Expression Evaluation

Increment operator

- Increment - Increase Value by 1
- Increment Operator **- ++**
- **Increment operator**
- Post Increment - (**a++**) **=** a=a+1
- Pre Increment - (**++a**) = a= a+1

Decrement operator

- Decrement decrease value by 1 /Increase Value by 1
- Decrement operator - **- -**
- **Decrement operator**
- Post decrement - (**a--**) **=** a=a-1
- Pre decrement - (**--a**) = a= a-1

Example

- Int a=5;
- a - -;
- Printf(“%d” ,a);
- Answer: 4
- Printf(“%d” ,a - -);
- Printf(“%d” ,a);
- Answer: 5 4

- Int a=5;
- - - a;
- Printf(“%d” ,a);
- Answer: 4
- Printf(“%d” , - - a);
- Printf(“%d” ,a);
- Answer: 4   4

Example

- **Int x =5**
- **Int y;**
- **y = (- - x);**
- Printf(“%d” ,x);
- Printf(“%d” ,y);
- Answer: 4   4

- **Int x =5**
- **Int y;**
- **y = (x - -); //y=x x=x-1**
- Printf(“%d” ,x);
- Printf(“%d” ,y);
- Answer: 4   5

Example

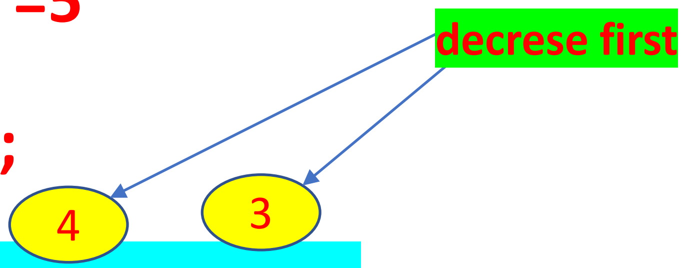
- **Int x =5**
- **Int y;**
- **y = x - - + x - - ;**
- Printf(“%d” ,x);
- Printf(“%d” ,y);
- Answer: 9 3

y = x - - + x - - ;

1. (x - -) = 5 x = 4
2. (x - -) = 4 x = 3

Example

- **Int x =5**
- **Int y;**



- **y = - - x + - - x ;**
- Printf(“%d” ,x);
- Printf(“%d” ,y);
- Answer: 6 3

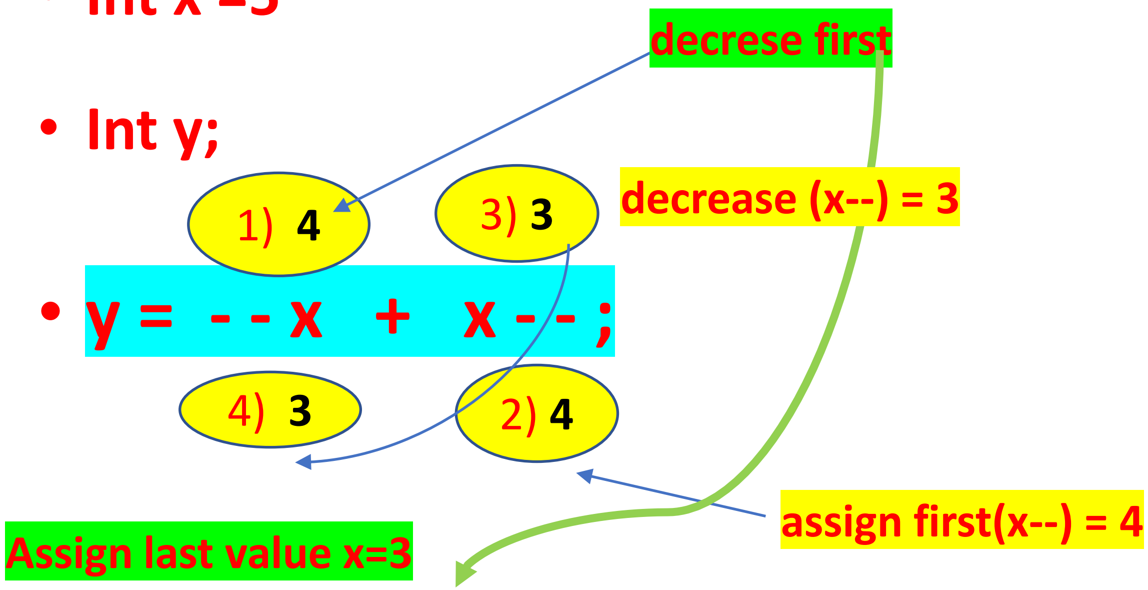
- **y = - - x + - - x ;**
- **//decrese first + assigned at last**

