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


```c

#include <stdio.h>
int main()
{
  char ch;
  printf("enter an alphabet\n");
  scanf("%c" ,&ch);
  if (ch=='a' || ch=='e' || ch=='i' ||ch=='o' || ch=='u')
  {
    printf("albhabet is a vowel");
  }
  else
  {
    printf("alphabet is consonet");
  }
  return 0;
}
```

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

```c
#include<stdio.h>
#include<math.h>
void main()
{
   float a,b,c,r1,r2,d;
//r1=root1,r=root2,d=discriminant
   printf("enter 3 variable a,b,c:");
   scanf("%f%f%f",&a,&b,&c);
   d=(b*b - 4*a*c);
   if (d==0)
   {
      printf("roots are real & equal");
      r1= -b/2*a;
      r2= -b/2*a;
      printf("root1=%f & root2=%f",r1,r2);
   }
   else if (d>0)
   {
```

```
    printf("roots are real & different");
    r1=(-b + sqrt (d))/(2*a);
    r2=(-b - sqrt(d))/ (2*a);
    printf("root1=%f",r1);
    printf("root2=%f",r2);
  }
  else
  {
    printf("roots are imaginary");
  }
}
```

```
enter 3 variable a,b,c:9 -6 9
roots are imaginary
```

**Q:3. Check Leap Year (Using if..else)**

```c
#include <stdio.h>

int main()
{
    int year;
    printf("enter a year:\n");
    scanf("%d",&year);
    if((year%4==0) && ((year%400==0) || (year%100!=0)))
    {
    printf("year  is a leap year",&year);
    }
    else
    {
    printf("year is not a leap year",&year);
    }
    return 0;
}
```

```
/tmp/bIiJw7ZyWZ.o
enter a year:
1455
year is not a leap year
```

**Q: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)**

```c
#include<stdio.h>
int main()
{
    int num1,num2;
    printf("enter two number:");
    scanf("%d%d",&num1,&num2);

    if (num1>num2)
    {
        printf("num1 is nearest to 100");
    }
else if(num2>num1)
{
    printf("num2 is nearest to 100");
}
else if (num1=num2)
return 0;
}
```

```
/tmp/bIiJw7ZyWZ.o
enter two number:3
4
num2 is nearest to 100
```

**Q: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)**

```c
#include<stdio.h>
int main()
{
    int small,medium,large;
    printf("enter 3 integer:");
    scanf("%d%d%d",&small,&medium,&large);
    if (small-medium != medium-large)
    {
        printf("it will be false");
    }
    else
    {
       printf("it will be true");
    }
    return 0;
}
```

```
/tmp/ZJtOXokW6A.o
enter 3 integer:1 2 3
it will be true
```

**Q: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>


int main()
{
   int unit;
   float charge;
   printf("enter an unit:");
   scanf("%d",&unit);
  // printf("enter an charge:");
  // scanf("%f\n",&charge);
   //minimum bill willbe of Rs.100/-
   if (unit <= 199)
   {
      printf("Bill %f",unit*1.20);
   }
   else if  (unit>=200 && unit<=400)
   {
      printf("Bill %f",unit*1.50);
   }
   else if (unit>=400 && unit<=600)
   //surchage of 15% will be charged
   {
      printf("Bill %f",unit*1.80+(unit*1.80)*.15);
```

```
    }
    else
    {
        printf("Bill %f",unit*2.0+(unit*2.0)*.15);
    }


