Unit II

Decision Control Statements

if, if-else, Nested if else, else if ladder, Switch statement, Break, Continue, goto statement.

Dr. Md Tarique Jamal Ansari
Assistant Professor
Department of Computer Application
Integral University, Lucknow
Email: tjansari@iul.ac.in

Decision Control Statements

1. The if Statement

Different forms of implementation if-statement are:

a) Simple if statement
b) If-else statement
c) Nested if-else statement
d) Else if statement

a) Simple if statement

The syntax is as follows:

if (condition)

statement;

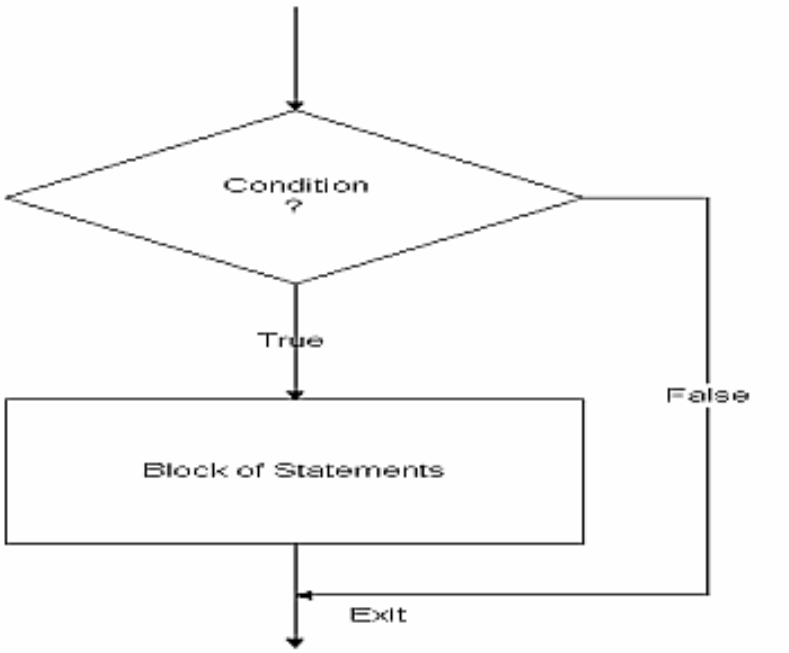


Figure: Simple if statement

Example: Simple if statement

```
#include <stdio.h>
int main()
{
        int x = 20;
        int y = 22;
        if (x<y)
        {
        printf("Variable x is less than y");
        }
        return 0;
}
```

Output:

```
Variable x is less than y
```

b) If … else statement

```
if (condition)
Statement _1;
else
Statement_ 2;
statement_3;
Or
if (condition)
{
Statements_1_Block;
}
else
{
Statements_2_Block;
}
Statements _3_Block;
```

