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

```
#include<stdio.h>
int main()
{
        char x;
      int flag=0;
      printf("Enter the character : ");
      scanf("%c",& x);
      if(x=='a' || x=='A')
      {
      flag=1;
      printf("You entered vowel");
      }
      if(x=='e' || x=='E')
      {
      flag=1;
      printf("You entered vowel");
      }
      if(x=='i' || x=='I')
      {
      flag=1;
      printf("You entered vowel");
      }
      if(x=='o' || x=='O')
      {
      flag=1;
      printf("You entered vowel");
      }
      if(x=='u' || x=='U')
      {
      flag=1;
      printf("You entered vowel");
      }


      if(flag==0)
      printf("You entered consonant ");

      return 0;
}
```

Output:
Enter the character : i
You entered vowel

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

```
#include <stdio.h>
#include <math.h>
int main()
        {
        float a,b,c,r1,r2,d,img;
        printf("Enter the value of a : ");
        scanf("%f",&a);
        printf("Enter the value of b : ");
        scanf("%f",&b);
        printf("Enter the value of c : ");
        scanf("%f",&c);
        d=(b*b)-4*a*c;
        if (d>0)
        {
        r1= (-b+ sqrt (d))/ 2*a ;
        r2=(-b- sqrt (d))/ 2*a ;
        printf("Quadratic equation has two roots \n");
        printf("two roots are r1=%g & r2= %g ",r1,r2);
        }
        else if(d==0)
        {
                r1=r2=(-b/2*a);
                printf("two roots are equal\n");
                printf("r1= %g & r2= %g",r1,r2);
        }
        else if (d<0)
      {
          r1=r2=(-b/2*a);
          img= sqrt(-d)/2*a;
          printf("two roots are imaginary= %g \n",img);
          }
     return 0;
}
```

Output:

```
Enter the value of a : 5
Enter the value of b : 7
```

Enter the value of c : -9
Quadratic equation has two roots
two roots are r1=27.8365& r2= -69.8365

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

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

int main()
{
        int x;
        printf("Enter the year to check leap year :");
        scanf("%d",&x);
      if(x%4==0)
      {
      printf("leap year");
      }
      else
      {
        printf("not leap year");
      }
       return 0;
}
```

Output:
Enter the year to check leap year :2015
not leap year

4. Check which number nearest to the value 100 among two given integers. Return 0 if the two numbers are equal. (Using nested if…else)

```
#include <stdio.h>
int main()
  {
    int a,b,d1,d2;
        printf("enter a: " );
        scanf("%d",&a);
        printf("enter b: " );
        scanf("%d",&b);
          d1=100-a;
          d2=100-b;

        if(d1<=d2)
  {
        if(d1==d2)
  {
    printf(" %d is equal to %d”,a,b);
  }

  else
  {
    printf("%d is nearest to 100.",a);
  }

    else
  {
    printf("b %d is nearest to 100.",b);
  }
  }
    return 0;
}
```

Output:

```
enter a: 78
enter b: 94
```

b 94 is nearest to 100.

5. Check three given integers (small, medium and large) and return true if the difference between small and medium and the difference between medium and large is same. (Using nested if…else)

```
#include <stdio.h>

int main()
    {
        int s,m,l;
        printf("enter 1st no : ");
        scanf("%d",&s);
        printf("enter 2nd no : ");
        scanf("%d",&m);
        printf("enter 3rd no : ");
        scanf("%d",&l);

        if ((s<m&&m<l)||(m<s&&s<l)||(l<m&&m<s)||(l<s&&s<m)||(m<l&&l<s))
        {
                if((m-s==l-m)||(s-m==l-s)||(m-l==s-m)||(s-l==m-s)||(l-m==s-l))
                {
                        printf("Difference in between small and medium and medium and large
is same.");
                }
        else
        {
```

```
                printf("Difference in between small and medium and medium and large is
not same.");
                        }
    }
                        else
                    {
                        printf("all the entered no are same ");
                    }
      return 0;
      }
```

Output:

