DECISION MAKING STATEMENTS

The order in which the program statements are executed is known as flow of control. Decision making statements alters the default flow of control. There are 2 types of decision making statements. They are,

- ✓ Conditional Branching Statements
- ✓ Unconditional Branching Statements

Conditional Branching Statements

In conditional branching, program control is transferred from one point to another basedupon the outcome of the condition. The conditional branching statements are:

a) if Statement

b) if-else Statement

c) Nested if Statement

d) if else if else statement

e) switch Statement

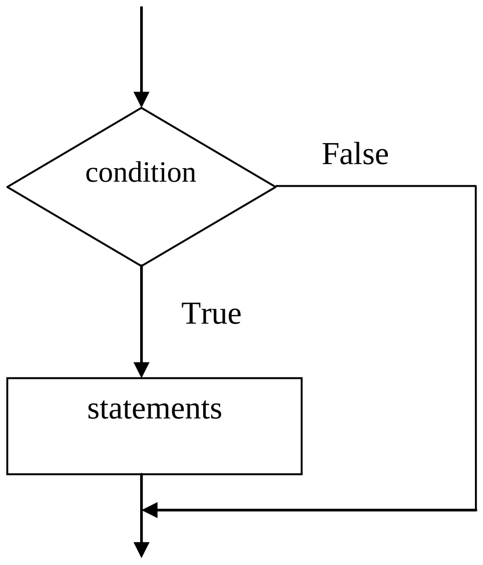
a) Simple if Statement

It check the given condition in if statement. If it is true then it will execute the body of ifstatement, otherwise it skipped the body of if statement.

Syntax:

```
if (condition)
{
        Statement block
}
```

Flow Chart:



Program : Program To Check Whether The Number Is Positive

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

        int a;

        printf ("\n  Enter  a  number  :  ");
        scanf ("%d", &a);
        if ( a > 0)

                printf  ("The  given  number  is  positive  number");
        getch();

}
```

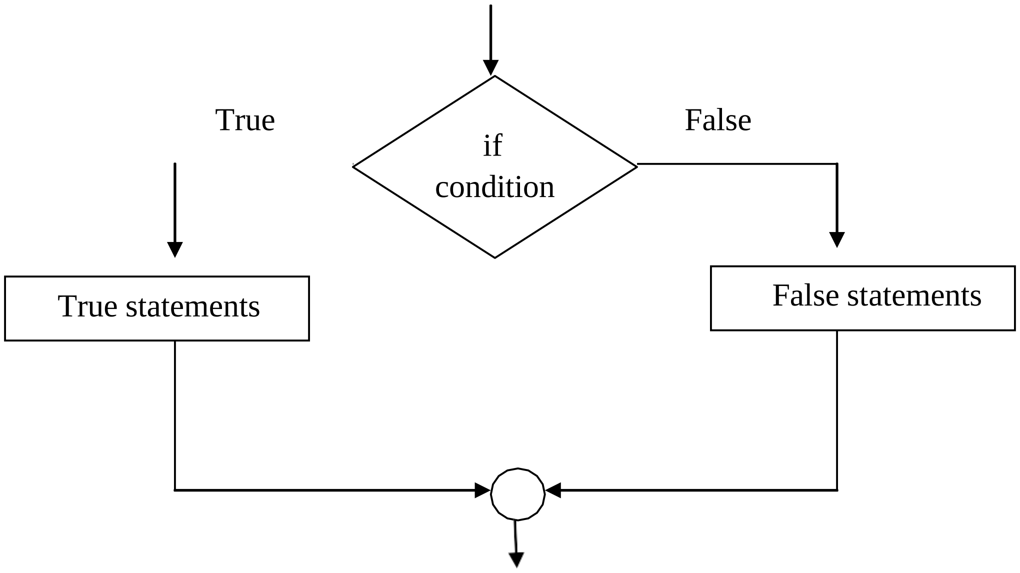
Output

```
Enter a number :7

The given number is positive number
```

b) if - else Statement

It is a two way branching statement. If the condition is true then the True part statementwill be executed.If the condition is false then the False part statement will be executed.

Flowchart:



Syntax:

```
        if ( condition)
        {
                True part Statement
        }
        else
        {
                False part Statement
        }
```

Program: Check Whether the Number Is Odd Or Even

