Course Name:	**Programming in C**	**Semester:**	**II**
Date of Performance:	**20-01-2025**	**DIV/ Batch No:**	**C-5 (3)**
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Experiment No: 2
Title: Use of decision-making control structures

Aim and Objective of the Experiment:

Write a program in C to demonstrate the use of decision-making control structures

COs to be achieved:

CO2: Illustrate the use of control structures

Theory:

An if-else statement is a conditional statement that executes a different set of statements based on the condition that is true or false.

Syntax :

```
if (condition) {
    //code
}
else {
    //code
}
```

A switch statement is a conditional statement used to check the value of a variable and compare it with all the cases. If the value is matched with any case, then its corresponding statements will be executed.

Syntax :

```
switch (expression) {
   case value1:

      break;
   case value2:

      break;
```

```
    default:

}
```

Problem Statements:

Write a program for the following

1. The current year and the year the employee joined the organization are entered through the keyboard. Calculate the current month's salary by checking the years the employee served in the organization.
   Bonus is given to the employee in the below cases:

Year	bonus
0 to 3	1000
>= 3 to <6	2500
>=6 to <10	5000
>= 10	10000

2. Enter the marks of 5 subjects, find the average, and display a student's grade using switch case statements.

   The table below shows the grading system.

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

Code :

Question 1.]

```
#include<stdio.h>
int main()
{
   int current_yr, joined_yr, year , sal ;
   float gs;
   printf("Enter current year:");
   scanf("%d",&current_yr);
   printf("Enter year joined:");
   scanf("%d",&joined_yr);
   year=current_yr-joined_yr;
   printf ("Enter the salary: ");
   scanf ("%d" , &sal);
   if((year>=0)&&(year<3)){
     gs = sal+1000;
      printf( "Bonus is Rs. 1000 therefore gross salary is: %f" , gs);
   }
   else if((year>=3)&&(year<6))
   {
         gs = sal +2500;
          printf("Bonus is Rs. 2500 therefore gross salary is: %f" , gs);
   }
   else if((year>=6)&&(year<10))
   {
      gs = sal +5000;
      printf("Bonus is Rs. 5000 therefore gross salary is: %f" , gs);
   }
   else if(year>=10)
   {
      gs = sal + 10000;
       printf("Bonus is Rs. 10000 therefore gross salary is: %f" , gs);
   }
    return 0;
}
```

Question 2.]

```
#include <stdio.h>
int main()
 {
   int s1, s2, s3, s4, s5;
   float avg;
   printf("Enter marks in Math: ");
   scanf("%d", &s1);
   printf("Enter marks in English: ");
   scanf("%d", &s2);
   printf("Enter marks in Science: ");
   scanf("%d", &s3);
   printf("Enter marks in History: ");
   scanf("%d", &s4);
   printf("Enter marks in Geography: ");
   scanf("%d", &s5);
   avg = (s1 + s2 + s3 + s4 + s5) / 5.0;
   printf("Average marks: %.2f\n", avg);
   switch ((int)avg / 10) {
      case 10: // For perfect scores
      case 9:
         printf("Grade is A\n");
         break;
      case 8:
         printf("Grade is B\n");
         break;
      case 7:
         printf("Grade is C\n");
         break;
      case 6:
         printf("Grade is D\n");
         break;
      case 5:
         printf("Grade is E\n");
         break;
      default:
         printf("Grade is F\n");
   }
```

```
    return 0;
}
```

Output:

Question 1.]

```
Enter current year:2025
Enter year joined:2024
Enter the salary: 100000
Bonus is Rs. 1000 therefore gross salary is: 101000.000000
Process returned 0 (0x0)   execution time : 9.516 s
Press any key to continue.
```

Question 2.]

```
Enter marks in Math: 100
Enter marks in English: 85
Enter marks in Science: 95
Enter marks in History: 98
Enter marks in Geography: 96
Average marks: 94.80
Grade is A

Process returned 0 (0x0)   execution time : 7.373 s
Press any key to continue.
```

Post Lab Subjective/Objective type Questions:

1. Ask the user to input three numbers. Compare three numbers to find the largest of them using
   - Nested if else statement
   - Using ternary operator

Ans:

Nested If- else Statement

```c
#include <stdio.h>

int main() {
   int n1, n2, n3;
   printf("Enter the first number: ");
   scanf("%d", &n1);

   printf("Enter the second number: ");
   scanf("%d", &n2);
   printf("Enter the third number: ");
   scanf("%d", &n3);
   if (n1 >= n2) {
      if (n1 >= n3) {
         printf("The largest number is: %d\n", n1);
      } else {
         printf("The largest number is: %d\n", n3);
      }
   } else {
      if (n2 >= n3) {
         printf("The largest number is: %d\n", n2);
      } else {
         printf("The largest number is: %d\n", n3);
      }
   }

   return 0;
}
```

```
Enter the first number: 5
Enter the second number: 3
Enter the third number: 2
The largest number is: 5

Process returned 0 (0x0)   execution time : 2.702 s
Press any key to continue.
```

Ternary Operator

```c
#include <stdio.h>
int main() {
   int num1, num2, num3, largest;
```

```
    printf("Enter the first number: ");
    scanf("%d", &num1);
    printf("Enter the second number: ");
    scanf("%d", &num2);
    printf("Enter the third number: ");
    scanf("%d", &num3);
    largest = (num1 > num2)
            ? ((num1 > num3) ? num1 : num3)
            : ((num2 > num3) ? num2 : num3);
    printf("The largest number is: %d\n", largest);
    return 0;
}
```

```
Enter the first number: 5
Enter the second number: 3
Enter the third number: 2
The largest number is: 5

Process returned 0 (0x0)   execution time : 2.914 s
Press any key to continue.
```

2. Check the output of the following program:

```
main( )
{
char ch ;
printf ( "Enter any of the alphabet a, b, or c " ) ;
scanf ( "%c", &ch ) ;
switch ( ch ){
     case 'a' :
     case 'A' :
          printf ( "a as in ashar" ) ;
     break ;
     case 'b' :
     case 'B' :
          printf ( "b as in brain" ) ;
     break ;
     case 'c' :
```

```
        case 'C' :
             printf ( "c as in cookie" ) ;
        break ;
        default :
             printf ( "wish you knew what are alphabets" ) ;
}}
```

Ans:

```
Enter any of the alphabet a, b, or c: a
a as in ashar
Process returned 13 (0xD)   execution time : 2.610 s
Press any key to continue.
```

```
Enter any of the alphabet a, b, or c: b
b as in brain
Process returned 13 (0xD)   execution time : 2.156 s
Press any key to continue.
```

```
Enter any of the alphabet a, b, or c: c
c as in cookie
Process returned 14 (0xE)   execution time : 2.306 s
Press any key to continue.
```

Conclusion:

In this module I learnt the use of decision making control statements used in C programming. I learnt about various statements like if-else statements and switch case.
An if-else statement is a conditional statement that executes a different set of statements based on the condition that is true or false. If we have various conditions to check we can also use nested if statements.
A switch statement is a conditional statement used to check the value of a variable and compare it with all the cases. If the value is matched with any case, then its corresponding statements will be executed.

Signature of faculty in-charge with Date: