"Heaven's Light is Our Guide"

Department of Computer Science & Engineering

RAJSHAHI UNIVERSITY OF ENGINEERING & TECHNOLOGY

Programming in C

Lab Manual : 2

Selection Statements (if, if-else & switch) and Conditional Operator

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Lab Objectives:

- Explain the basic of different selection structures (if, if-else & switch structure)
- Design programs by using selection structure
- Explain the conditional operator

Background:

The if statement:

The if statement enables you to test for a condition (such as whether two variables are equal) and go to different parts of your code depending on the result of the condition.
The simplest form of an **if** statement is**:**

```
if (expression){
        statement/s;
}
```

The if-else statement:

Often your program will want to take one branch if your condition is true, another if it is false. In such cases **if-else** statement is used.
The simplest form of **if-else** statement is**:**

```
if (expression){
        statement/s;
}
else{
        statement/s;
}
```

If only one statement is to be followed by the **if or else** condition then there is no need of parenthesis.

The switch statement:

Switch is a built-in multiple branch selection statement in C programming language, which successively tests the value of an expression against a list of integer or character constants. When a match is found, the statements associated with that constant are executed. There must be break at the end of the statements of each case otherwise all the preceding cases will be executed including the default condition. The general form of the **switch** statement is**:**

```
switch (expression){
        case constant1: statement/s;
                        break;
        case constant2: statement/s;
                        break;
        .
```

```
        .
        .
        .
        .
        default: statement/s;
}
```

Conditional Operator:

The conditional operator (**?:**) is C's only ternary operator; that is, it is the only operator to take three operands.
The conditional operator takes three expressions and returns a value**:**

(expression1) **?** (expression2) **:** (expression3)
This line is read as "If expression1 is true, return the value of expression2; otherwise, return the value of expression3." Typically, this value would be assigned to a variable.

Look at the following if else structure**:**

```
if( a > b ){
        c = a;
}
else{
        c = b;
}
```

This if else structure can be replaced by
c = (a > b)**?** a **:** b

Some Examples:

1. Write a program that will read an integer and print whether it is odd or even.

Source code:

```
#include<stdio.h>
int main(){
        int num;
        printf("Enter any number: ");
        scanf("%d", & num);
        if(num%2==0){
                printf("\n %d is an Even number.\n",num);
        }
        else{
                printf("\n %d is an Odd number.\n",num);
        }
        return 0;
}
```

2. Write a program that will read obtained marks and display the result in division.

Source code:

```
#include<stdio.h>
int main(){
	int mark;
	printf(" Obtained Marks =  ");
	scanf("%d", &mark);
	if ( mark >= 60 )
		printf("\n --> First Division. \n ");
	else if( mark >= 45 )
		printf("\n --> Second Division. \n ");
	else if( mark >= 33 )
		printf("\n --> Third Division. \n ");
	else
		printf("\n --> Fail…\n ");
	return 0;
}
```

3. Write a program that will read obtained marks and display 'P' (for Pass) or 'F' (for Fail) using conditional operator.

Source code:

```
#include<stdio.h>
int main(){
	int mark;
	char passORfail;
	printf("Obtained Marks =  ");
	scanf("%d", &mark);
	passORfail = (mark>=40) ? 'P' : 'F';
	printf("\nDecision (P/F): %c \n", passORfail);
	return 0;
}
```

4. Write a program that will read a character and display whether it is vowel or not.

Source code:

```
#include<stdio.h>
int main(){
	char ch;
	printf("Enter a character:  ");
	scanf("%c",&ch);
```

```
    switch(ch){
        case 'a':
        case 'A':
        case 'e':
        case 'E':
        case 'i':
        case 'I':
        case 'o':
        case 'O':
        case 'u':
        case 'U':
            printf("\n %c is vowel\n",ch);
            break;
        default:
            printf("\n %c is not vowel\n",ch);
    }
    return 0;
}
```

Exercise:

1. **Write a program that will read two numbers and display the minimum using conditional operator.**
2. **Write a program that will read four numbers and display the maximum.**
3. **Write a program that will read two numbers and perform addition (+) / subtraction (-) / multiplication (*) / division (/) operation between them using switch statement.**

Sample Input: Enter two numbers**:** **10** **99** Operation to be performed (**+, -, *, /**)**:** *****	***Sample Input:*** Enter two numbers**:** **10** **9** Operation to be performed (**+, -, *, /**)**:** **+**
Sample Output: The Result = **990**	***Sample Output:*** The Result = **19**

4. **Write a program that will accept a number and check whether it is divisible by 5 or not.**
5. **Write a program that will accept a digit from user and display by spelling**.

Sample Input: Enter a digit**: 0** ***Sample Output:*** Spelling**: Zero**	***Sample Input:*** Enter a digit**: 7** ***Sample Output:*** Spelling**: Seven**