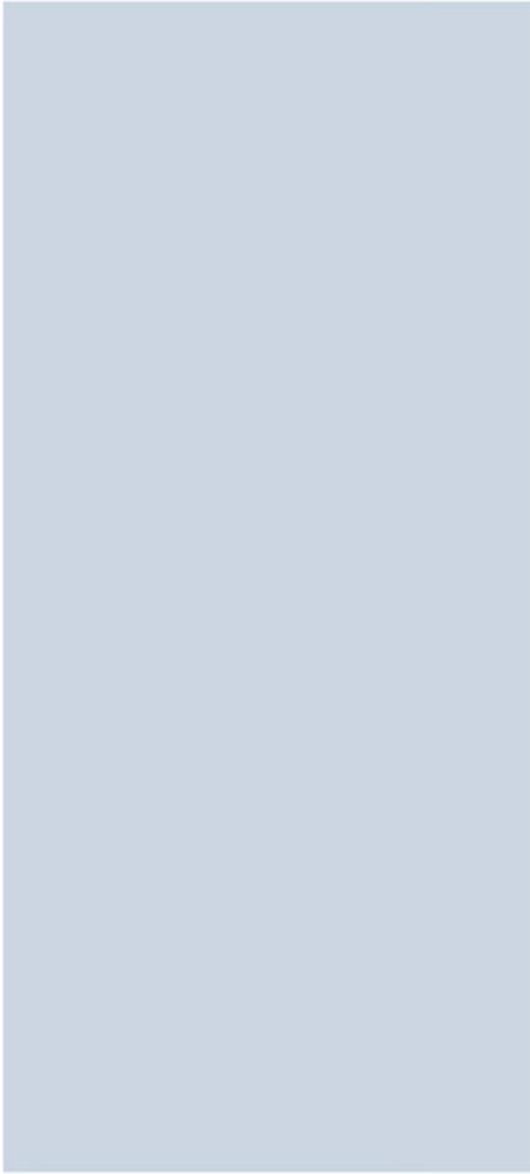
f()

total = g(4,5)

print(total)

Programme 3

RAM



```
z = 10
```

```
def f():
```

```
    global z
```

```
    z = 3
```

```
def g(x,y):
```

```
    global z
```

```
    return x + y + z
```

```
f()
```

```
total = g(4,5)
```

```
print(total)
```

Programme 3

```
10
```

```
z
```

RAM



```
z = 10
```

```
def f():
```

```
    global z
```

```
    z = 3
```

```
def g(x,y):
```

```
    global z
```

```
    return x + y + z
```

```
f()
```

```
total = g(4,5)
```

```
print(total)
```

10

z

Programme 3

RAM



```
z = 10
```

```
def f():
```

```
    global z
```

```
    z = 3
```

```
def g(x,y):
```

```
    global z
```

```
    return x + y + z
```

```
f()
```

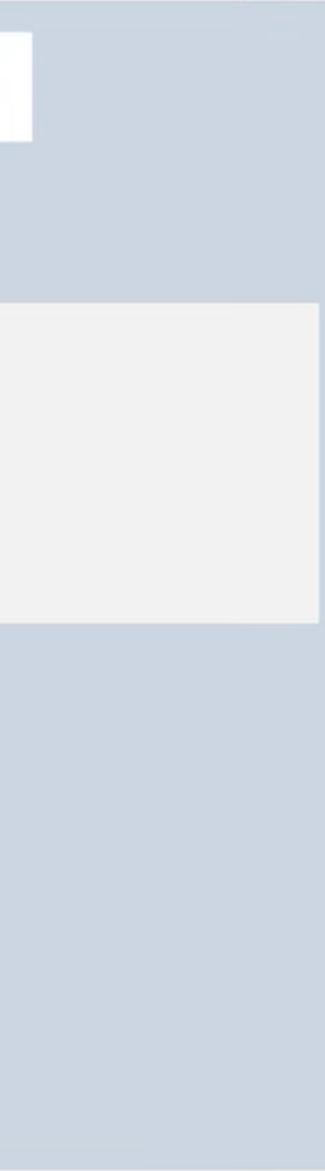
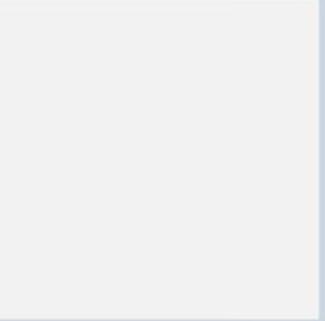
```
total = g(4,5)
```

```
print(total)
```

