Computer Science & IT

C Programming

Control Flow Statement

Lecture No. 02

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Recap of Previous Lecture

- Topic — Scope of variable
- Topic — printf statement
- Topic — Ternary operator
- Topic
- Topic

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Topics to be Covered

- Topic — If else ✓
- Topic — If else if ✓
- Topic — Switch ✓
- Topic
- Topic

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```
int a=10, b=14
a=4? printf("%d", a) : printf("%d", b)
```

expr ? statement$_1$: statement$_2$

Least precedence

output: 10

Control Flow Statement

Sequential Flow of Execution:

Statements are executed one after another in Sequential manner;

```
S1;
S2;
S3;
S4;
S5;
S6;
```

Control flow statement changes Sequential flow of execution

Types of Control Flow statement

if statement

```
if ( condition ) {

}
```

if condition is true then block followed by if will executed

```
S1;
S2;
if (condition) {
S3;
S4;
}
S5;
S6;
S7;
```

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Types of Control Flow statement

- Selection or Branching or Decision or Conditional
- Iterative statement
- Jump statements

Selection or Branching or Decision or Conditional

1. If statement

Non zero – true

Zero – false

```
if(condition){

}
```

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if statement Example

```
#include <stdio.h>
int main (){
      int a = 10;
      if( a < 20) {
         printf("a is less than 20\n" );
      }
      printf("value of a is : %d\n", a);
      return 0;
}
```

Relational Expression

S_1

10 < 20

S_2

S_3

output:

a is less than 20
value of a is 10

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if statement Example

```
#include<stdio.h>
int main() {
    printf("1"); // 1
    printf("2"); // 2
    if(10>20){
        printf("3");
    }
    printf("4"); //4
    return 0;
}
```

false

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if statement Example

```
#include <stdio.h>
      int main (){
            int a = 10
            if(a+2) {
                  printf("Namaskar" );
            }
            printf("Dosto");
            return 0;
}
```

if (12) → Non zero → True

"Namaskar Dosto"

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if statement Example

```
# include <stdio.h>
int main(){
    int a=10
    if(a+2){
        { printf("Namaskar ");
          printf(Dosto);
    }
}
```

another statement

```
if (a>2)
    printf("Namaskar");
printf(Dosto);
```

part of if

Namaskar Dosto

Namaskar Dosto

if(a<2)
then only "Dosto"

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if we dont create the block then only consecutive statement considered as part of if statement.

if statement Example

```
#include <stdio.h>
      int main (){
            int a = 10
            if(a-10) {
                  printf("Namaskar" );
            }
            printf("Dosto");
            return 0;
}
```

10-10 = 0

Dosto

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Question

```
#include <stdio.h>
int main (){

    int i=0;
    if(i++){
        printf("Namaskar");
    }
    printf("\t Dunia");
    return 0;
}
```

(A) NamaskarDunia

(B) Namaskar Dunia

(C) Namaskar

(D) Dunia

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Question