1. (- - x) = 4 //**decrease first**
2. (- - x) = 3 //**decrease first**
3. 3 + 3 //**assigned at last**

//x=3 assigned last

Example

- **Int x =5**
- **Int y;**



- **y = - - x + x - - ;**

1) **4**

3) **3**

4) **3**

2) **4**

decrese first

decrease (x--) = 3

assign first(x--) = 4

Assign last value x=3

- Printf(“%d” ,x);
- Printf(“%d” ,y);

Answer: 3 7

1) - - x :

- decrease value of x first (x=4)
- Assigned last value of x at place (- -x)

2) x - - :

- Assigned value first at place

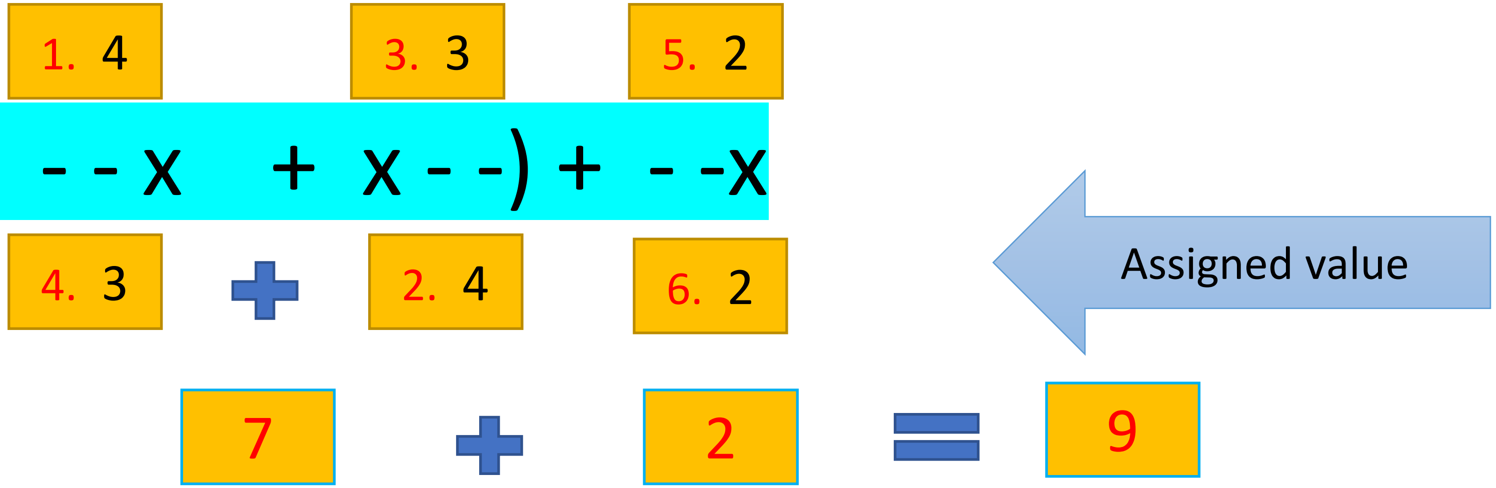
  (x - -) = 4

- decrease value of (x=3)

1) assigned last value of x =3 at place (- -x)

