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## **PUBLICATIONS BOOKS -**

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12-July-2023

# Programming and Data structures -

Avg marks -  
13 marks

## I. Programming

- Basic Operators, loops, switch, function
- storage, classes, scope
- pointers, strings
- Arrays
- structures, unions
- Recursion
- Dynamic memory allocation

-----> Pointers

- Basics
- pointer to pointer
- pointer to array
- array of pointers
- pointers to strings
- multidimensional arrays
- pointer to function, Structure

Reference

Text Books -

## II. Data Structures

- Linked lists
- Stack
- Queue
- Trees (BST, AVL)
- Hashing

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- 'C' language  
by Dennis Ritchie
- 'C' Test your aptitude  
by Venugopal  
and N. Chandrasekhar
- D.S. by Sahani
- D.S. by Mark Allen Weiss

# I - PROGRAMMING

Operator	precedance	associativity
( )	1 (high)	L → R
↑	2	R → L
* / %	3	L → R
+ -	4	L → R
=	5 (low)	R → L

Associativity : If two or more operators are having same precedence then exp<sup>n</sup> will be evaluated using associativity.

Expression

5/2

5.0/2

5.0/2.0

2/5

2.0/5

2.0/5.0

Result.

2.5

2.5

0

0.4

0.4

NOTE :

If both are integer then O/P will be integer. And, if any one is float then O/P will be float.

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Expression	assigned to int	assigned to float
5	5	5.0
5.0	5	5.0
5/2	2	2.0
5.0/2	2	2.5
5.0/2.0	2	2.5
2/5	0	0.0
2.0/5	0	0.4
2.0/5.0	0	0.4

### Relational and logical operators:

- All the relational and logical operators returns 1 or 0.
- If the expression is true returns 1
- If the expression is false returns 0
- All non-zero is considered as true and zero is considered as false.

	TRUE	FALSE
i) $a = \underbrace{5 > 4}_{\text{TRUE}} = a = 1$	-10	0
ii) $a = \underbrace{(5 > 4)}_{\text{TRUE}} + \underbrace{(3 > 2)}_{\text{TRUE}} \Rightarrow a = 2$	20	0.0
iii) $a = \underbrace{5 > 4}_{\text{TRUE}} > 3; \Rightarrow a = 0$	1.5	%
$= \underbrace{1 > 3}_{\text{false}}$	-0.6	NULL
	30.6	

### Modulus Operator: ( % )

- i.  $15 \% 7 = 1$
- ii.  $-15 \% 7 = -1$
- iii.  $+15 \% -7 = -1$
- iv.  $-15 \% -7 = -1$

v.  $-15.5 \% + 7 = \text{error}$

vi.  $+15.5 \% - 7 = \text{error}$

vii.  $-7 \% + 15 = -7$

viii.  $+7 \% - 15 = +7$

NOTE -

- modulus always gives numerator sign.
- modulus doesn't work on float values. It works only on integers
- If the value is small without sign, then it gives the same value as the o/p.

i.  $\frac{15.0}{2} \% 2 \% 7$   
 $\frac{7.5 \% 2 \% 7}{15.0 \% 7} = \text{error}$

ii.  $\text{int } a = \frac{2 * 3}{4} + \frac{2.0}{5} + \frac{3}{5}$   
 $\frac{6}{4} + 0.4 + 1$

$\text{int } a = 2.4$  then  $a = 2$

$\text{printf}("%d", a) = 2$

iii. `void main ()`

{

`int a = 5;`

`if (a = 8) = True true`  
assignment

{

`printf("Hello");`

}

`else`

{

`printf("Bye");`

}

`printf("%d", a);`

}

a

5

O/p:

Hello

NOTE -

Assignment operator assigns the value and returns assigned value.