CS1100 – Introduction to Programming

Lecture 7

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Goals:

- Selection statements:
  - Single Selection : if
  - Double Selection : if else
  - Multiple Selection: switch

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- Selection statements:
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  - Double Selection : if else
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- Need for different kinds of selection and loops.
- Control flow for each of the constructs.

Single Selection : `if` construct

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if (condition)
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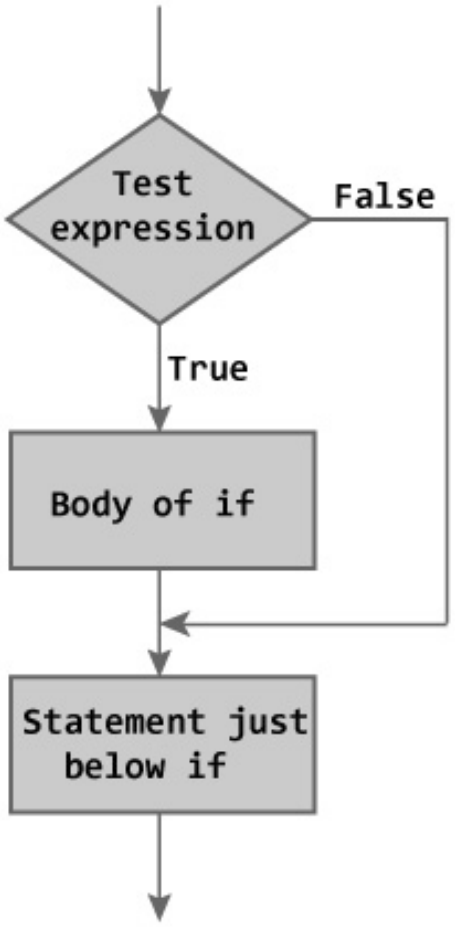

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Example :

```
/* Program to display a number
   if user enters negative number.
   If user enters positive number,
   that number won't be displayed. */

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

    printf("Enter an integer: ");
    scanf("%d", &number);

    if (number < 0)
    {
        printf("You entered %d.\n", number);
    }

    printf("The if statement is easy.");
}
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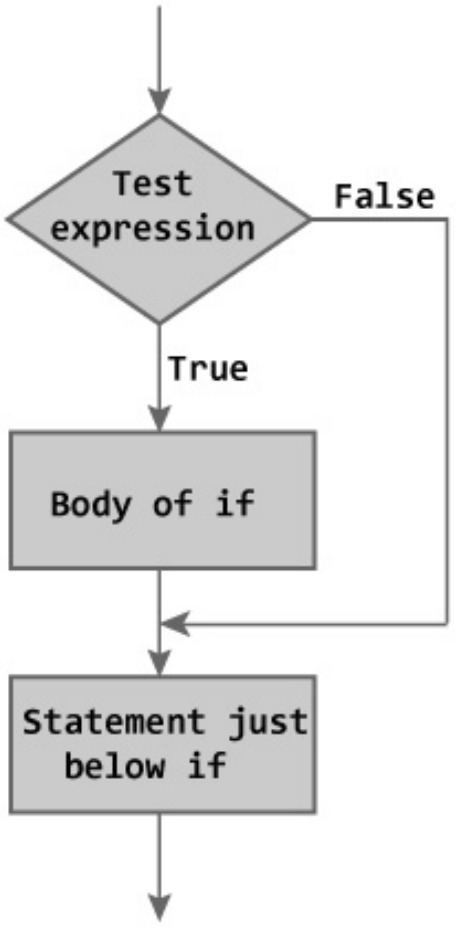

Single Selection : `if` construct

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   if user enters negative number.
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    scanf("%d", &number);

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    printf("The if statement is easy.");
}
```

Output :

```
Enter an integer: -2
You entered -2.
The if statement is easy.

-------------------------

Enter an integer: 5
The if statement in C programming is easy.
```

Double Selection : `if-else` construct

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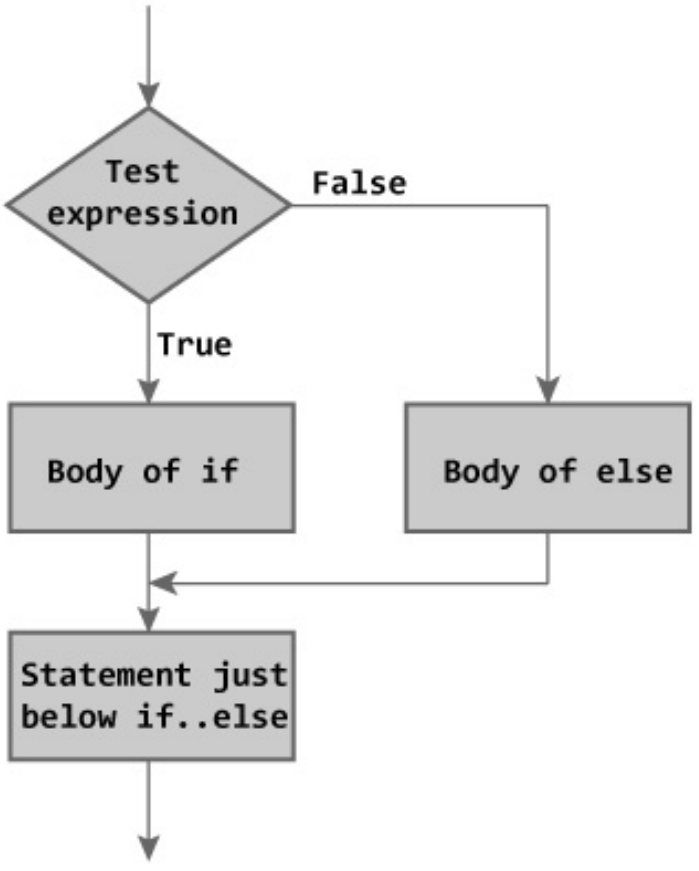

