Session- 3 -C Programming on if , if-else and else if ladder statements

1. Write and execute C program to determine whether a character entered by user is alphabet, digit, punctuation and whitespace using simple if statement .

(**All punctuation characters** - ! " # $ % & ' ( ) * +, - . / : ; ? @ [\ ] ^ _ ` { | } ~)

```
// alphabet, digit, punctuation and whitespace
#include<stdio.h>
#include<ctype.h>
int main()
{
      char ch;

      printf(" Please Enter any character :  ");
      scanf("%c", &ch);

      if (isalpha(ch))
      {
            printf("\n %c is an Alphabet", ch);
      }
      if (isdigit(ch))
      {
            printf("\n %c is a Digit", ch);
      }
      if (ispunct(ch))
      {
            printf("\n %c is a Punctuation.", ch);
      }
      if (isspace(ch))
      {
            printf("\n %c is a space", ch);
      }

      printf("End of Program \n");
return 0;
}
```

2. Write and execute C program to read numbers using keyboard and find the roots of a quadratic equation using else-if statement and display the result.

```
//find the roots of a quadratic equation
#include<stdio.h>
#include<math.h>
  int main() {
        double a, b, c, discriminant, root1, root2, realPart, imagPart;
        printf("Enter coefficients a, b and c: ");
        scanf("%lf %lf %lf", &a, &b, &c);
        discriminant = b * b - 4 * a * c;

        if (discriminant > 0) {
            root1 = (-b + sqrt(discriminant)) / (2 * a);
            root2 = (-b - sqrt(discriminant)) / (2 * a);
            printf("root1 = %.2lf and root2 = %.2lf", root1, root2);
        }

        else if (discriminant == 0) {
            root1 = root2 = -b / (2 * a);
            printf("root1 = root2 = %.2lf;", root1);
        }

        else {
            realPart = -b / (2 * a);
            imagPart = sqrt(-discriminant) / (2 * a);
            printf("root1 = %.2lf+%.2lfi and root2 = %.2f-%.2fi",
realPart, imagPart, realPart, imagPart);
        }
        return 0;
    }
}
```

3. Write and execute a C program to read a year, check whether a given year is leap year or not using if-else statement and display the result.

```
// check whether a given year is leap year or not
#include <stdio.h>
int main() {
    int year;
    printf("Enter a year: ");
    scanf("%d", &year);
    if ( year % 400 == 0 ||year % 100!= 0 && year % 4 == 0)
      {
           printf("%d is a leap year.", year);

       }
     else
        printf("%d is not a leap year.", year);
    return 0;
}
```

4. Write and execute a C program to read marks for 6 subjects from keyboard and find grade of a student based on marks range using else-if ladder.

```
/#include<stdio.h>
      int main(){
      int m1, m2, m3, m4 ,m5, m6;
      float perc;

      printf("Enter your perc of 6 subjects between 0-100\n");
      scanf("%d%d%d%d%d%d",&m1,&m2,&m3,&m4,&m5,&m6);

      if(m1 < 40 || m2 < 40 ||m3 < 40 ||m4 < 40 ||m5 < 40 ||m6 < 40 )
      {
            printf(" Failed!! \n");
            exit(0);
      }
        else
      {
            perc=((m1+m2+m3+m4+m5+m6)/600)*100;

            if(perc >89)
            {
            printf("YOUR GRADE : S\n");
            }
            else if (perc > 74 && perc <=89)
            {
            printf("YOUR GRADE : A\n");
            }
            else if (perc >59 && perc <= 74)
            {
            printf("YOUR GRADE : B\n");
            }
            else if (perc >49 && perc <=59)
            {
            printf("YOUR GRADE : C\n");
            }
            else if (perc > 39 && perc <=49)
            {
            printf("YOUR GRADE : C\n");
            }
            else
            {
            printf("YOUR GRADE : Failed\n");
            }
      }
      return(0);

}
```

5. Write and execute a C program to read three values using keyboard, check whether the triangle is isosceles, equilateral or scalene using if-else statement and display the result.

```
#include <stdio.h>

int main()
{
      int side1, side2, side3;
      printf("Enter three sides of triangle: ");
      scanf("%d%d%d", &side1, &side2, &side3);

       if(side1==side2 && side2==side3)
       {
          printf("Equilateral triangle.");
       }
       else if(side1==side2 || side1==side3 || side2==side3)
       {
        printf("Isosceles triangle.");
       }
       else
        {
          printf("Scalene triangle.");
        }

return 0;
}
```

Additional Programs

1. Write and execute a C program to read a numbers and print its equivalent octal and hexadecimal numbers.
2. Write and execute a C program to find the smallest of three numbers.
3. Write and execute a C program to illustrate the use of typedef declaration in a program.
4. Write and execute a C program to find the greatest of three numbers using nested if statement.
5. Write and execute a C program to check whether a given number is positive, negative or zero using if – else statement.
6. Write and execute a C program to check whether the entered number is odd or even using if-else statement.