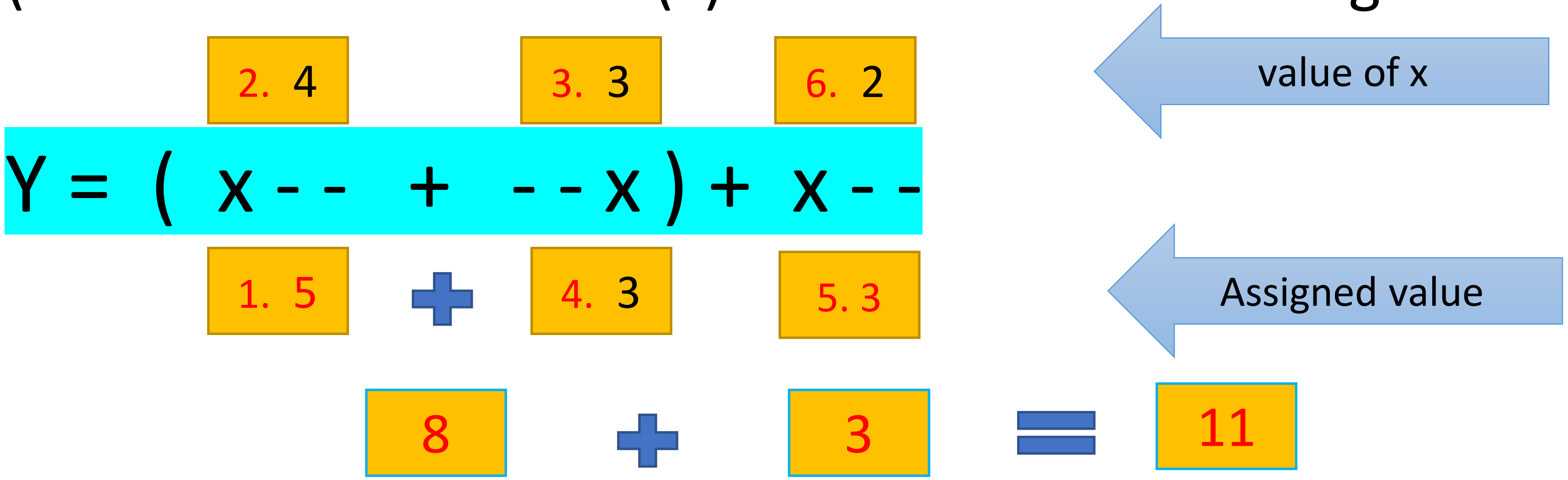
Example

- Compiler evaluate 2 value first then add result to last value
- Int x = 5 , y;
- Y = - - x + x - - + - - x ; // y= (- - x + x - -) + - -x
- (Pre-decrement : value (x) decrease first and assigned to (- -x) last)
- Y = (- - x + x - -) + - -x



Example

- Compiler evaluate 2 value first then add result to last value
- Int x = 5 , y;
- Y = x - - + - - x + x - - ; // y = (x - - + - - x) + x - -
- (Pre-decrement : value (x) decrease first and assigned to (- -x) last)



2. 4

3. 3

6. 2

value of x

- Y = (x - - + - - x) + x - -

1. 5 + 4. 3

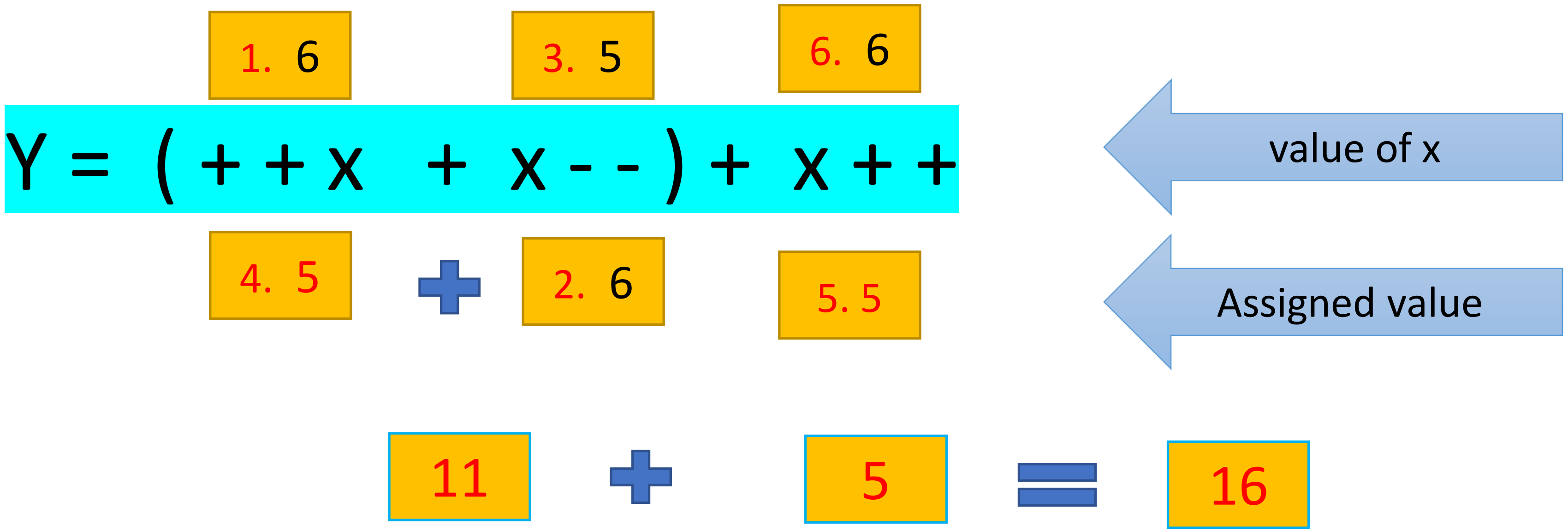
5. 3

Assigned value

8 + 3 = 11

Example

- Compiler evaluate 2 value first then add result to last value
- Int x = 5 , y;
- Y = + + x + x - - + y - - ;