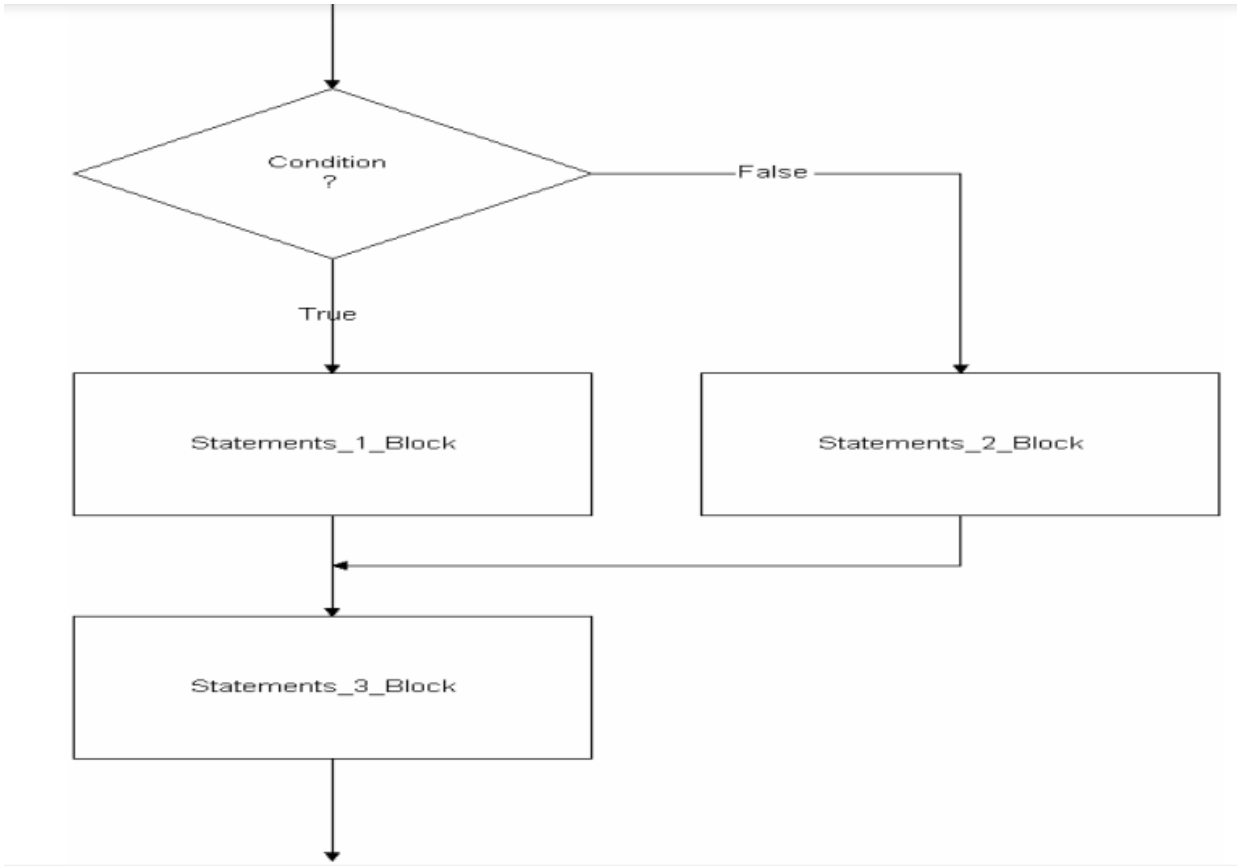


Figure: If…else statement

Example: If … else statement

```
/* Program to print whether the given number is even or odd*/
#include <stdio.h>
main ( )
{
int x;
printf(“Enter a number:\n”);
scanf("%d",&x);
if (x % 2 == 0)
        printf(“\nGiven number is even\n”);
        else
        printf(“\nGiven number is odd\n”);
}
```

OUTPUT

```
Enter a number:
6
Given number is even

Enter a number
7
Given number is odd
```

c) Nested if…else statement

```
if (condition_1)
   {
     if (condition_2)
        {
          Statements_1_Block;
        }

    else
        {
          Statements_2_Block;
        }
    }

else
      {
        Statements_3_Block;
      }
Statement_4_Block;
```

