CHAPTER - 2: Instructions And Operators

A C program is a Set of Instructions Just like a recipie - which Contains Instruction to prepare a particular Dish

Types of Instruction

(1) Type declaration Instruction
(2) Arithmetic Instruction
(3) Control Instruction

Type declaration Instruction

```
int a;
float b;
```

Other variations:

```
int i = 10; int j = i; int a = 2
int j, = a + j - i;
```

float b = a + 3; float a = 1.1 ⇒ ERROR! as we are trying to use a before defining it

```
int a, b, c, d;
a = b = c = d = 30;
```
⇒ Value of a, b, c & d will be 30 Each

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Arithmetic Instructions

int i = (3*2) + 1 → Operator

Operands

Operands can be int / float etc.
+ - * / are arithmetic Operators

int b=2, c=3
int z; z = b*c; (✓) legal
int z; b*c = z; (x) Illegal (Not allowed)

% → Modulus division Operator -
% → Returns the remainder
% → Cannot be applied on float
% → Sign is same as of numerator (-5%2 = -1)

5%2 = 1 ; -5%2 = -1

Note :-

(1) No Operator is assumed to be present
int i = ab → Invalid
int i = a*b → Valid

(2) There is no Operator to perform Exponentiation in C however we can use pow(x,y) from <math.h> (More later)

Type Conversion

An Arithmetic Operation between
Int and Int → Int
Int and float → float
float and float → float

$5/2 \rightarrow 2$
$2/5 \rightarrow 0$

$5.0/2 \rightarrow 2.5$
$2.0/5 \rightarrow 0.4$
} Important !!

Note :-
Int a = 3.5; In this case 3.5 (float) will be denoted to 3 (Int) because a is not able to store floats

float a = 8; a will store 8.0
$8 \rightarrow 8.0$ (promotion to float)

Quick Quiz :-

Q ⇒ int k = 3.0/9 value of k? and why?
⇒ 3.0/9 = 0.333 but since k is an int, it cannot store floats & value 0.33 is denoted to 0

Operation / Operator precedence in C

3*x - 8*y is (3x) - (8y) or 3(x - 8y)?

In C language simple Mathematical rules like BODMAS, no longer applies

The answer to the above question is provided by Operator precedence & associativity

Operator precedence :- The following table lists the Operator priority in C

Priority	Operators
1st	*/%
2nd	+ -
3rd	=

Operator of higher priority are evaluated first in the absence of parenthesis

Operator Associativity :- when operator of equal priority are present in an expression, the tie is taken care of by associativity.

x * y / z ⇒ (x * y) / z

x / y * z ⇒ (x / y) * z

*, / follows left to right associativity

Control Instruct

Determines the flow of control in a program four types of control instructions in C are:

(1) Sequence Control Instruction
(2) Decision Control Instruction
(3) Loop Control Instruction
(4) Case Control Instruction

CHAPTER 2 - Practice Set

Q13 which of the following is Invalid in C ?

(i) int a; b = a;

(ii) int v = 3^3;

(iii) char dt = '21 Dec 2020';

⇒ Statement 3 is Invalid because in char we

Can Store Only One character

Q2) what data type will 3.0/8-2 return?
A) first Operation 3.0/8 its between float and int so it will be float then after that float and Int (Operation) will still give float.

Q3) Write a program to check whether a number divisible by 97 or not?
A) #include <stdio.h>
int main() {
int a;
printf("Enter the number:")
Scanf("%d", &a)

printf("The value of a%97 is %d", a%97);
return 0;
} (*) If this code will give a output of 0 the the no is divisible and if not it is not divisible by 97

~~Q4)~~

we will further do some some types of problems but with other features which will make our code more readablity and the output will be more clear.

Q4) Explain Step by step Evaluation of 3*x/y-z+k where x=2 y=3 z=3 k=N

⇒ the Step by Step Evaluation will be like

$(3^* x/y) - (z) + (k)$

I II III

there are three components

lets start with 1st Component

3*2/3 ∴ from left to right

2 − 3 + 1

−1 + 1

[0] the value will be 0

Q5 ∴ 3.0+1 will be:

(a) Integer (b) floating point number

(c) character

⇒ floating point number