1. Check Whether a Character is a Vowel or Consonant (Using if)

```c
#include<stdio.h>
int main()
{
    char c;
    int lower_vowel,upper_vowel;
    printf("enter an alphabet:");
    scanf("%c", &c);

    lower_vowel=(c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u');
    upper_vowel=(c == 'A' || c == 'E' || c== 'I' || c== 'O' || c == 'U');

if( lower_vowel || upper_vowel )
     {
     printf("\n %c is a vowel", c);
     }

     if (  !lower_vowel &&! upper_vowel )
     {
          printf("\n %c is a consonent",c);
     }
  return 0;

}
```

Output:-

enter an alphabet:a

a is a vowel

enter an alphabet:n

n is a consonant

2. Find Roots of a Quadratic Equation (Using else if ladder)

```c
#include<math.h>
#include<stdio.h>
int main()
{
    double a,b,c,discriminant,root1,root2,imaginary_value,realpart;
    printf("enter coefficients of a,b,c\n");
    scanf("%lf %lf %lf",&a,&b,&c);

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

    //if the discriminant>0

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

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

    //if the dicriminant<0

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

    return 0;
}
```

Output:-

enter coefficients of a,b,c

25

25

36

root1 = 0.50+1.09i and root2 = 0.50-1.09i

3. Check Leap Year (Using if..else)

```c
#include <stdio.h>
int main()
{
   int year;
   printf("enter your year:");
   scanf("%d",&year);

   if (year%4==0 && year%100!=0 || year%400==0)
   {
      printf("%d is a leap year", year);
   }
   else
   {
      printf("%d is not a leap year", year);
   }
   return 0;
}
```

Output:-

enter your year:2012

2012 is a leap year

enter your year:2013

2013 is not a leap year

6.Calculate and print the Electricity bill of a 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 follow : 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 surcharge of 15% will be charged and the minimum bill should be of Rs. 100/- (Using else if ladder)

```c
#include <stdio.h>
#include <string.h>
int  main()
{
   int custid,unit_consumed,min_bill_amt;
   float charge, bill_amt,surcharge=0,fine;
   char name[30];


   printf("enter custid :");
   scanf("%d",&custid);

    printf("enter the name of the customer :");
   scanf("%s",name);

   printf("unit consumed:");
   scanf("%d",&unit_consumed);

   if (unit_consumed <200 )
   {
    charge = 1.20;
   }
   else if (unit_consumed>=200 && unit_consumed<400)
    {
        charge = 1.50;
    }
    else if (unit_consumed>=400 && unit_consumed<600)
    {
            charge = 1.80;
    }
    else
    {

           charge = 2.00;
    }
    bill_amt = unit_consumed*charge;
    if(bill_amt>400)
   {
     surcharge=bill_amt*15/100.0;
     fine=bill_amt+surcharge;

   }
```

```
   {
    if (fine<100)
       min_bill_amt=100;
   }

   printf("\n\n Electric Bill receipt\n\n");

   printf("CUSTOMER ID=%d\n",custid);
   printf("CUSTOMER NAME=%s\n",name);
   printf("UNIT CONSUMED=%.2f\n",charge,unit_consumed);
   printf("BILL TO BE PAID=%.2f\n",bill_amt);
   printf("SURCHARGE AMOUNT:%.2f\n",surcharge);
   printf("Total BILL TO BE PAID=%.2f\n",fine);
   return 0;
}
```