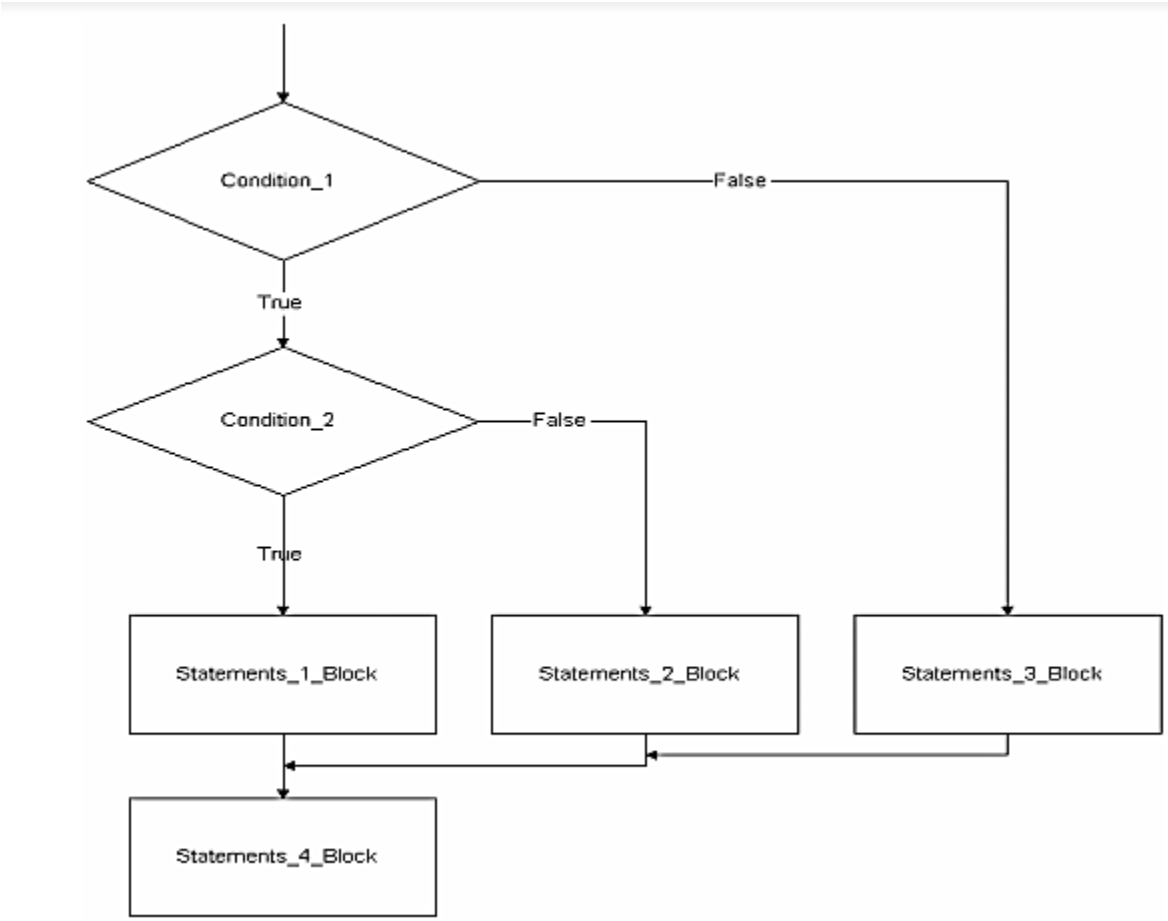


Figure: Nested if…else statement

Example: Nested if…else statement

```
#include<stdio.h>
int main()
{
        int num=1;
        if(num<10)
        {
                if(num==1)
                {
                        printf("The value is:%d\n",num);
                }
                else
                {
                        printf("The value is greater than 1");
                }
        }
        else
        {
                printf("The value is greater than 10");
        }
        return 0;
}
```

Output:

```
The value is:1
```

d) Else if statement

```
if (condition_1)
    {
    Statements_1_Block;
    }
    else if (condition_2)
        {
            Statements_2_Block;
        }
                ----------
                        else if (condition_n)
                            {
                                Statements_n_Block;
                            }
else
    Statements_x;
```