```
#   include<stdio.h>
#include<conio.h>
void main ( )
{
        int n, r;
        printf  ("\n  Enter  a  Number:");
        scanf ("%d", &n);
        r = n % 2; if
        ( r == 0 )
                printf ("Given Number is Even");
        else
                printf ("Given Number is Odd");
        getch();
}
```

Output:

```
Enter a Number: 6 Given
Number is Even
```

c) Nested if Statement

The if statement within another if statement is called as nested if statement.

Syntax:

```
        if ( condition1 )
        {
                if ( condition2)
```

```
          {
                    Inner if True part Statement
          }
          else
          {
                    Inner if False part Statement
          }
}
else
{
          Outer if False part Statement
}
```

It checks the condition1 and if it is true it check the inner if condition2. This type ofnested if is useful when a series of decisions are involved.

Program :

```
# include<stdio.h>
#include<conio.h>
void main ( )
{
          int Mark;
          printf (“Give your Mark”);
          scanf (“%d”, &Mark);
          if ( Mark < 50 )
                    printf(“Failed”);
          else
          {
                    if ( Mark < 60 )
                              printf(“Second Class”);
else
                              printf (“First Class”);
          }
```

```
                getch();
        }
```

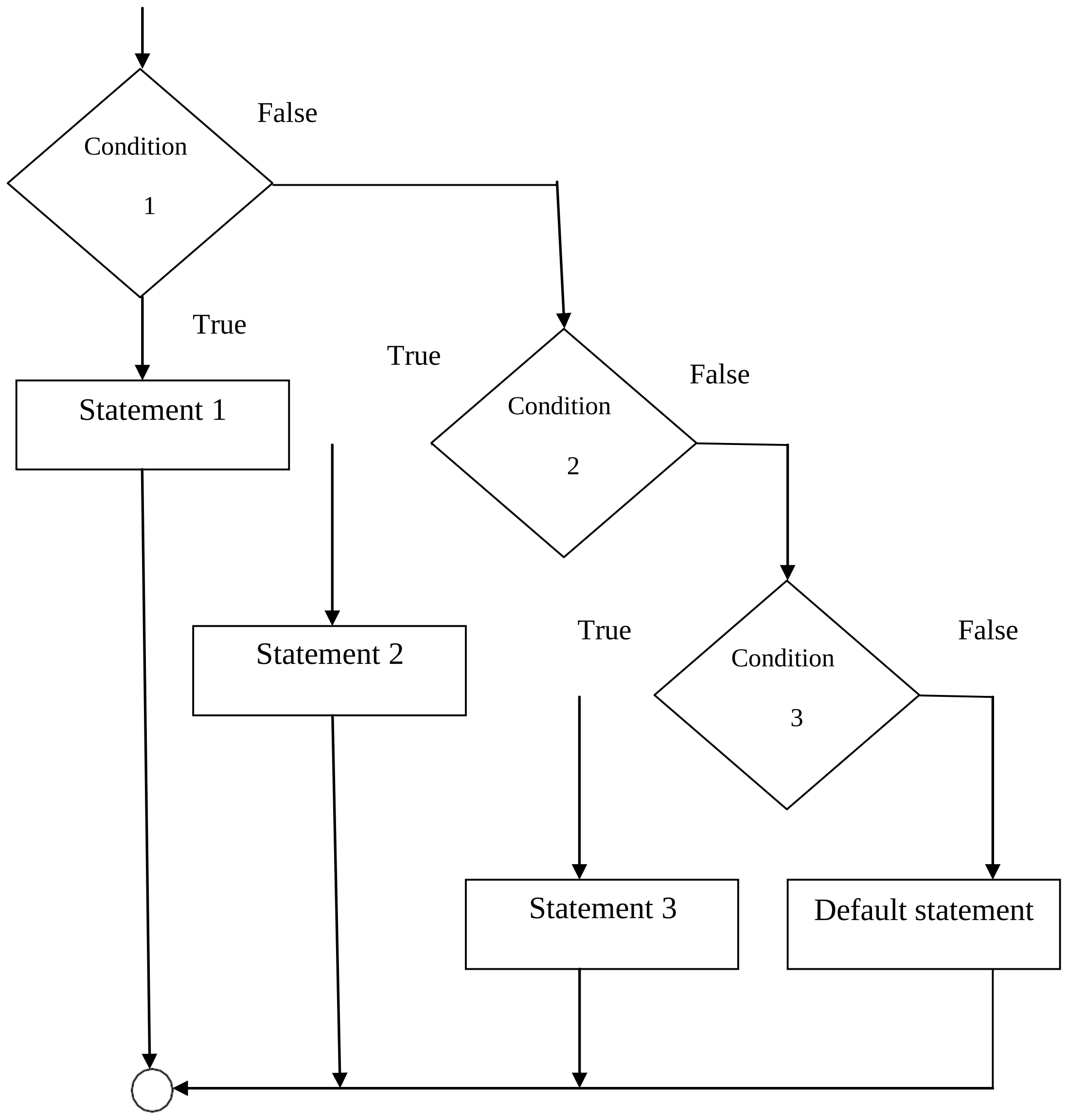
Output