Programme 3

```
3
```

```
z
```

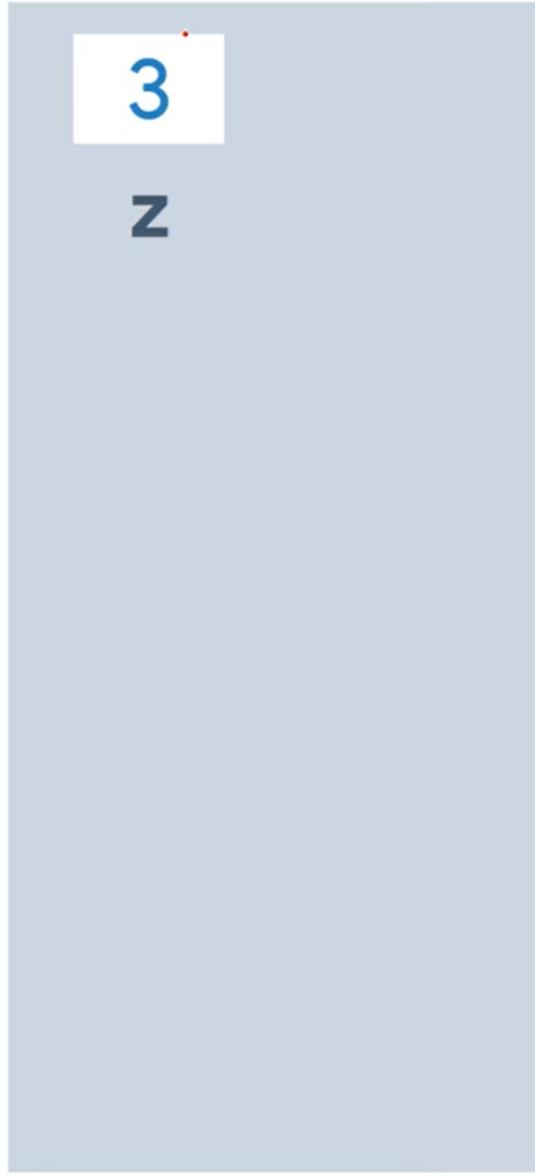


RAM



```
z = 10  
  
def f():  
  
    global z  
  
    z = 3  
  
def g(x,y):  
  
    global z  
  
    return x + y + z  
  
f()  
  
total = g(4,5)  
  
print(total)
```

Programme 3



RAM



z = 10

def f():

global z

z = 3

def g(x,y):

global z

return x + y + z

f()

total = g(4,5)

print(total)