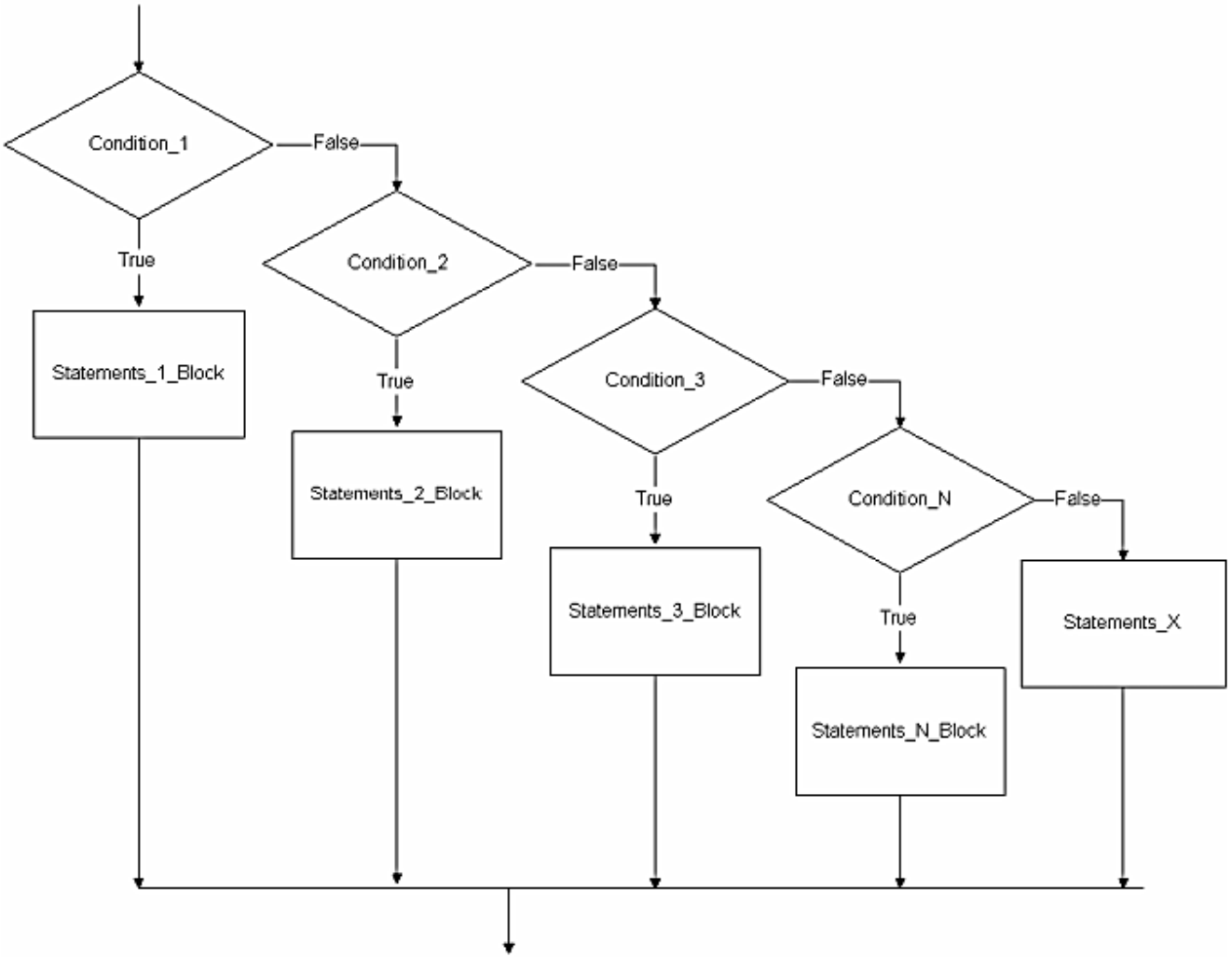


Figure: Else if statement

Example: Else if statement

Example

Write a program to award grades to students depending upon the criteria mentioned below:

- Marks less than or equal to 50 are given “D” grade
- Marks above 50 but below 60 are given “C” grade
- Marks between 60 to 75 are given “B” grade
- Marks greater than 75 are given “A” grade.