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Double Selection : `if-else` construct - Example

Example :

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// Program to check whether an
// integer entered by the user
// is odd or even

#include <stdio.h>
int main()
{
    int number;
    printf("Enter an integer: ");
    scanf("%d",&number);

    // True if remainder is 0
    if( number%2 == 0 )
        printf("%d is an even integer.",number);
    else
        printf("%d is an odd integer.",number);
    return 0;
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Double Selection : `if-else` construct - Example

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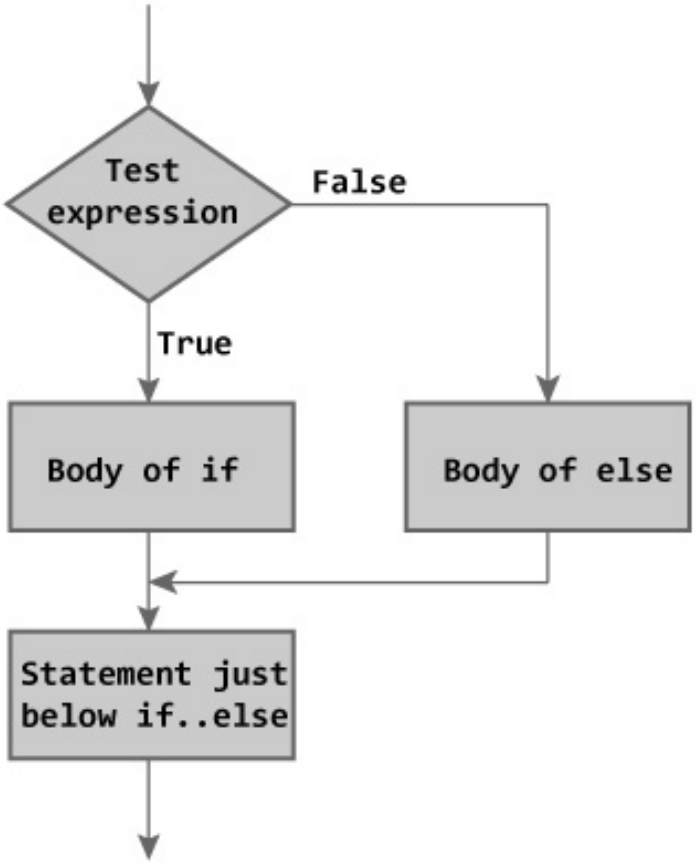

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- A condition is satisfied or true, if the relational operator, or equality is satisfied.
- For a = 3, and b = 5:
  - $a < b, a <= b$, and $a\ != b$ are **true**.
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- Expression can contain relational, logical or equality operators.

Relational	<= < > >=
Equality	== !=
Logical	&& ||

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

     char input;

     printf("Input a character:\t" );
     scanf ("%c", &input);

     if (input == 'W') {
        printf("Attendance is below 85 %%\n");
     }
     if (input == 'A') {
        printf("Marks between 90--100 %%\n");
     }
     if (input == 'B') {
        printf("Marks between 80--90 %% \n");
     }
     else {
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A correct program.

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Is this correct?

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Notice the variables W, A, B declared. What is the output of the program?

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Notice the variables W, A, B declared. What is the output of the program?

variable vs character constant

- if (input == W)
  - comparing a variable input with another variable W.
  - What is the value of the variable W?

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  - If W is a character and is initialized to W, you will have desired behaviour.

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  - If W is a character and is initialized to W, you will have desired behaviour.
- if (input == 'W')
  - comparing a variable input with character constant W.

- In C, we can define some variables to be constants as well.
  - const float PI = 3.14;
  - const int myConstant = 71289;
  - const char gradeW = 'W';
- Recall what are valid variables names.

Are the parenthesis needed?

Accept a character from {W, A, B} and output appropriate message.

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How is the nesting?

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if else: example2

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

     printf("Enter your marks: \t");
     scanf("%d", &marks);

     if (marks > 40)
        if (marks > 75)
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- No errors during compilation or execution.
- Does not produce desired behaviour.
- else pairs with the latest unpaired if.
- referred to as a "dangling else problem."

if else: example2 – correct program

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- Draw the control flow of the program.

if else: example2 – observe carefully

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- What is the output of the program on
  - 40, 50, 75, 85

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- What is the output of the program on
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- Note the semicolon if (marks $>$ 75);
- Semicolon is a statement terminator.