Programme 3

3

z

4

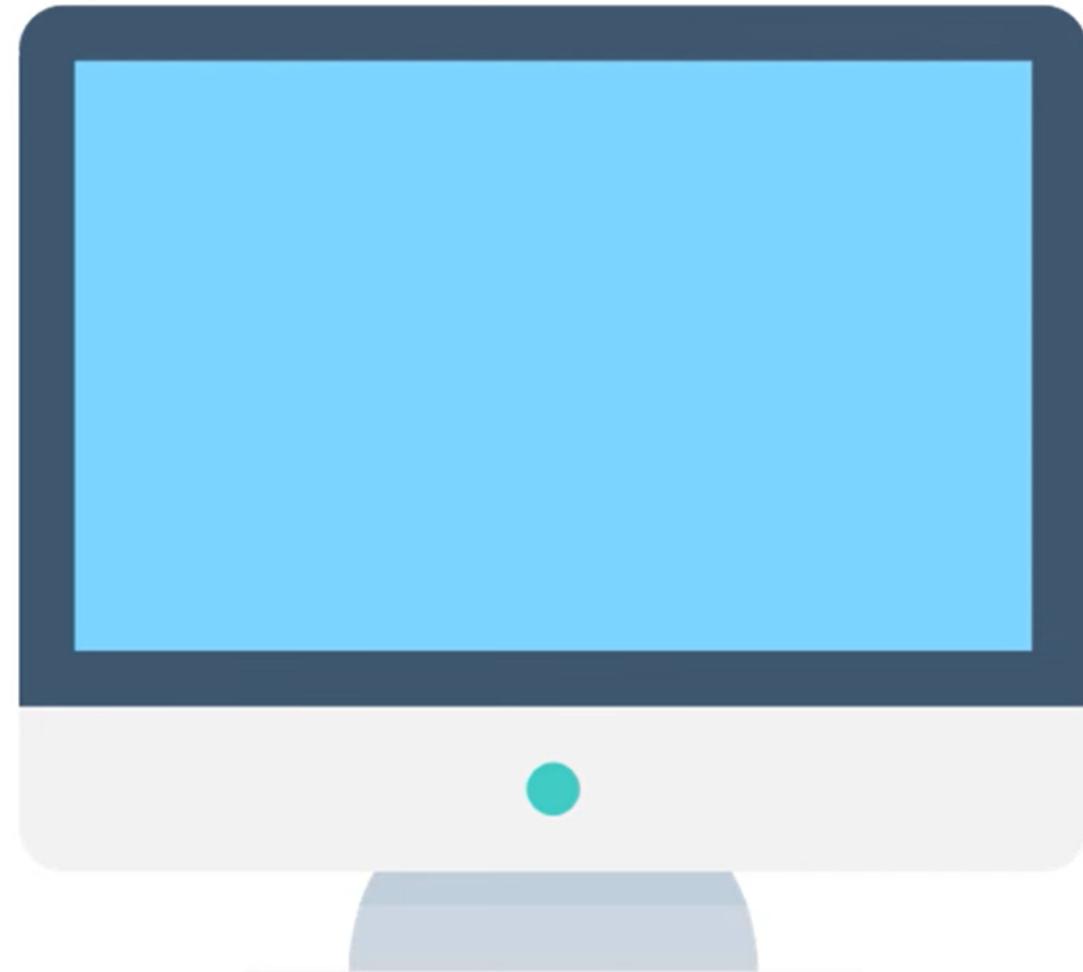
5

x

y

RAM

RAM



z = 10

def f():

global z

z = 3

def g(x,y):

global z

return x + y + z

f()

total = g(4,5)

print(total)