Cont..

```
/* Program to award grades */
#include <stdio.h>
main()
{
int result;
printf("Enter the total marks of a student:\n");
scanf("%d",&result);
if (result <= 50)
        printf("Grade D\n");
    else if (result <= 60)
            printf("Grade C\n");
        else if (result <= 75)
                printf("Grade B\n");
            else
                printf("Grade A\n");
}
```

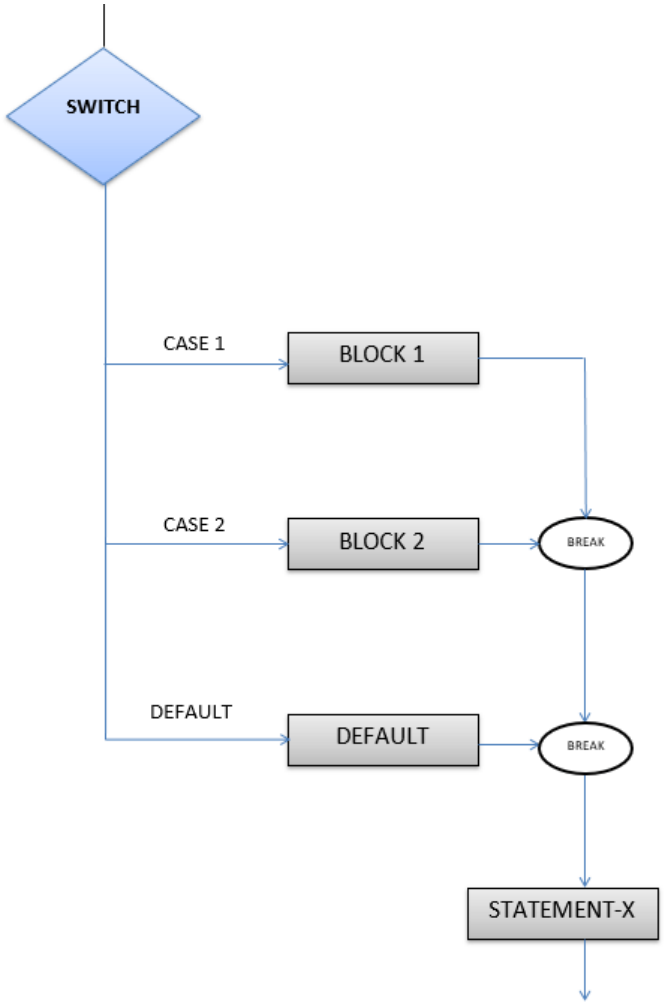
OUTPUT

```
Enter the total marks of a student:
80
Grade A
```

Decision Control Statements

2. Switch Statement

```
switch (expression){
        case expression 1:
                        block of instructions 1
                        break;
        case expression 2:
                        block of instructions 2
                        break;
        .
        .
        default:
                default block of instructions
        }
```



Example: Switch Statement

```c
#include <stdio.h>
int main() {
    char operator;
    double first, second;
    printf("Enter an operator (+, -, *,): ");
    scanf("%c", &operator);
    printf("Enter two operands: ");
    scanf("%lf %lf", &first, &second);

    switch (operator) {
    case '+':
        printf("%.1lf + %.1lf = %.1lf", first, second, first + second);
        break;
    case '-':
        printf("%.1lf - %.1lf = %.1lf", first, second, first - second);
        break;
    case '*':
        printf("%.1lf * %.1lf = %.1lf", first, second, first * second);
        break;
    case '/':
        printf("%.1lf / %.1lf = %.1lf", first, second, first / second);
        break;
        // operator doesn't match any case constant
    default:
        printf("Error! operator is not correct");
    }

    return 0;
}
```

```
Enter an operator (+, -, *,): *
Enter two operands: 1.5
4.5
1.5 * 4.5 = 6.8
```

