CS & IT ENGINEERING

C Programming

Control Statements

Lecture No.- 05

By- Satya sir

Recap of Previous Lecture

- for loop
- Examples
- PYQ Solving

Topics to be Covered

- H/W PYQ Solving
- Nested loops
- Jumping statements

Topic : Iterative Control Statements - 2

#Q. Which combination of the integer variables x, y and z makes the variable a get the value 4 in the following expression?

GATE 2008

```
a = ( x > y ) ? (( x > z ) ? x : z) : (( y > z ) ? y : z )
```

(A) x = 3, y = 4, z = 2
(B) x = 6, y = 5, z = 3
(C) x = 6, y = 3, z = 5
(D) x = 5, y = 4, z = 5

(3>4)? False 4>2? True y=4 a=4

(5>4)? True 5>5 False ⇒ a=z ⇒ a=5

Topic : Iterative Control Statements - 2

GATE 2021

#Q. Consider the following ANSI C program.

```
int main()
{
   int i, j, count;
   count=0;
   i=0;
   for (j=-3; j<=3; j++)
      if (( j >= 0) && (i++))
         count = count + j;
   count = count +i;
   printf("%d", count);
   return 0;
}
```

Count 0x36 13

i 0x24 25 26 27

j=-3 -3>=0 { ✓
j=-2 -2>=0
j=-1 -1>=0
False } ✓
i++ ignored

count = count +i; Count = 6+4 = 10

count 0x36

i 0x24 25

o/p: 10

Which one of the following options is correct?

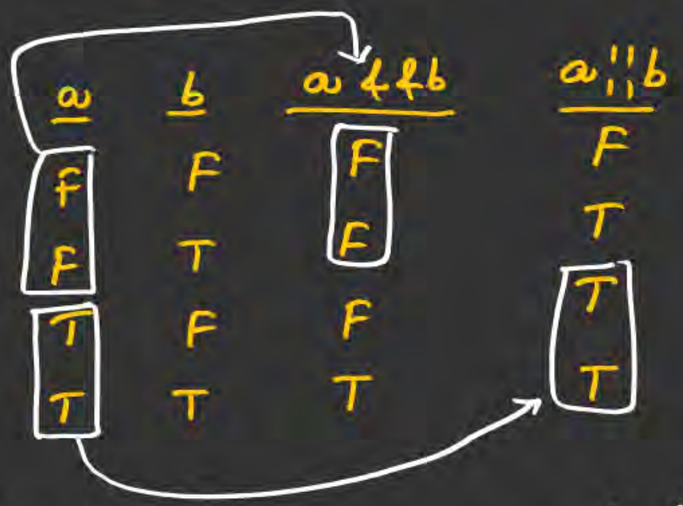
A. The program will not compile successfully
B. The program will compile successfully and output 10 when executed with short-circuit operation
C. The program will compile successfully and output 8 when executed
D. The program will compile successfully and output 13 when executed

j=0 (0>=0) True && 0 = False
j=1 (1>=0) True && 1 = True ⇒ Count = 0+1 = 1
j=2 (2>=0) True && 2 True = True ⇒ Count = 1+2 = 3

j=3
T&&3 ⇒ True
Count = 3+3 = 6

Short-Circuit Operation

It is applicable for only Logical Operators (&&, ||)



&& => while first input Evaluates to False, Then Second Expression is ignored.

|| => while first input is TRUE, Second Expression is ignored.

Topic : Iterative Control Statements - 2

GATE 2015

#Q. Consider the following C program:

```
int main()
{
   int i, j, k = 0;
   j=2 * 3 / 4 + 2.0 / 5 + 8 / 5;
   k-=--j;
   for (i=0; i<5; i++)   {
      switch(i+k)      {
         case 1:
         case 2: printf("\n%d", i+k);
         case 3: printf("\n%d", i+k);
         default: printf("\n%d", i+k);    }
   }
   return 0;      }
```

The number of times printf statement is executed is 10 _____.

j = 2 / 1
k = -1

2*3 = 6
6/4 = 1
2.0/5 = 0.4
8/5 = 1
= 1 + 0.4 + 1 = 2.4
j = 2.4 Truncated

k-=--j
k = k - (--j)
= 0 - 1 = -1

	i+k	Printf Executed	
i=0	0+(-1) = -1	default Printf	1 time
i=1	1+(-1) = 0	default Printf	1 time
i=2	2+(-1) = 1	Case2 Printf, Case3, default	3 times
i=3	3+(-1) = 2	Case2, Case3, default	3 times
i=4	4+(-1) = 3	Case3, default	2 times
		Total Times =	10 times

Topic : Iterative Control Statements - 2

#Q. What will be the output of the following C program segment?

GATE 2012

```
char inChar = 'A';
  switch ( inChar ) {
    case 'A' : printf ("Choice A \ n");
    case 'B' :
    case 'C' : printf ("Choice B");
    case 'D' :
    case 'E' :
    default : printf ("No Choice");
  }
```

A. No Choice
B. Choice A
C. Choice A
   Choice B No Choice
D. Program gives no output as it is erroneous

Topic : Iterative Control Statements - 2

#Q. Let x be an integer which can take a value of 0 or 1. The statement if(x = =0) x = 1; else x = 0; is equivalent to which one of the following?

GATE 2004

(A) x = 1 + x;
(B) x = 1 – x;
(C) x = x – 1;
(D) x = 1 % x;

```
if (x==0)
    x=1
else
    x=0
```

Let x=1

if(False)

x=0

a) x=1+1 ⇒ x=2
b) x=1-1 ⇒ x=0
c) x=1-1 ⇒ x=0
d) x=1%1 ⇒ x=0

Let x=0

if(TRUE)

x=1

a) x=1+0 ⇒ x=1
b) x=1-0 ⇒ x=1
c) x=0-1 ⇒ x=-1
d) x=1%0 Undefined.

Topic : Jumping Statements

j = 3 2 1 0

Nested Loops : A Loop inside another loop.

Ex: 1

```
int i=1, j=3;
while( i<5)
{     while(j>0)
      {  Printf(" %d %d \n", i, j);
         j--;
      }
   i = i+2;
}
```

i=1 1<5 True

j=3	j=2	j=1	j=0
3>0 True	2>0 True	1>0 True	0>0 False
Print 1, 3	Print 1, 2	Print 1, 1	

i=3 3<5 True 0>0 False

i=5 5<5 False

o/p: 1 3
1 2
1 1

Topic : Jumping Statements

Ex: 2

```
int i=5, j=1;
for(; i>1; i--)          // Loop never Ends
                         // i=5
    for(; j<5; j+=2)
        Printf("%d %d", ++i, j--);
                         // i=6
```

o/p: Infinite Execution.

Topic : Jumping Statements

Ex: 3

```
int i=5, j=1;
for(i; i>1; i--)
{
    for(j; j<i; j+=2)
        Printf("%d %d \n", i, j);
}
```

		j=1	j=3	j=5
i=5	5>1 True	1<5 True	3<5 True	5<5 False
i=4	4>1 True	5<4 False		
i=3	3>1 T	5<3 F		
i=2	2>1 T	5<2 F		
i=1	1>1 False			

o/p: 5 1
5 3

2 mins Summary

THANK - YOU