3

z

12

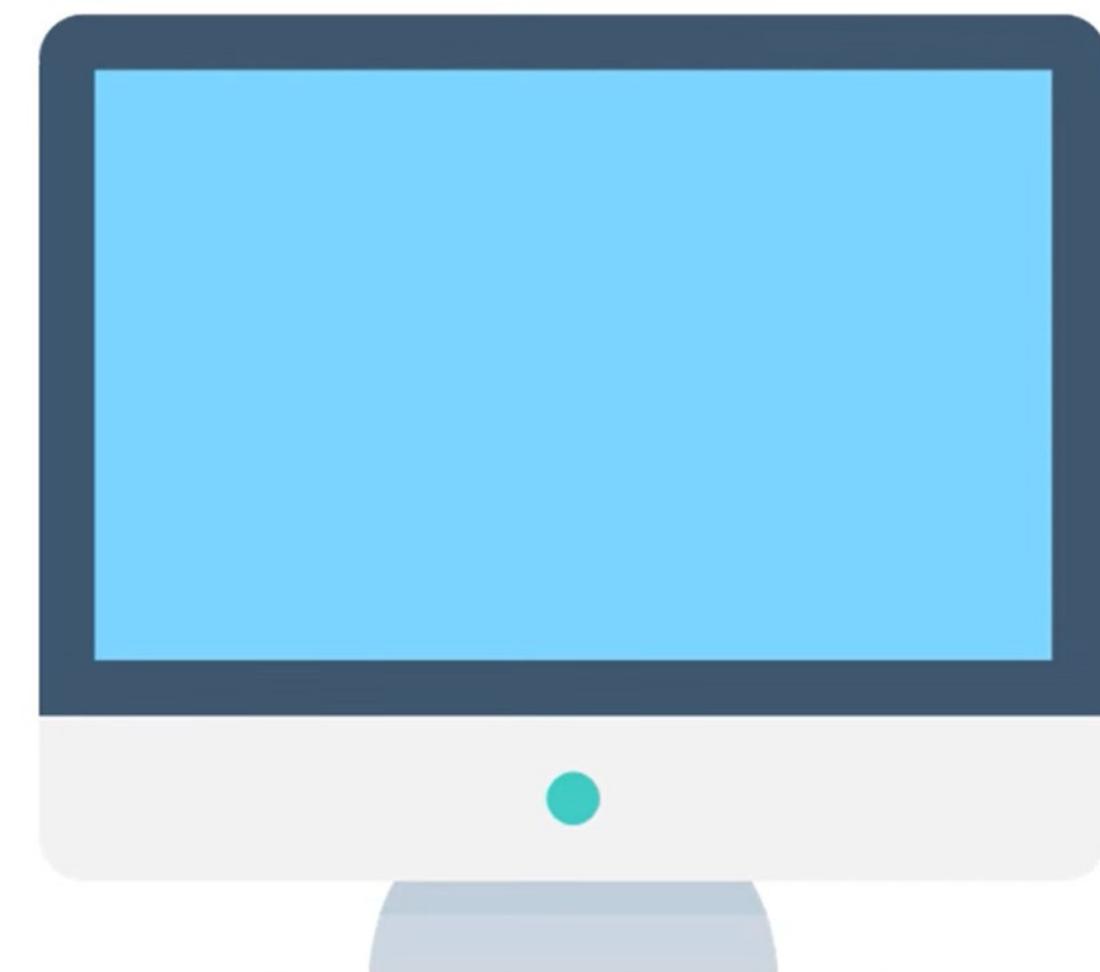
total

4

x

5

y

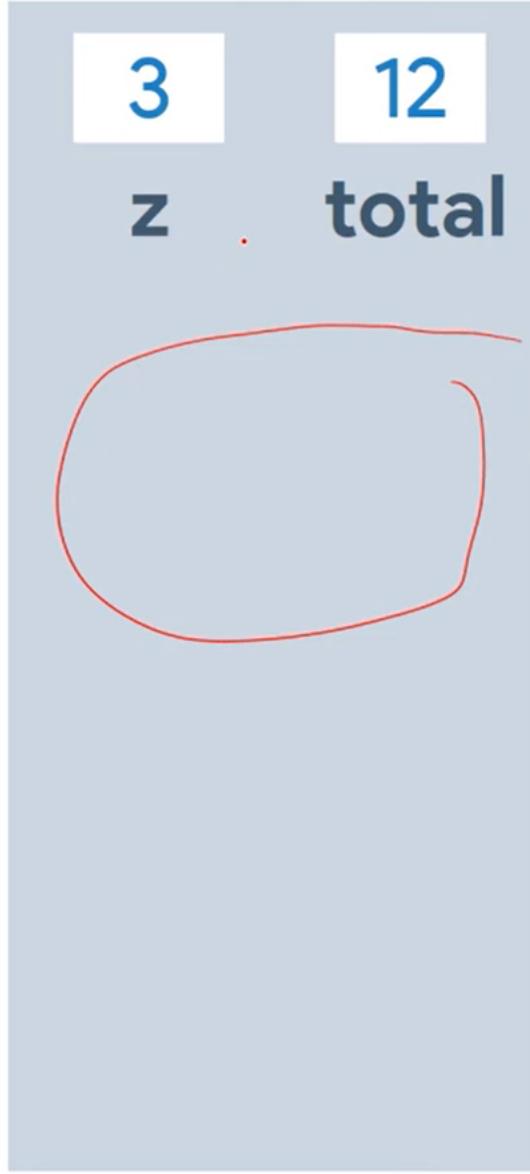


Programme 3

RAM

```
z = 10  
  
def f():  
    global z  
  
    z = 3  
  
def g(x,y):  
    global z  
  
    return x + y + z  
  
f()  
  
total = g(4,5)  
  
print(total)
```

Programme 3



RAM