```
Give  your  mark  :  68
First class
```

d) if-else if- else statement

If the else part of if statement contain another if statement, then the else and the ifstatement can be combined. It is called else if ladder.

Flowchart:



Syntax :

```
if ( condition1 )

        Statement  block  1
else if ( condition2)
        Statement  block  2
else if ( condition3 )
        Statement block 3

else

        Statement block 4
```

If the condition1 evaluated is true, the statement block1 is executed. If the condition2 is true, then statement block2 is executed and so on. If none of the conditions are true, then the statement block4 is executed.

Program : Find Largest Among Three Numbers

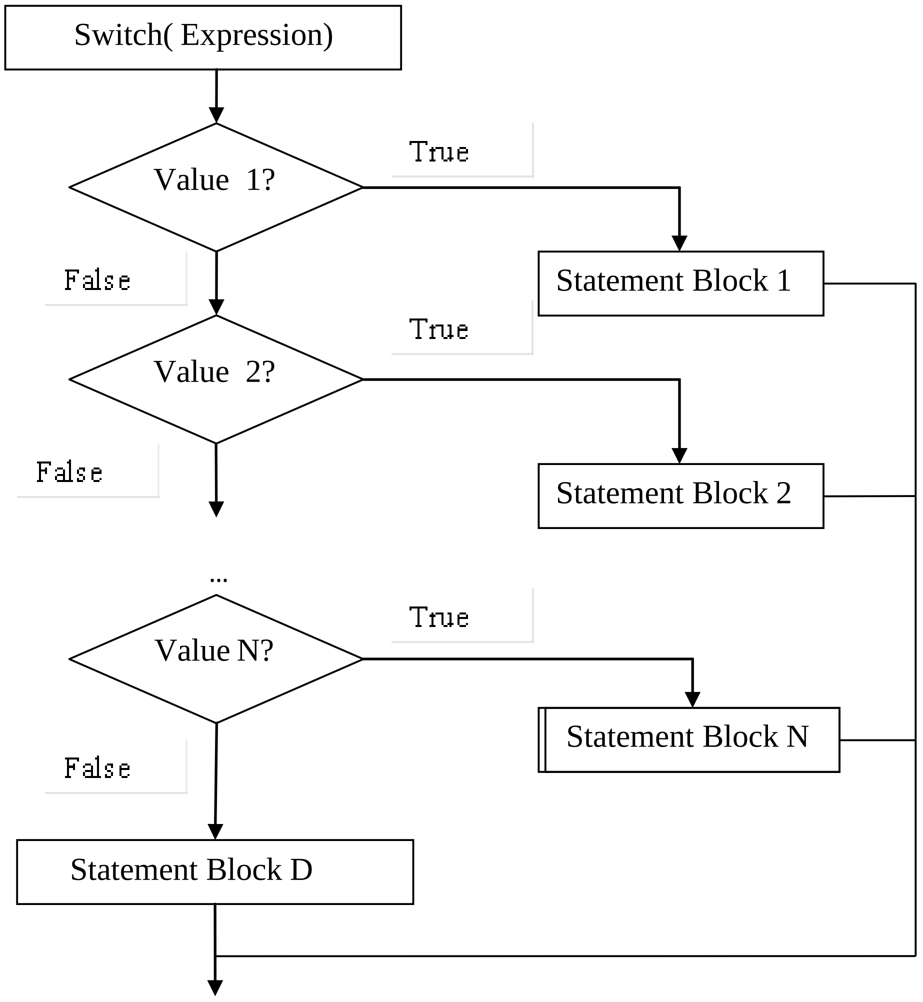
```
#   include<stdio.h>
#include<conio.h>
void main ( )
{

        int a, b, c;

        printf (“Enter three numbers : ”); scanf
        (“%d %d %d”, &a, &b, &c);if (a > b)
        && (a > c)
                printf(“Biggest Number is %d”, a);else
        if (b > c)
                printf(“Biggest Number is %d”, b);

        else

                printf (“Biggest Number is %d”, c);

        getch();