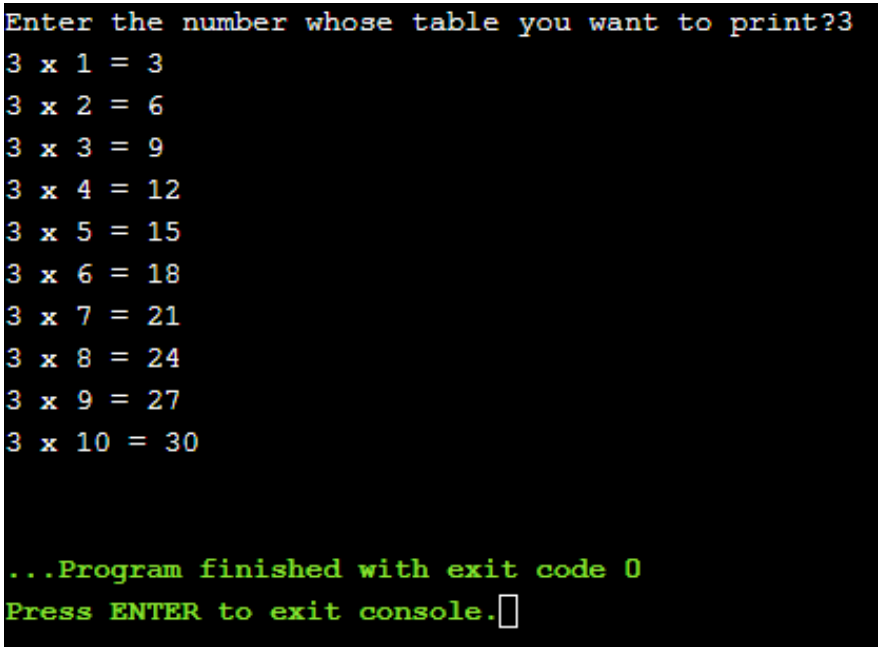
THE goto STATEMENT

The syntax is as follows:

goto label;

Example: Goto Statement

```
#include <stdio.h>
int main()
{
  int num,i=1;
  printf("Enter the number for table?");
  scanf("%d",&num);
  table:
  printf("%d x %d = %d\n",num,i,num*i);
  i++;
  if(i<=10)
  goto table;
}
```



THE break STATEMENT

The syntax is as follows:
break;

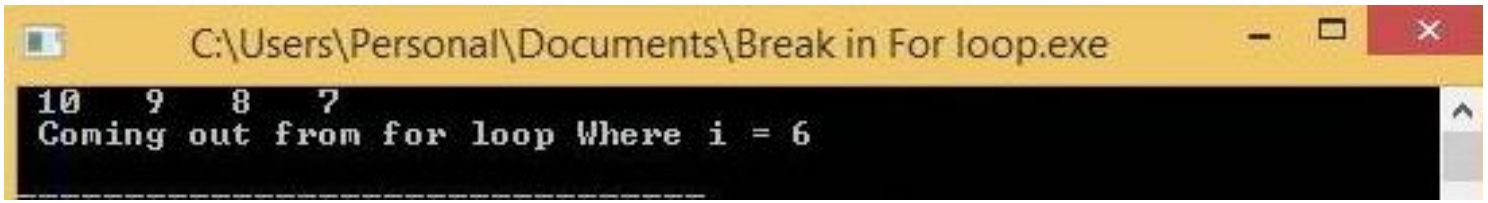
```
/* Break statement in C Programming example */

#include <stdio.h>

int main()
{
 int i;

 for(i=10;i>0; i--)
 {
  if(i==6)
   {
     printf("\n Coming out from for loop Where i = %d\n", i);
     break;
   }
  printf(" %d  ",i);
 }

}
```



THE continue STATEMENT

The syntax is as follows:

continue;

```
#include <stdio.h>
int main()
{
  for (int j=0; j<=8; j++)
  {
    if (j==4)
    {
            continue;
     }
printf("%d ", j);
  }
  return 0;
}
```

```
0 1 2 3 5 6 7 8

...Program finished with exit code 0
Press ENTER to exit console.
```