ASSIGNMENT 4

1. Check whether a character is vowel or consonant (using if else)

```
#include<stdio.h>
int main()
{
char ch;
printf("enter the character: ");
scanf("%c",&ch);
if((ch=='a'||ch=='A'||ch=='e'||ch=='E'||ch=='i'||ch=='I'||ch=='o'||ch=='O'||ch=='u'||ch=='U'))
{
printf("given character is vowel");
}
else
{
printf("given character is consonant");
}
return 0;
}
```

Output:-

```
enter the character: w
given character is consonant
```

---

2. Find roots of a quadratic equation(using else if ladder)

```
#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;
}
```

Output:-

```
Enter coefficients a, b and c: 5
5.6
7
root1 = -0.56+1.04i and root2 = -0.56-1.04i
```

---

3. Check leap year(using if else)

```
#include <stdio.h>
int main()
{
  int year;
  printf("enter the year:");
  scanf("%d",&year);
  if((year%400==0)||(year%4==0)&&(year%100!=0))
  printf("leap year");
  else
  printf("not a leap year");
     return 0;
}
```

Output:-

```
enter the year:2020
leap year
```

---

4. CHECK WHICH NUMBER NEAREST TO THE VALUE 100 AMOUNG TWO GIVEN INTEGERS.RETURN 0 IF THE TWO NUMBERS ARE EQUAL.(USING NESTED IF…ELSE)

```
#include <stdio.h>

int main()
{

int a,b,var1,var2;
printf("enter two numbers:");
scanf("%d%d",&a,&b);
var1=100-a;
var2=100-b;
if(var1<=var2){
  if(var1==var2){
     printf("return 0");
  }
   else
{
      printf("a is nearest");

   }
   }
   else{
      printf("b is nearest");
   }
   return 0;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
enter two numbers:45
56
b is nearest
```

---

5. CHECK THREE GIVEN INTEGERS(SMALL,MEDIUM AND LARGE)AND RETURN TRUE IF THE DIFFERENCE BETWEEN SMALL AND MIDIUM AND THE DIFFERENCE BETWEEN MEDIUM AND LARGE IS SAME.(USING NESTED IF ELSE)

```
#include <stdio.h>
int main()
{
int small,medium,large;
printf("enter three numbers:");
```

```
scanf("%d%d%d",&small,&medium,&large);
if(small<medium&&medium<large){
   if(medium-small==large-medium){
      printf("return true");
   }else{
      printf("difference between them is equal");
   }
   }
  else{
     printf("three numbers are may or may not equal");
  }
 return 0;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
enter three numbers:45
45
67
three numbers are may or may not equal
```

---

6. CALCULATE AND PRINT THE ELECTRICITY BILL OF GIVEN CUSTOMER.THE CUSTOMER ID,NAME AND UNIT CONSUMED BY THE USER SHOULD BE TAKEN FROM THE KEYBOARD AND DISPLAY THE TOTAL AMOUNT TO PAY TO THE CUSTOMER.THE CHARGE ARE AS FOLLOWS:

UNIT	CHARGE/UNIT
UPTO 199	@1.20
200 AND ABOVE BUT LESS THAN 400	@1.50
400 AND ABOVE BUT LESS THAN 600	@1.80
600 AND ABOVE	@2.00

IF BILL EXCEEDS RS.400 THEN A SURCHANGE OF 15% WILL BE CHARGED AND MINIMUM BILL SHOULD BE OF RS 100/-(USING ELSE IF LADDER)

```
#include <stdio.h>
int main()
{
char name;
int id,unit;
float bill;
float u1=1.20,u2=1.50,u3=1.80,u4=2.00,sc=0.15;
printf("enter customer name:");
scanf("%s",&name);
printf("enter customer id:");
scanf("%ld",&id);
printf("customer consumed unit:");
scanf("%d",&unit);
if(unit<=199){
bill=unit*u1;
}else if(unit>=200&&unit<=400){
   bill=unit*u2;
}else if(unit>=400&&unit<=600){
   bill=unit*u3;
}else if(unit>=600){
   bill=unit*u4;
}
if(bill>400){
   bill=bill+(bill*sc);
}
```

```
if(bill<100){
   bill=100;
}
printf("your unit is %d and bill is %g",unit,bill);
   return 0;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
enter customer name:neha
enter customer id:1234
customer consumed unit:34
your unit is 34 and bill is 100
```