    return 0;
}
```

**Q: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**

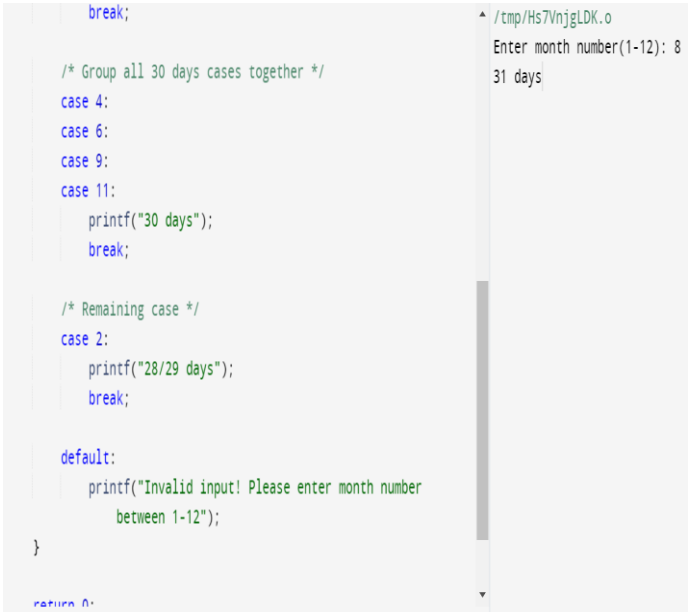

```
#include<stdio.h>
int main()
{
    int a,b,c,avg;
    //average=subject1+subject2+subject3/3
    printf("enter 3 subjects number\n");
    scanf("%d %d %d",&a,&b,&c);
    avg=(a+b+c)/3;
    printf("avg %d",avg);
    if (avg>=90 && avg<=100)
    {
        printf("congrats!,your score grade A");
    }
    else if (avg>=80 && avg<=89)
```

```
    {
        printf("you score grade B");
    }
    else if (avg>=70 && avg<=79)
    {
        printf("you score grade C ");
    }
    else if (avg>=60 && avg<=69
    {
        printf("you score grade D");
    }
    else
    {
        printf("you score grade F");
    }
    return 0;
}
```

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

```
#include <stdio.h>
int main()
{
    int month;

    /* Input month number from user */
    printf("Enter month number(1-12): ");
    scanf("%d", &month);

    switch(month)
    {
        /* Group all 31 days cases together */
        case 1:
        case 3:
        case 5:
        case 7:
        case 8:
        case 10:
        case 12:
            printf("31 days");
            break;

        /* Group all 30 days cases together */
        case 4:
        case 6:
        case 9:
        case 11:
            printf("30 days");
            break;

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

        default:
            printf("Invalid input! Please enter month number
                between 1-12");
    }

    return 0;
```

```
/tmp/Hs7VnjgLDK.o
Enter month number(1-12): 8
31 days
```



```
/tmp/Hs7VnjgLDK.o
Enter month number(1-12): 8
31 days
```

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

```
int main()
{
   int month;

   /* Input month number from user */
   printf("Enter month number(1-12): ");
   scanf("%d", &month);

   switch(month)
   {
      /* Group all 31 days cases together */
      case 1:
      case 3:
      case 5:
      case 7:
      case 8:
      case 10:
      case 12:
         printf("31 days");
         break;

      /* Group all 30 days cases together */
      case 4:
      case 6:
      case 9:
      case 11:
         printf("30 days");
         break;

      /* Remaining case */
      case 2:
```

```
            printf("28/29 days");
            break;

        default:
            printf("Invalid input! Please enter month number between 1-12");
    }

    return 0;
}
```

OUTPUT: Enter month number(1-12): 8

31 days

**Q:9: create Simple Calculator using switch case**.

```
#include <stdio.h>

int main()
{
    int a,b;
   char operator;
   printf("enter an operator(+,-,*,/):");
   scanf("%c",&operator);
   printf("enter 2 operands:");
   scanf("%d %d",&a,&b);
   switch(operator){
      case '+':
      printf("a+b=%d\n",a+b);
      break;
      case '-':
      printf("a-b=%d\n",a-b);
      break;
      case '*':
      printf("a*b=%d\n",a*b);
```

```
    break;
    case '/':
    printf("a/b=%d\n",a/b);
    break;
    //operator doesnot match any case constant
    default:
    printf("error!operator is not correct");
  }
  return 0;
}
```

**Q: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**


