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

```
#include<stdio.h>

int main(){
   char c;

   printf("Enter a character :: ");
   scanf("%c",&c);

   if(c == 'a' || c == 'A' || c == 'e' || c == 'E' || c == 'i' || c == 'I' || c == 'o' || c == 'O' || c == 
'u' || c == 'U'){

      printf(" %c is Vowel",c);
   }
   else{
      printf(" %c is Consonant",c);
   }

   return 0;
}
```

Output:

```
Enter a character :: a
a is Vowel

Enter a character :: A
 A is Vowel

Enter a character :: g
 g is Consonant
```

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

```
#include <stdio.h>

int main(){

int b,a,c,D;

printf("Enter the value of a b c :: ");
scanf("%d%d%d",&a,&b,&c);

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

if(D > 0){
   printf("D = %d The roots are real and different.",D);
}
else if(D == 0){
   printf("D = %d The roots are real and equal.",D);
}
else if(D < 0){
   printf("D = %d The roots are complex and different.",D);
}
   return 0;
}
```

Output:

```
Enter the value of a b c :: 2
4
6
D = -32 The roots are complex and different.
```

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

```
#include <stdio.h>

int main(){

int year;

printf("Input a year :: ");

scanf("%d",&year);

if(year % 4 == 0){

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

Output:

```
Input a year :: 2021
2021 is not a leap year.

Input a year :: 2020
 2020 is a 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 num1,num2,res1,res2;

printf("Enter First Number :: ");
scanf("%d",&num1);

printf("Enter Second Number :: ");
scanf("%d",&num2);

if(num1 == num2){
return 0;

}

if(num1 < 100 && num2 < 100){
   res1 = 100 - num1;
   res2 = 100 - num2;
   if(res1 > res2){
      printf("%d is nearest to 100 ",num2);
   }
   else{
      printf("%d is nearest to 100 ",num1);
   }
}

if(num1 > 100 && num2 > 100){
   res1 = num1 - 100;
   res2 = num2 - 100;
   if(res1 > res2){
      printf("%d is nearest to 100 ",num2);
   }
   else{
      printf("%d is nearest to 100 ",num1);
   }
}
```

```
if(num1 < 100 && num2 > 100){
   res1 = 100 - num1;
   res2 = num2 - 100;
   if(res1 > res2){
      printf("%d is nearest to 100 ",num2);
   }
   else{
      printf("%d is nearest to 100 ",num1);
   }
}

if(num1 > 100 && num2 < 100){
   res1 = num1 - 100;
   res2 = 100 - num2;
   if(res1 > res2){
      printf("%d is nearest to 100 ",num2);
   }
   else{
      printf("%d is nearest to 100 ",num1);
   }
}



   return 0;
}
```

Output:

Case 1

```
Enter First Number :: 10
Enter Second Number :: 88
88 is nearest to 100
```

Case 2

```
Enter First Number :: 500
Enter Second Number :: 2000
500 is nearest to 100
```

Case 3

```
Enter First Number :: 90
Enter Second Number :: 415
90 is nearest to 100
```

Case 4

Enter First Number :: 110
Enter Second Number :: 73
110 is nearest to 100

Case 5

Enter First Number :: 11
Enter Second Number :: 11

5. 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 :
   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>

int main(){

char id[50],name[50];
float unit,charge,scharge;

printf("Enter customer id :: ");
fgets(id, 50 ,stdin);

printf("Enter customer name :: ");
fgets(name,50,stdin);

printf("Enter the unit consumed by user :: ");
scanf("%f",&unit);

if(unit <= 199){
   charge = unit * 1.20 ;
}

else if(unit == 200 || unit < 400){
  charge = unit * 1.50 ;



}

else if(unit == 400 || unit <600){
   charge = unit * 1.80 ;
}

else {
   charge = unit * 2.00 ;
}
```

```
if(charge > 400){
   scharge = charge * 0.15 ;
   charge = charge + scharge;
   if(charge < 100){
      charge = 100;
   }
}

printf("Electricity bill \n");
printf("------------------\n");

printf("ID :: %s \n",id);
printf("------------------\n");
printf("Name :: %s \n",name);
printf("------------------\n");
printf("Bill amount to be paid :: %g \n",charge);
printf("------------------\n");

  return 0;
}
```

OUTPUT:

```
Enter customer id :: S10CTC
Enter customer name :: SHREETIK
Enter the unit consumed by user :: 300
Electricity bill
------------------
ID :: S10CTC

------------------
Name :: SHREETIK

------------------
Bill amount to be paid :: 517.5
```

6. 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).

```
#include <stdio.h>

int main(){

float sub1,sub2,sub3,avg;

printf("Input the marks obtained in first subject :: ");
scanf("%f",&sub1);
printf("Input the marks obtained in second subject :: ");
scanf("%f",&sub2);
printf("Input the marks obtained in third subject :: ");
scanf("%f",&sub3);

avg = (sub1 + sub2 + sub3) / 3 ;

if(avg >= 90 && avg <= 100){
   printf("Your Grade is A");
}
else if(avg >= 80 && avg <= 89){
   printf("Your Grade is B");
}
else if(avg >= 70 && avg <= 79){
   printf("Your Grade is C");
}
else if(avg >= 60 && avg <= 69){
   printf("Your Grade is D");
}
```

```
else if(avg >= 0 && avg <= 59){
    printf("Your Grade is F");
}

 return 0;
}
```