}
```

Output :

```
Enter three numbers : 40 -50 35Biggest
Number is 40
```

e) switch Statement

It is a multi way branching statement. It first evaluates the expression in switch statement.That result is compared with each case value one by one. Whenever a match found, it execute thestatements given in the corresponding case statement.If none of the case value matches with the result it executes the default section.



Syntax:

```
switch (Expression)
{
        case value 1:
                Statement  block  1
                break;
        case value 2:
                Statement  block  2
                break;
                . . .
        case value n:
                Statement  block  n
                break;
         default:
                Default Statement block }
```

Rules for Writing Switch Statement

- ✓ The expression used in switch statement must be an integer or a character data.
- ✓ The case labels must be character or integer constant.
- ✓ Each case block must be terminated by break statement. Otherwise, all statementsthat are followed by matched cases are executed.
- ✓ The default clause is optional & usually placed at the end.
- ✓ The case keyword must terminate with colon (:)
- ✓ No two case constants are identical.

Unconditional Branching Statement

In an unconditional branching, program control is transfer from one point to anotherwithout checking the condition. Following are the unconditional branching statements.

i) goto

ii) break

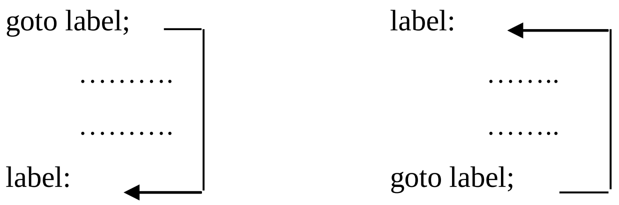
iii) continue

iv) return

i) goto Statement

- ✓ „C" provides the goto statement to transfer control unconditionally from one place toanother place in the program.
- ✓ The goto statement can move the program control almost anywhere in the program.
- ✓ The goto statement requires a label.

Syntax:



```
goto label;                label:
        ……….                       ……..
        ……….                       ……..
label:                     goto label;
```

Program : Check Whether the Given Number is Prime or Not Using goto & return.

```
# include<stdio.h> #
include<conio.h>
void main ( )
{
        int No, i;
        printf (“Give the number : ”);
        scanf (“%d” , &No);
        for ( i = 2 ; i <= No / 2; i++ )
        {
                if ( No / i == 0 )
                        goto stop;
        }
        printf (" Given Number is a  Prime Number");
        return;
    stop : printf (" Given Number is not a  Prime Number");
    }
```

Output:

```
    Give the number :  17
    Given Number is a Prime Number
```

ii) break Statement

- ✓ It is used within a looping statement or switch statement.
- ✓ The break statement is used to ***terminate the loop***.
- ✓ In switch statement each case block must be terminated with break statement to exitfrom switch.

Syntax:

```
        break;
```

Example:

Refer switch example program.

iii) continue Statement

- ✓ It is used within looping statements.
- ✓ When the continue statement is used inside the loop, it skip the statements which areavailable after this statement in the loop and go for the next iteration.

Syntax:

```
        continue;
```

Program : Display 1 To 10 Except 5#

```
include<stdio.h>
#include<conio.h>
void main ( )
{
        int i;
        for (i =1; i <= 10; i++ )
        {
                if ( i == 5 )
                        continue;
                printf  ("  %d    ",  i);
                getch();
        }
```

Output:

```
1 2 3 4 6 7 8 9 10
```

break	**continue**
Break statement takes the control to the outside of the loop	Continue statement takes the control tothe beginning of the loop.
It is used in loop & switch statements	This can be used only in loop statements

Difference Between break and continue Statements

(d) return Statement

A return statement terminates the execution of a function and returns the control to thecalling function.

The general form of a return statement is

```
return;
   OR

return
  expression;

  OR

return(expression);
```