```
#include <stdio.h>
void main()
{
  char grade;
  printf("enter a grade:");
  scanf("%c",&grade);
  //determine & display 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");
    }
    return 0;
}
```

**Output:** enter a grade:A

Excellent

## ***PRACTICE QUESTIONS(OPTIONAL)***

**Q:11 Check whether a triangle is Equilateral, Isosceles or Scalene**

```
    #include<stdio.h>
int main()
{
    int x,y,z;
    //x,y,z represents 3 side of traiangle
    printf("enter 3 integer:");
   scanf("%d%d%d",&x,&y,&z);
   //check if whether triangle is equilateral,isosceles or scalene
   if ((x==y) && ((y==z) && (z==x)))
   {
        printf("the triangle is an equilateral");
```

```
  }
  else if((x==y) || ((y==z) || (z==x)))
  {
      printf("the triangle is an isosceles ");
  }
  else if ((x!=y) && ((y!=z) && (z!=x)))
  {
     printf("the traingle is a scalene");
  }
  return 0;
}
```

RESULT: enter 3 integer:2 2 2

the triangle is an equilateral

**Q: 12. Check Whether a Number is Even or Odd**

```
#include <stdio.h>
int main() {
   int num;
   printf("Enter an integer: ");
   scanf("%d", &num);
   // True if num is perfectly divisible by 2
   if(num % 2 == 0)
   {
      printf("%d is even.", num);
   }
   else
   {
      printf("%d is odd.", num);
   }
   return 0;
}
```

**Q:13. Check Whether a Character is an Alphabet or not**

```
#include <stdio.h>
int main() {
   char c;
   printf("Enter a character: ");
   scanf("%c", &c);
   if ((c >= 'a' && c <= 'z') || (c >= 'A' && c <= 'Z'))
   {
      printf("%c is an alphabet.", c);
   }
   else
   {
      printf("%c is not an alphabet.", c);
   }

   return 0;
}
```

**Q: 14. Find the Largest Number Among Three Numbers**

```
#include<stdio.h>
int main()
{
   int num1,num2,num3;
   printf("enetr 3 number:");
   scanf("%d%d%d",&num1,&num2,&num3);
   //identify which number is largest
   if (num1 > num2 && num1 > num3)
   {
      printf("num1 is largest");
   }
    if( num2 > num3 && num2 > num1)
   {
      printf("num2 is largest");
```

```
    }
     if ( num3 > num1 && num3 > num2)
    {
       printf("num3 is largest");
    }
     if (num1 == num2 && num1 == num3)
    {
       printf("all are equal");
    }
    return 0;
}
```

RESULT:

enter 3 number:9 7 8

num1 is largest

**Q:15. find the larger from two given integers. However, if the two integers have the same remainder when divided by 5, then the return the smaller integer. If the two integers are the same, return 0**

```
#include<stdio.h>
int main()
{
    int a,b;
    printf("enter 2 integer:");
    scanf("%d%d",&a,&b);
    if (a>b)
    {
       printf("a is larger integer");
    }
    else if (b>a)
    {
       printf("b is larger integer");
    }
```

```
   else if( a%5 == b%5)
   {
      printf("it'll return the small integer");
   }
   else if (a==b)
  {
     return 0;
  }
}
```

**Q:16. Find the eligibility of admission for a professional course based on the following criteria: Eligibility Criteria : Marks in Maths >=65 and Marks in Phy >=55 and Marks in Chem>=50 and Total in all three subject >=190 or Total in Maths and Physics >=140**

```
#include <stdio.h>
void main()
{  int p,c,m,t,mp;

  printf("Eligibility Criteria :\n");
  printf("Marks in Maths >=65\n");
  printf("and Marks in Phy >=55\n");
  printf("and Marks in Chem>=50\n");
  printf("and Total in all three subject >=190\n");
  printf("or Total in Maths and Physics >=140\n");
  printf("-------------------------------------\n");

  printf("Input the marks obtained in Physics :");
  scanf("%d",&p);
  printf("Input the marks obtained in Chemistry :");
  scanf("%d",&c);
  printf("Input the marks obtained in Mathematics :");
  scanf("%d",&m);
  printf("Total marks of Maths, Physics and Chemistry : %d\n",m+p+c);
```

