|  |  |  |  |
| --- | --- | --- | --- |
| **Course Name:** | **Programming in C** | **Semester:** | **II** |
| **Date of Performance:** | **17 / 01 / 2025** | **DIV/ Batch No:** | **C4-1** |
| **Student Name:** | **Dhruv Pankhania** | **Roll No:** | **16010124216** |

**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 |      1. 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 :** |
| **1.** #include<stdio.h>  int main(){  int currentYear, joinningYear, yearsServed, salary;  printf("Enter the year of joinning: ");  scanf("%d", &joinningYear);  printf("Enter the current year: ");  scanf("%d", &currentYear);  printf("Enter your salary: ");  scanf("%d", &salary);  yearsServed = currentYear - joinningYear;  if(yearsServed>=10){  printf("Your Salary is: %d", salary+10000);  }  else{  if(yearsServed<10 && yearsServed>=6){  printf("Your Salary is: %d", salary+5000);  }  else{  if(yearsServed<6 && yearsServed>=3){  printf("Your Salary is: %d", salary+2500);  }  else{  if(yearsServed<3){  printf("Your Salary is: %d", salary+1000);  }  }  }  }  return 0;  }  **2.** #include<stdio.h>  *int* main(){    printf("Enter Marks of 5 Subjects: ");  *int* sub1, sub2, sub3, sub4, sub5;    scanf("%d %d %d %d %d", &sub1, &sub2, &sub3, &sub4, &sub5);  *int* average = (sub1 + sub2 + sub3 + sub4 + sub5)/5;    switch (average/10){      case 10:      case 9:        printf("Grade: A");        break;      case 8:      printf("Grade: B");        break;      case 7:      printf("Grade: C");        break;      case 6:      printf("Grade: D");        break;      case 5:      printf("Grade: E");        break;      default:      printf("Grade: F");        break;    }    return 0;  } |
|  |

|  |
| --- |
| **Output:** |
| 1.    2. |

|  |
| --- |
| **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   #include<stdio.h>  *int* main(){  *int* a, b, c;  printf("Enter 3 numbers: ");  scanf("%d %d %d", &a, &b, &c);  printf("Using Nested if else statement \n");  if(a>b){    if(a>c){      printf("The largest Number is: %d \n", a);    }    else{      printf("The largest Number is: %d \n", c);    }  }  else{    if(b>c){      printf("The largest Number is: %d \n", b);    }  else{      printf("The largest Number is: %d \n", c);  }  }  printf("Using ternary operator \n");  (a>b)? ((a>c)? printf("The largest Number is: %d", a):printf("The largest Number is: %d", c)): ((b>c)? printf("The largest Number is: %d", b):printf("The largest Number is: %d", c));    return 0;  } |
| 1. 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" ) ;  }} |

|  |
| --- |
| **Conclusion:** |
| We learnt about the decision control structures in C, The **if-else statement** is one of the most fundamental constructs for decision-making. It allows us to compare two variables or expressions and execute a specific block of code based on whether the comparison evaluates to true or false.   However, when we need to compare more than two values or handle multiple conditions, the **nested if-else statement** comes into play. This involves placing one if-else statement inside another, enabling the program to make more complex decisions based on multiple layers of conditions. While effective, nested if-else statements can become cumbersome and harder to read as the complexity increases.  To address this challenge, C provides the **switch-case statement** as a more streamlined and readable alternative. The switch-case construct is designed to handle scenarios where we need to compare a variable or expression against multiple predefined cases. It is particularly advantageous because it eliminates the need for deeply nested structures and makes the code easier to write, understand, and maintain. |

|  |
| --- |
| **Signature of faculty in-charge with Date:** |