

**Batch: C1-2      Roll No.: 16010123036**

**Experiment / assignment / tutorial No. 2**

**Grade: AA / AB / BB / BC / CC / CD / DD**

**Signature of the Staff In-charge with date**

**TITLE:** a. Write a program to accept 3 numbers from the user and find the largest of the 3 numbers using  
If - else if-else  
Ternary operator  
b. Write a C program to find the grade of a student using switch case statements.

**AIM:** a. Write a program to accept 3 numbers from the user and find the largest of the 3 numbers using  
If - else if-else  
Ternary operator  
b. Write a C program to find the grade of a student using switch case statements.  
The below table shows the grading system.

Score in subject	Grade
$\geq 90$	A
80-89	B
70-79	C
60-69	D
50-59	E
$< 50$	F

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**Expected OUTCOME of Experiment:**

Apply basic concepts of C programming for problem solving.(CO1 and CO2).

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**Books/ Journals/ Websites referred:**

1. Programming in C, second edition, Pradeep Dey and Manas Ghosh, Oxford University Press.
2. Programming in ANSI C, fifth edition, E Balagurusamy, Tata McGraw Hill.
3. Introduction to programming and problem solving , G. Michael Schneider ,Wiley India edition.
4. <http://cse.iitkgp.ac.in/~rkumar/pds-vlab/>

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### Problem Definition:

1. Ask user to input three numbers. Compare three numbers to find the largest of them using
  - a. Nested if else statement
  - b. Using ternary operator
2. Write a C program to find the grade of a student using switch case statements. The below table shows the grading system.

Score in subject	Grade
$\geq 90$	A
80-89	B
70-79	C
60-69	D
50-59	E
$< 50$	F

### Algorithm:

#### Q1):

1. Start
2. Declare a , b , c .
3. Ask the user to enter three integer values.
4. Read the three integer values in a, b and c (integer variables).
5. Declare max.
6. Check if a is greater than b.
7. **If true**, then check if a is greater than c.

1. **If true**, then store a as max.
2. **If false**, then store b as max.
8. **If false**, then check if b is greater than c.
  1. **If true**, then store b as max.
  2. **If false**, then store c as max.
9. Print max.
10. End.

**Q2) :**

1. Start
2. Declare a variable 'marks'.
3. Ask the user to enter the marks between 0 to 100.
4. Read and store the entered marks in the variable 'marks'.
5. Check if marks are greater than 100.
  - a. If true, then
    1. Print "Please enter valid marks within the range 1-100".
  - b. If false, then
    1. Use a switch case based on the value of 'marks / 10'.
      - i. **Case** for scores 10 and 9:
        1. Print "Your Grade is: A".
      - ii. **Case** for score 8:
        1. Print "Your Grade is: B".
      - iii. **Case** for score 7:
        1. Print "Your Grade is: C".
      - iv. **Case** for score 6:

1. Print "Your Grade is: D".

v. **Case** for score 5:

1. Print "Your Grade is: E".

vi. **Default case:**

1. Print "Your Grade is: F or Fail".

6. End.

### Implementation Details:

**Q1)**

#### Using Nested if else if

```
1  #include<stdio.h>
2  int main()
3  {
4      int a,b,c;
5      printf("Name: Amandeep Singh\nRoll No: 16010123036\n");
6      printf("Enter Three Integers:\n");
7      scanf("%d %d %d",&a,&b,&c);
8      int max=0;
9      if(a>b)
10     {
11         if(a>c)
12             max=a;
13         else
14             max=c;
15     }
16     else
17     {
18         if(b>c)
19             max=b;
20         else
21             max=c;
22     }
23     printf("The maximum value is (using If -Else if-Else): %d\n",max);
24 }
```

**Using Ternary Operator:**

```
1  #include<stdio.h>
2  int main()
3  {
4      int a,b,c;
5      printf("Name: Amandeep Singh\nRoll No: 16010123036\n");
6      printf("Enter Three Integers: ");
7      scanf("%d %d %d",&a,&b,&c);
8      int max=(a>b)?((a>c)?a:c):((b>c)?b:c);
9      printf("The maximum value is (using Ternary): %d\n",max);
10
11 }
```

Q2)

```
1  #include<stdio.h>
2  #include<stdlib.h>
3  int main()
4  {
5      printf("Name: Amandeep Singh\nRoll No: 16010123036\n");
6      int marks;
7      printf("Enter The Marks Between 0 To 100:");
8      printf("\nEnter The Mark: ");
9      scanf("%d", &marks);
10     if(marks>100)
11     {
12         printf("Please enter valid marks within the range 1-100");
13     }
14     else
15     {
16         switch(marks/10)
17         {
18             case 10 :
19             case 9 :
20                 printf("Your Grade is: A");
21                 break;
22             case 8 :
23                 printf("Your Grade is: B" );
24                 break;
25             case 7 :
26                 printf("Your Grade is: C" );
27                 break;
28             case 6 :
29                 printf("Your Grade is: D" );
30                 break;
31             case 5 :
32                 printf("Your Grade is: E" );
33                 break;
34             default :
35                 printf("You Grade is: F or Fail\n");
36         }
37     }
38     return 0;
39 }
40
```

**Output(s):**

**Q1) a)**

```
Name: Amandeep Singh
Roll No: 16010123036
Enter Three Integers:
15 64 32
The maximum value is (using If -Else if-Else): 64
```