---

7. THE MARK OBTAINED BY A STUDENT IN 3 DIFFERENT SUBJECTS ARE INPUT BY USERS.YOUR PROGRAM SHOULD CALCULATE THE AVERAGE OF SUBJECTS.THE STUDENT GETS A GRADE AS PER THE FOLLOWING RULES(USING ELSE IF LADDER)

AVERAGE	GRADE
90-100	A
80-89	B
70-79	C
60-69	D

0-59	**F**

```
#include <stdio.h>
int main()
{
int m1,m2,m3,total,average;
printf("enter mark1 mark2 mark3: ");
scanf("%d%d%d",&m1,&m2,&m3);
total=m1+m2+m3;
printf("total secured mark is:%d\n",total);
average=total/3;
printf("avg mark is:%d\n",average);
if(average>=90&&average<=100){
printf("secured A grade");
}else if(average>=80&&average<=89){
  printf("secured B grade") ;
}else if(average>=70&&average<=79){
    printf("secured c grade");
}else if(average>=60&&average<=69){
    printf("secured D grade");
}else{
    printf("secured F grade");
}
    return 0;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
enter mark1 mark2 mark3: 89
90
90
total secured mark is:269
avg mark is:89
secured B grade
```

---

8. Print total number of days in a month (using switch case)

```
#include <stdio.h>
```

```
int main()
{
int month;
printf("enter the month: ");
scanf("%d",&month);
switch(month)
{
   case 1:
   printf("31 days");
   break;
   case 2:
   printf("28/29 days");
   break;
   case 3:
   printf("31 days");
   break;
   case 4:
   printf("30 days");
   break;
   case 5:
   printf("31 days");
   break;
   case 6:
   printf("30 days");
   break;
   case 7:
   printf("31 days");
   break;
   case 8:
   printf("31 days");
   break;
   case 9:
   printf("30 days");
   break;
   case 10:
   printf("31 days");
   break;
   case 11:
   printf("30 days");
   break;
   case 12:
   printf("31 days");
```

```
    break;
    default:
    printf("invalid entry...");
    break;

}
return 0;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
enter the month: 3
31 days
```

9. Create simple calculator using switch case.

```
#include <stdio.h>
int main()
{
int a,b,addition,subtract,divide,multi;
char operator;
printf("Enter operator:");
scanf ("%c",&operator);
printf("Enter Number1 : ");
scanf("%d",&a);
printf("Enter Number2 : ");
scanf("%d",&b);
switch(operator){
case'+':
    addition=a+b;
    printf("Addition is:%d",addition);
     break;
case '-':
    subtract= a-b;
    printf("Substraction is:%d",subtract);
break;
case '/':
    divide=(a/b);
    printf("division is:%d",divide);
break;
case '*':
    multi=(a*b);
    printf("multiplication is:%d",multi);
break;
```

```
default :
printf("invalid operator");
}
 return 0;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
Enter operator:-
Enter Number1 : 5
Enter Number2 : 7
Substraction is:-2
```

---

10. **PROMPTS THE USER TO ENTER GRADE.YOUR PROGRAM SHOULD DISPLAY THE CORRESPONDING MEANING OF GRADE AS PER THE FOLLOWING TABLE(USING SWITCH CASE)**

GRADE	MEANING
A	EXCELLENT
B	GOOD
C	AVERAGE
D	DEFICIENT
F	FAILING

```
#include <stdio.h>
int main()
{
   char grade;
   printf(" Enter the grade : ");
   scanf("%c",&grade);
   switch (grade)
   {
      case 'A':
      printf("Excellent");
      break;
      case 'B':
      printf("Good");
```

```
        break;
       case 'C':
       printf("Average");
        break;
        case 'D':
        printf("Deficient");
        break;
        case 'F':
        printf("Failing");
        break;
   }

 return 0;
}
```

Output:-

/tmp/oJ4WIg5EVE.o

Enter the grade : B

Good

OPTIONAL QUESTIONS

11. CHECK WHETHER A TRIANGLE IS EQUILATERAL,ISOSCELES,SCALENE.

```
#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;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
Enter three sides of triangle: 7
9
7
Isosceles triangle
```

---

12. Check whether a number is even or odd.

```
#include <stdio.h>
int main()
{
  int num;
  printf("enter the number: ");
  scanf("%d",&num);
  if(num%2==0)
  {
     printf("%d is even number",num);
  }
  else
  {
     printf("%d is odd number",num);
  }
  return 0;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
enter the number: 8
8 is even number
```