1. 6 3. 5 6. 6

- Y = (+ + x   + x - -) + x + +

4. 5 + 2. 6 5. 5

value of x

Assigned value

11 + 5 = 16

Example

- int i=5;
- printf("%d %d %d", i + + , i , + + i);

stack
++ i (3)
I   (2)
I + + (1)

Evaluation
++ i   (1)
I   (2)
i + + (3)

1. ++ i :
   - Increase value of I=6
   - Assign later i=7 to ++i
2. i
3. i++
   - Assign value to i++ =6
   - Increase value of i=7

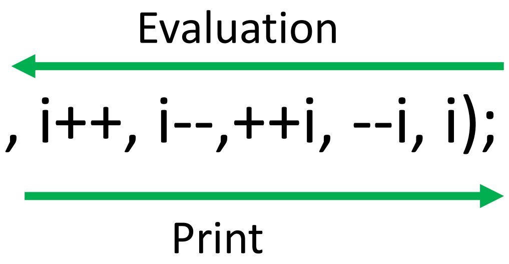
- Print 6 7 7

Example

- int x =120;
- printf("%d %d %d",x, x++,++x);
- First : + + x
    - Increase x so x=121
- Second x++
    - Assign x to x++ so x++=121
    - Increse value of x so x=122
- X=122
- Assign x=122 to ++x so ++x=122

Example

- Int i=3
- printf("%d %d %d %d %d", i++, i--,++i, --i, i); ➔2 3 3 3 3

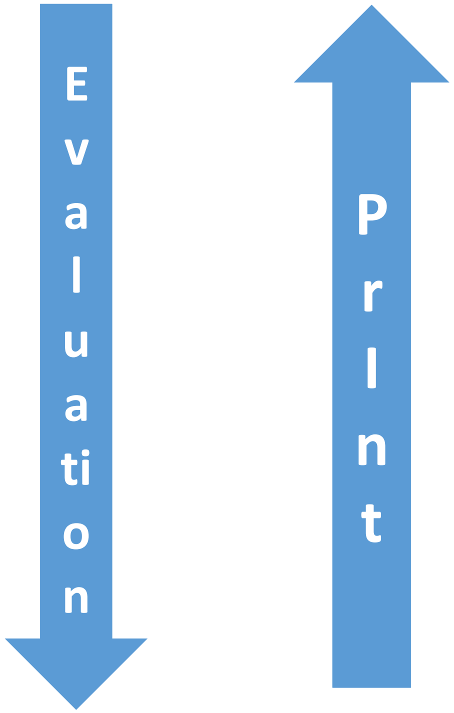


1. I = 3
2. - - I i=2 --I = ? =3
3. + + I i =3 ++I = ? = 3
4. I - - i-- = 3 i=2
5. i++ i++=2 i=3

Example

- Int a=3
- printf("%d %d %d\n",++a, a++,a); ➔5 3 5

1. a = 3 a=5
2. a++ a++=3 a=4
3. ++a a=5 ++a=5



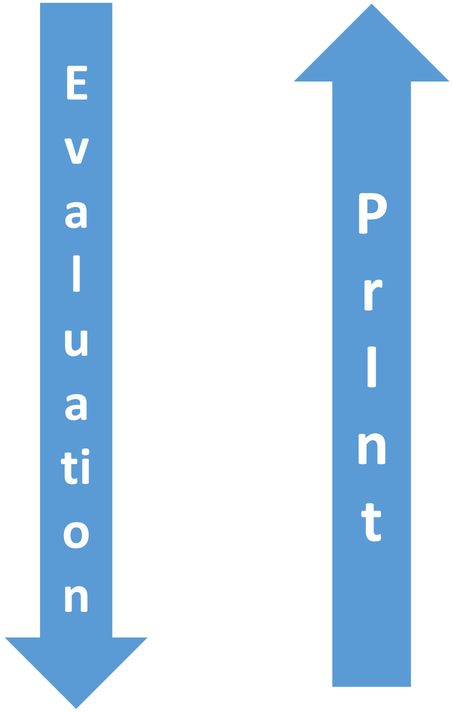
Evaluation

PrInt

Example

- Int j=3
- printf("%d\t %d\t %d\n", j,--j, j--);→ 1 1 3

1. j - - j-- =3 j=2
2. - - j j=1 - -j = ? = 1
3. J=1



Evaluation

Print