```
#include <stdio.h>
int main (){
        int a=0;
        if(a++);
        {
                a = a+10;
                a = a-5 ;
        }
        printf("%d", a);
        return 0;
}
```

Semicolon ← if(a++);

There is No effect of if

Local a: 0 → 1 → 11 → 6

6

Scope

(A) 5 (B) 6 ✓ (C) 15 (D) 20

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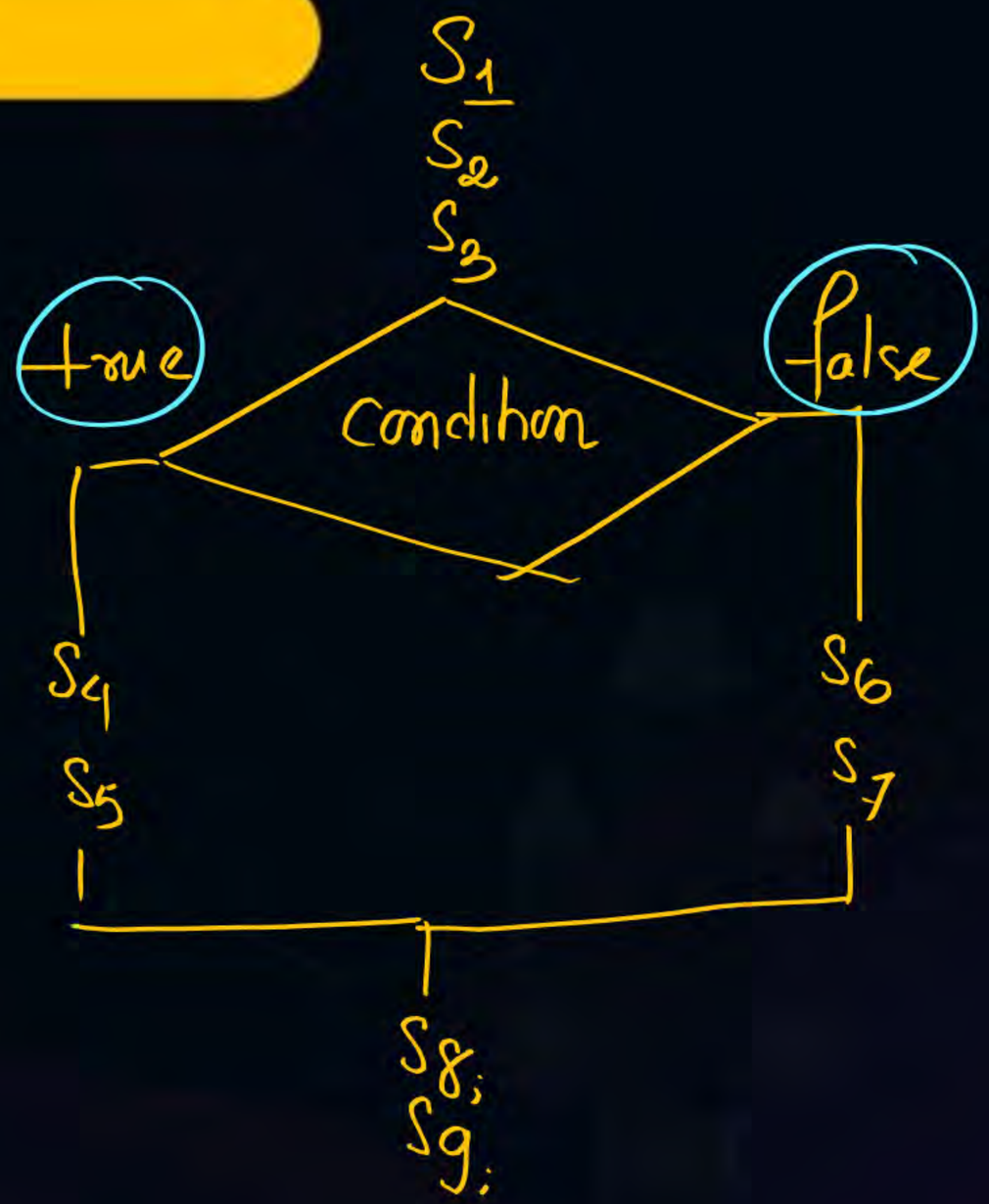
If Else Statement

```
S1;
S2
S3
if (condition) {
   S4;
   S5;
} else {
   S6
   S7
}
S8;
S9;
```



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If else Statement

```
int main(){
      s1;
      if(condition/expression){
            s2;
            s3;
      }
      else {
            s4;
            s5;

      }
      s6;
}
```

True

false

Question

```
#include <stdio.h>
     int main (){

          int i=1;
          if(i+2-3){
               printf("Hello friends");
          }
          else
               printf("mai bhi hu");
          return 0;
}
```

(a) Hello friends
(b) mai bhi hu ✓ [b]
(c) Hello frinds mai bhi hu
(d) No Output

1+2-3 = 3-3 = 0

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Question

```
#include <stdio.h>
     int main (){

          int i=0;
          if(i++){
               printf("Hello friends");
          }
          else
               printf("mai bhi hu");
          return 0;
}
```

(a) Hello friends
(b) mai bhi hu [B]
(c) Hello frinds mai bhi hu
(d) No Output

if(0)

Question

```
#include <stdio.h>
     int main (){
          int i=1;
          if(i++){
               printf("Hello friends");
          }
          else;
               printf("\tmai bhi hu");
          return 0;
}
```

(a) Hello friends
(b) mai bhi hu
(c) Hello frinds mai bhi hu
(d) No Output

Number is Even or Odd

```
# include<stdio.h>
int main(){
    int a;
    scanf("%d", &a);
    if(a%2==0)
        printf("Even No.");
    else
        printf("odd No.");
}
```

Address of user Input

Slide

Even Odd, ternary Operator

```
(a%2) ? printf("odd No") : printf("Even No");
```

yes

No

Slide

Even Odd, ternary Operator

```
#include <stdio.h>
      int main() {
       int num;
       printf("Enter an integer: ");
       scanf("%d", &num);
      (num%2==0)?printf("%d is even.", num):printf("%d is odd.", num);
      return 0;
      }
```

Home Work

Decide the grade based on the marks

If marks <50 then Grade is E
if marks >=50 <60 then Grade is D
if marks >=60 <70 then Grade is C
if marks >=70 <80 then Grade is B
if marks >=80 <90 then Grade is A
if marks >=90 then Grade is A+

User Input marks