Output:-

enter custid :23

enter the name of the customer :koustav

unit consumed:800

Electric Bill receipt

CUSTOMER ID=23

CUSTOMER NAME=koustav

UNIT CONSUMED=2.00

BILL TO BE PAID=1600.00

SURCHARGE AMOUNT:240.00

Total BILL TO BE PAID=1840.00

7. The marks obtained by a student in 3 different subjects are input by the user. 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

```c
#include<stdio.h>
int main()
{
    float mark1,mark2,mark3,average;
    printf("enter marks obtained in 3 subjects are:\n");
    scanf("%f %f %f",&mark1,&mark2,&mark3);

    average=(mark1+mark2+mark3)/3;
    printf("the average of 3 subjects are %f\n",average);

/*90-100 A
  80-89 B
  70-79 C
  60-69 D
  0-59 F */

  if(average>=90)
  {
      printf("your grade is A");
  }
  else if(average>=80)
  {
      printf("your grade is B");
  }
  else if(average>=70)
  {
      printf("your grade is C");
  }
  else if(average>60)
  {
      printf("your grade is D");
  }
  else
  {
      printf("you are fail");
  }
    return 0;
}
```

Output:-

enter marks obtained in 3 subjects are:

25

36

45

the average of 3 subjects are 35.333332

you are fail

enter marks obtained in 3 subjects are:

90

95

97

the average of 3 subjects are 94.000000

your grade is A

8. print total number of days in a month using switch case.

```c
#include<stdio.h>
int main()
{
    int month;
    printf("enter month of a year:");
    scanf("%d",&month);
/*January - 31 days
February - 28 days in a common year and 29 days in leap years
March - 31 days
April - 30 days
May - 31 days
June - 30 days
July - 31 days
August - 31 days
September - 30 days
October - 31 days
November - 30 days
December - 31 days*/

    switch (month)
    {
         case 1:
        printf("january:31 days");
        break;

        case 2:
        printf("february:28/29 days");
        break;

        case 3:
        printf("march:31 days");
        break;

        case 4:
        printf("april:30 days");
        break;

        case 5:
        printf("may:31 days");
        break;

        case 6:
        printf("june:30 days");
        break;
```

```
        case 7:
        printf("july:31 days");
        break;

        case 8:
        printf("august:30 days");
        break;

        case 9:
        printf("september:30 days");
        break;

        case 10:
        printf("october:310days");
        break;

        case 11:
        printf("november:30 days");
        break;

        case 12:
        printf("december:31 days");
        break;

        default:
        printf("enter a month between 1 to 12");
        break;
    }

   return 0;

    }
```

Output:-

enter month of a year:15

enter a month between 1 to 12

enter month of a year:11

november:30 days

9. create Simple Calculator using switch case.

```c
#include<stdio.h>
int main()
{
    char operator;
    double num1,num2;

    printf("enter an operator(+,-,*,/):\n");
    scanf("%c",&operator);

    printf("enter two operands:\n");
    scanf("%lf %lf",&num1,&num2);

    switch(operator)
    {
        case'+':
        printf("%lf+%lf=%lf",num1,num2,num1+num2);
        break;

        case'-':
        printf("%lf-%lf=%lf",num1,num2,num1-num2);
        break;

        case'*':
        printf("%lf*%lf=%lf",num1,num2,num1*num2);
        break;

        case'/':
        printf("%lf/%lf=%lf",num1,num2,num1/num2);
        break;

        default:
        printf("you have entered an wrong operator");
        break;
    }
    return 0;
}
```

Output:-

enter an operator(+,-,*,/):

*

enter two operands:20

10

20.000000*10.000000=200.000000

10. Prompts the user to enter grade. Your program should display the corresponding meaning of grade as per the following table (Using Switch Case) GradeMeaning A Excellent B Good C Average D Deficient F Failing

```c
#include<stdio.h>
int main()
{
    char grade;
    printf("enter grade:");
    scanf("%c",&grade);
 /*
A Excellent
B Good
C Average
D Deficient
F Failing */

    switch(grade)
    {
        case 'A':
        printf("your garde is excellent\n");
        break;

        case 'B':
        printf("your grade is good\n");
        break;

        case 'C':
        printf("your grade is average\n");
        break;

        case 'D':
        printf("your grade is deficient\n");
        break;

        case 'F':
        printf("your grade is failing\n");
        break;

        default:
        printf("you have not appeared your exam");
        break;
    }

    return 0;
}
```

Output:-

enter grade:B

your grade is good

enter grade:c

you have not appeared your exam