```
enter 1st no : 8
enter 2nd no : 12
enter 3rd no : 16
Difference in between small and medium     and medium and large is same.
```

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)

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

int main()
```

```
{
      char name[10];
      int id;
        int unit;
        float bill;
        float c1=1.20,c2=1.50,c3=1.80,c4=2.00,sc=0.15;
        printf("Enter Customer Name : ");
        scanf("%s",&name);
        printf("Enter Customer id : ");
        scanf("%d",&id);

        printf("Enter the electricity units : ");
        scanf("%d",&unit);
        if (unit<=199)
        {
        bill=unit*c1;
        }
        else if (unit>=200&&unit<400)
        {
          bill=unit*c2;
          }
        else if (unit>=400&&unit<600)
        {
        bill= 400*c3;
        }
        else if (unit>=600)
        {
        bill=600*c4;
        }
          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:

```
Enter Customer Name : ram
Enter Customer id : 201
Enter the electricity units : 300
Your unit is 300. and bill is 517.5.
```

7. The marks obtained by a student in 3 different subjects are input by the user. Your program should calculate the average of subjects. (Using else if ladder)

```
#include <stdio.h>
int main()
      {
        float m1,m2,m3,total;
        float avg;
        printf("Enter mark1 : ");
        scanf("%f",&m1);
        printf("Enter mark2 : ");
        scanf("%f",&m2);
        printf("Enter mark3 : ");
        scanf("%f",&m3);
        total= (m1+m2+m3);
```

```
        printf("Total marks obtained is : %g \n",total);
        avg=(total/3);
        printf("average mark is : %g\n",avg);
        if (avg>=90&&avg<100)
            {
                printf("secured \"A\" grade");
        }
      else if (avg>=80&&avg<90) {
              printf("secured \"B\" grade");
      }
        else if (avg>=70&&avg<80)
      {
                printf("secured \"C\" grade");
        }
      else if (avg>=60&&avg<70)
      {
      printf("secured \"D\" grade");
        }
      else if (avg>=0&&avg<60) {
                printf("secured \"F\" grade");
        }
        return 0;
}
```

Output:

```
Enter mark1 : 77.5
Enter mark2 : 82.9
Enter mark3 : 93.2
Total marks obtained is : 253.6
average mark is : 84.5333
secured "B" grade
```

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

```
#include <stdio.h>

int main()
{
        int month;

        printf("Enter month number(1-12): ");
       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 input! Please enter month number between 1-12");
           }
        return 0;
        }
```

Output:

```
Enter month number(1-12): 6
30 days
```

9. Create Simple Calculator using switch case

```
#include <stdio.h>
int main()
{
        char operator;
        double a, b;
        printf("Enter an operator (+, -, *,/): ");
        scanf("%c", &operator);
        printf("Enter two operands: ");
```

```
        scanf("%lf %lf", &a, &b);

        switch (operator)
    {
        case '+':
                printf("%.1lf + %.1lf = %.1lf", a, b, a + b);
                break;
        case '-':
                printf("%.1lf - %.1lf = %.1lf", a, b, a - b);
                break;
        case '*':
                printf("%.1lf * %.1lf = %.1lf", a, b, a * b);
                break;
        case '/':
                printf("%.1lf / %.1lf = %.1lf", a, b, a / b);
                break;
       default:
                printf("Error! operator is not correct");
        }

        return 0;
}
```

Output:

```
Enter an operator (+, -, *,/): +
Enter two operands: 7.5,8.3
7.5+8.3=15.8
```

10. Prompts the user to enter grade. Your program should display the corresponding (Using Switch Case)

```
#include <stdio.h>

int main()
{
   char g;
```

```
        printf(" Enter Grade : ");
        scanf("%c",&g);
        switch (g)
        {
                case 'a':
                case 'A':
                printf("Excellent");
                break;
                case 'b':
                case 'B':
                printf("Good");
                  break;
                case 'c':
                case 'C':
                printf("Average");
                break;
                case 'd':
                case 'D':
                printf("Deficient");
                break;
                case 'f':
                case 'F':
                printf(" Failing");
                  break;
                default :
                printf("Wrong Grade!!!");
        }
        return 0;
}
```

Output:

Please Enter Grade : D

Deficient