**b)**

```
Name: Amandeep Singh
Roll No: 16010123036
Enter Three Integers: 39 45 13
The maximum value is (using Ternary): 45
```

**Q2)**

```
Name: Amandeep Singh
Roll No: 16010123036
Enter The Marks Between 0 To 100:
Enter The Mark: 98
Your Grade is: A
```

```
Name: Amandeep Singh
Roll No: 16010123036
Enter The Marks Between 0 To 100:
Enter The Mark: 85
Your Grade is: B
```

```
Name: Amandeep Singh
Roll No: 16010123036
Enter The Marks Between 0 To 100:
Enter The Mark: 75
Your Grade is: C
```

```
Name: Amandeep Singh
Roll No: 16010123036
Enter The Marks Between 0 To 100:
Enter The Mark: 69
Your Grade is: D

Name: Amandeep Singh
Roll No: 16010123036
Enter The Marks Between 0 To 100:
Enter The Mark: 57
Your Grade is: E

Name: Amandeep Singh
Roll No: 16010123036
Enter The Marks Between 0 To 100:
Enter The Mark: 35
Your Grade is: F or Fail
```

### Conclusion:

This experiment aimed to reinforce basic C programming concepts, focusing on conditional statements and control structures. By implementing programs to find the largest of three numbers and determine a student's grade using switch case statements, students practiced essential skills in problem-solving (CO1 and CO2). The experiment provided practical experience in applying fundamental programming constructs, preparing students for more complex challenges in future coursework and applications.

### Post Lab Descriptive Questions

1. Virtual lab for switch statement

<https://cse02-iiith.vlabs.ac.in/exp/basic-control-flow/simulation.html>



Virtual Labs Basic Control Flow

**Initialize**

Select the Day :

☐ DAY : 1  
☐ DAY : 2  
☐ DAY : 3  
☒ DAY : 4  
☐ DAY : 5  
☐ DAY : 6  
☐ DAY : 7

DAY :

Submit Day Next

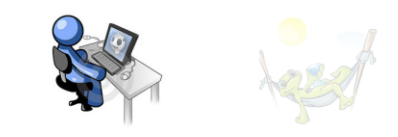
**Step Execution**

```

main() {
    char* str;
    str = null;
    switch (DAY) {
        case 1 : str = "Monday";
            break;
        case 2 : str = "Tuesday";
            break;
        case 3 : str = "Wednesday";
            break;
        case 4 : str = "Thursday";
            break;
        case 5 : str = "Friday";
            break;
        case 6 : str = "Saturday";
            break;
        case 7 : str = "Sunday";
            break;
        default : str = null;
            break;
    }
    if (strcmp(str, "Sunday") == 0) {
        printf("HOLIDAY");
    }
    else if (str != null) {
        printf("WORKING DAY");
    }
    else {
        printf("INVALID INPUT");
    }
}

```

**Code Output**



str : Friday

day : 5

output : WORKING DAY

23 January 2024

## 2. Virtual lab for if statement

<https://cse02-iiith.vlabs.ac.in/exp/basic-control-flow/simulation.html>

Virtual Labs Basic Control Flow

**Initialize**

x1 = 075; y1 = 075;  
 x2 = 275; y2 = 075;  
 x3 = 275; y3 = 325;  
 x4 = 075; y4 = 325;

X :

Y :

If else & code

Ok

Start Next

Local Variable :

flag = 1

x = 150 y = 150

**Step Execution**

```

void main() {
    int flag;
    if( X < x1 || X > x2 )
    {
        flag = 0;
    }
    else if( Y < y1 || Y > y4 )
    {
        flag = 0;
    }
    else
    {
        flag = 1;
    }
    if (flag == 1)
    {
        printf("INSIDE");
    }
    else
    {
        printf("OUTSIDE");
    }
}



```


**Code Output**



Output: INSIDE

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Basic Control Flow


**Initialize**

```


x1 = 075; y1 = 075;
x2 = 275; y2 = 075;
x3 = 275; y3 = 325;
x4 = 075; y4 = 325;

X : 
Y : 

# else-code
Ok
Start Next

Local Variable :
flag_1 = 1    flag_2 = 1
flag_3 = 1    flag_4 = 1
x = 150      y = 150


```


**Step Execution**

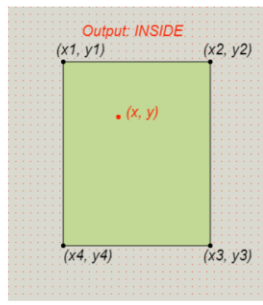
```

void main() {
  int flag_1, flag_2, flag_3, flag_4;
  flag_1 = flag_2 = flag_3 = flag_4 = 0;
  if ( X >= x1 )
  {
    flag_1 = 1;
  }
  if ( X <= x2 )
  {
    flag_2 = 1;
  }
  if ( Y >= y1 )
  {
    flag_3 = 1;
  }
  if ( Y <= y4 )
  {
    flag_4 = 1;
  }
  if ( flag_1 && flag_2 && flag_3 && flag_4 )
  {
    printf ( "INSIDE" );
  }
  else
  {
    printf ( "OUTSIDE" );
  }
}

```


**Code Output**

Output: **INSIDE**



No new notifications

Date: \_\_\_\_\_

Signature of faculty in-charge