---

13. Check whether a character is alphabet or not.

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

```
   if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z'))
      printf("is an alphabet");
   else
      printf("is not an alphabet");

 return 0;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
Enter a character: j
is an alphabet
```

---

14. Find the largest number among three numbers.

```
#include <stdio.h>
int main()
{
 int num1,num2,num3;
 printf("enter three numbers: ");
 scanf("%d%d%d",&num1,&num2,&num3);
 if(num1>num2)
 if(num1>num3)
 printf("num1 is greater");
 else
 printf("num3 is greater");
 if(num2>num3)
 printf("num2 is greater");
 else
 printf("num3 is greater");

 return 0;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
enter three numbers: 34
78
56
num2 is greater
```

12.Read temperature in centigrade and display a suitable message according to temperature state below :

Temp < 0 then Freezing weather
Temp 0-10 then Very Cold weather
Temp 10-20 then Cold weather
Temp 20-30 then Normal in Temp
Temp 30-40 then Its Hot
Temp >=40 then Its Very Hot

```
#include <stdio.h>

void main()

{

    int temp;



   printf("enter the temperature : ");

   scanf("%d",&temp);

  if(temp<0)

         printf("Freezing weather");

  else if(temp<10)

        printf("Very cold weather");

        else if(temp<20)

              printf("Cold weather");

            else if(temp<30)

                  printf("Normal in temp");

                else if(temp<40)

                      printf("Its Hot");

                    else

                        printf("Its very hot");



}
```

Output:-

/tmp/oJ4WIg5EVE.o

enter the temperature : 67

Its very hot

---

18. Check whether a number is positive,negative or zero using switch case.

```
#include <stdio.h>

int main()
{
   int num;

   printf("Enter any number: ");
   scanf("%d", &num);

   switch (num > 0)
   {

      case 1:
         printf("%d is positive.", num);
      break;


      case 0:
         switch (num < 0)
         {
            case 1:
               printf("%d is negative.", num);
               break;
            case 0:
               printf("%d is zero.", num);
               break;
         }
      break;
   }

   return 0;
}
```

Output:-

```
/tmp/oJ4WIg5EVE.o
```

Enter any number: -12
-12 is negative.

---

19. Print day of week name using switch case.

```
#include<stdio.h>
int main()
{
 int num;
 printf("Enter day number: ");
 scanf("%d",&num);
 switch(num)
 {
  case 1:
   printf("\n Sunday");
   break;
  case 2:
   printf("\n Monday");
   break;
  case 3:
   printf("\n Tuesday");
   break;
  case 4:
   printf("\n Wednesday");
   break;
  case 5:
   printf("\n Thursday");
   break;
  case 6:
   printf("\n Friday");
   break;
  case 7:
   printf("\n Saturday");
   break;
  default:
   printf("\n invalid entry");
   break;
 }
 return 0;
}
```

Output:-

/tmp/oJ4WIg5EVE.o

```
Enter day number: 6

 Friday
```

---

20. Find roots of a quadratic equation using switch case.

```
#include <stdio.h>
#include <math.h>

int main()
{
   float a, b, c;
   float root1, root2, imaginary;
   float discriminant;

   printf("Enter values of a, b, c: ");
   scanf("%f%f%f", &a, &b, &c);

   discriminant = (b * b) - (4 * a * c);

   switch(discriminant > 0)
   {
      case 1:
         root1 = (-b + sqrt(discriminant)) / (2 * a);
         root2 = (-b - sqrt(discriminant)) / (2 * a);

         printf("Two  real roots exists: %.2f and %.2f",
               root1, root2);
```

```
            break;


        case 0:
            switch(discriminant < 0)
            {
                case 1:
                    root1 = root2 = -b / (2 * a);
                    imaginary = sqrt(-discriminant) / (2 * a);


                    printf("Two complex roots exists: %.2f + i%.2f and %.2f - i%.2f",
                          root1, imaginary, root2, imaginary);
                    break;


                case 0:
                    root1 = root2 = -b / (2 * a);


                    printf("Two equal and real roots exists: %.2f and %.2f", root1, root2);


                    break;
            }
    }


    return 0;
}
```

Output:-

/tmp/oJ4WIg5EVE.o

Enter values of a, b, c: 6

7

-9

Two distinct and real roots exists: 0.77 and -1.94