Output:

```
Input the marks obtained in first subject :: 65
Input the marks obtained in second subject :: 45
Input the marks obtained in third subject :: 86
Your Grade is D
```

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

```
#include <stdio.h>

int main(){

int x;
printf("For january enter   >> 1 \n");
printf("For february enter  >> 2 \n");
printf("For march enter     >> 3 \n");
printf("For april enter     >> 4 \n");
printf("For may enter       >> 5 \n");
printf("For june enter      >> 6 \n");
printf("For july enter      >> 7 \n");
printf("For august enter    >> 8 \n");
printf("For september enter >> 9 \n");
printf("For ocrober enter   >> 10 \n");
printf("For november enter  >> 11 \n");
printf("For december enter  >> 12 \n");
printf("Enter the choice for showing the number of days in a month :: ");
scanf("%d",&x);

switch(x){
   case 1:
   printf("January has 31 days");
   break;

   case 2:
   printf("February has 28 days in a common year and 29 days in leap years");
   break;

   case 3:
   printf("March has 31 days");
   break;

   case 4:
   printf("April has 30 days");
   break;

   case 5:
   printf("May has 31 days");
   break;

   case 6:
   printf("June has 30 days");
```

```
    break;

    case 7:
    printf("July has 31 days");
    break;

    case 8:
    printf("August has 31 days");
    break;

    case 9:
    printf("September has 30 days");
    break;

    case 10:
    printf("October has 31 days");
    break;

    case 11:
    printf("November has 30 days");
    break;

    case 12:
    printf("December has 31 days");
    break;

    default:
    printf("Please enter a valid choice between 1 to 12");
}

 return 0;
}
```

Output:

```
For january enter      >> 1
For february enter    >> 2
For march enter       >> 3
For april enter         >> 4
For may enter          >> 5
For june enter         >> 6
For july enter          >> 7
For august enter      >> 8
For september enter >> 9
For ocrober enter      >> 10
For november enter  >> 11
For december enter  >> 12
Enter the choice for showing the number of days in a month :: 2
February has 28 days in a common year and 29 days in leap years
```

9. create Simple Calculator using switch case.

```
#include <stdio.h>

int main(){

float num1 ,num2,res;
int x;

printf("Enter first number :: ");
scanf("%f",&num1);
printf("Enter second number :: ");
scanf("%f",&num2);

printf("For addition       '+' enter 1 \n");
printf("For subtraction    '-' enter 2 \n");
printf("For multiplication  '*' enter 3 \n");
printf("For division       '/' enter 4 \n\n");

printf("Enter your choice :: ");
scanf("%d",&x);

switch(x){
   case 1:
   {
   res = num1 + num2;
   printf("%g + %g = %g",num1,num2,res);
   break;
   }

    case 2:
   {
   res = num1 - num2;
   printf("%g - %g = %g",num1,num2,res);
   break;
   }

    case 3:
   {
   res = num1 * num2;
   printf("%g * %g = %g",num1,num2,res);
   break;
   }
```

```
    case 4:
   {
   res = num1 / num2;
   printf("%g / %g = %g",num1,num2,res);
   break;
   }

   default:
   printf("Please enter a valid choice between 1 to 4");
}

 return 0;
}
```

Output:

```
Enter first number :: 67
Enter second number :: 58
For addition       '+' enter 1
For subtraction    '-' enter 2
For multiplication  '*' enter 3
For division       '/' enter 4

Enter your choice :: 1
67 + 58 = 125


Enter first number :: 5.5
Enter second number :: 6.8
For addition       '+' enter 1
For subtraction    '-' enter 2
For multiplication  '*' enter 3
For division       '/' enter 4

Enter your choice :: 3
5.5 * 6.8 = 37.4
```

10. Prompts the user to enter grade. Your program should display the corresponding meaning of grade as per the following table (Using Switch Case).

```
#include <stdio.h>

int main(){

char choice;

printf("Input your grade in upper-case :: ");
scanf("%c",&choice);

switch(choice){

   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;

   default:
   printf("Please Enter grade in Upper case beatween A B C D F");
   break;
}


 return 0;
}
```

Output:

Input your grade in upper-case :: F

Failing

Input your grade in upper-case :: a

Please Enter grade in Upper case beatween A B C D F

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,result;

printf("Enter a number :: ");
scanf("%d",&s);

printf("Enter a number greater than previous number :: ");
scanf("%d",&m);

printf("Enter a number greater than previous number :: ");
scanf("%d",&l);

if((m-s) == (l-m)){

   printf("True");
}
else{
   printf("False");
}
return 0;
}
```

Output:

```
Enter a number :: 5
Enter a number greater than previous number :: 10
Enter a number greater than previous number :: 15
True
```