```
if (marks >=90 && marks
                <=100)
        point
else if(mark>=80 && mark<90){

}
```

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Home Work

Decide the grade based on the marks

```
    if marks >=70 <80 then Grade is B
    if marks >=80 <90 then Grade is A
    if marks >=90 then Grade is A+
```

Switch statements

Switch, case

Switch statement allows a variable (expression) to tested for equality against list of value. Each value in list is called a Case.

Application

Menu

Switch
case
defaut
break;

Syntax

```
Switch (Expression) {
    case constant expression :
        statement...
        break;
    case constant expression:
        statements
        break;
    :
    defaut: statements
        break;
}
```

break, defaut optional

if No case is equal the defaut executed.

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Switch Syntax

```
switch(expression){
    case constant-expression  :
       statement(s);
       break; //optional
    case constant-expression  :
       statement(s);
       break; //optional

    // you can have any number of case statements.
    default : //Optional
       statement(s);
}
```

```
# include<stdio.h>
 int main(){
     int a=4;
     Switch(a+1){
          case 5: printf("case5"); break;
          case 6 : printf("case 6); break;
          default : printf("default); break;
      }
}
```

variable Switch(a) = default

expression Switch(5) = case 5

If No break statement

if No break statement then
all consecutive cases evaluates to true.

until break comes or end of switch comes

Question

```
#include <stdio.h>
      int main(){
       int a = 5;
        switch(a){
                case 4: printf("%d",5);
                case 5: printf("%d",5);
                case 6: printf("%d",6);
        }
      }
```

56

56

Question

```
#include <stdio.h>
      int main(){
       int a = 5;
        switch(a-1){
                  case a: printf("%d",5);
                  case 5: printf("%d",5);
                  case 6: printf("%d",6);
        }
      }
```

Question

```
#include <stdio.h>
int main(){


    switch(13/4){
        case 4: printf("%d",4); break ;
        case 3: printf("%d",2); break ;
        case 5: printf("%d",5); break ;
}
    }
```

GATE 2012

What will be the output of the following C program segment?

```
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

choic A
choice B Nochoice

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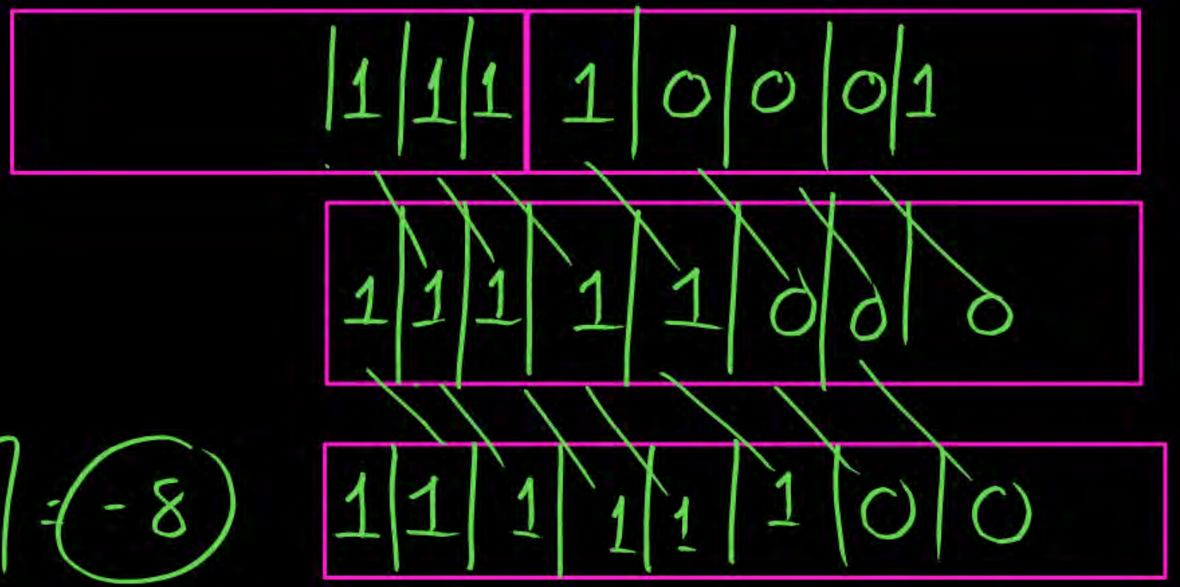

left shift

Same as +ve

$$-\left\lceil \frac{x}{2^k} \right\rceil$$

$$-\left\lceil \frac{15}{2} \right\rceil = -\lceil 7.5 \rceil = (-8)$$

if all bits 1 then -4

$k = 1$

value is -1 and it will Not change

2 mins Summary

Topic if statement

Topic if else

Topic Switch statement

Topic

Topic

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THANK - YOU