```
  printf("Total marks of Maths and  Physics : %d\n",m+p);


  if (m>=65)
      if(p>=55)
        if(c>=50)
              if((m+p+c)>=190||(m+p)>=140)
                printf("The  candidate is eligible for admission.\n");
              else
                printf("The candidate is not eligible.\n");
        else
             printf("The candidate is not eligible.\n");
      else
           printf("The candidate is not eligible.\n");
   else
    printf("The candidate is not eligible.\n");
}
```

```
Eligibility Criteria :
Marks in Maths >=65
and Marks in Phy >=55
and Marks in Chem>=50
and Total in all three subject >=190
or Total in Maths and Physics >=140
-----------------------------------
Input the marks obtained in Physics :23
Input the marks obtained in Chemistry :45
Input the marks obtained in Mathematics :46
Total marks of Maths, Physics and Chemistry : 114
Total marks of Maths and  Physics : 69
The candidate is not eligible.
```

**Q:16. Calculate the monthly telephone bills as per the following rule: Minimum Rs. 200 for up to 100 calls. Plus Rs. 0.60 per call for next 50 calls. Plus Rs. 0.50 per call for next 50 calls. Plus Rs. 0.40 per call for any call beyond 200 calls**

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

```
int main()
{
   int calls;
   float bill;

   printf("Enter number of calls :");
   scanf("%d", &calls);

   if (calls <= 100)
   {
      bill = 200;
   }
   else if (calls > 100 && calls <= 150)
   {
      calls = calls - 100;
      bill = 200+(0.60 *calls);
   }
   else if (calls > 150 && calls <= 200)
   {
      calls = calls - 150;
      bill = 200+(0.60 *50) + (0.50 *calls);
   }
   else
   {
      calls = calls - 200;
      bill = 200 + (0.60 * 50) + (0.50 * 50) + (0.40 * calls);
   }

   printf("Your bill is Rs. %0.2f", bill);
```

```
    return 0;
}
```

```
Enter number of calls :34
Your bill is Rs. 200.00
```

**Q:17. 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 tmp;

   printf("Input days temperature : ");
   scanf("%d",&tmp);
  if(tmp<0)
  {
     printf("Freezing weather.\n");
  }
 else if(tmp<10)
 {
    printf("Very cold weather.\n");
 }
  else if(tmp<20)
 {
     printf("Very cold weather.\n");
 }
 else if(tmp<30)
 {
     printf("Normal in temp.\n");
 }
```

```
 else if(tmp<40)
 {
    printf("Its Hot.\n");
 }
  else
  {
     printf("Its Hot.\n");
  }
}
```

```
Input days temperature : 78
Its Hot.
```

**Q: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)
   {
      // Num is positive
   case 1:
      printf("%d is positive.", num);
   break;

   // Num is either negative or zero
   case 0:
```

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


return 0;
}
```

```
/tmp/J6IFVEJALL.o
Enter any number: 89
is positive.
```

**Q:19:print day of week name using switch case.**

```
#include <stdio.h>
int main()
{
   int week;
  /* Input week number from user */
   printf("Enter week number(1-7): ");
   scanf("%d", &week);
   switch(week)
   {
      case 1:
         printf("Monday");
         break;
      case 2:
```

```
            printf("Tuesday");
            break;
        case 3:
            printf("Wednesday");
            break;
        case 4:
            printf("Thursday");
            break;
        case 5:
            printf("Friday");
            break;
        case 6:
            printf("Saturday");
            break;
        case 7:
            printf("Sunday");
            break;
        default:
            printf("Invalid input! Please enter week number between 1-7.");
    }

    return 0;
}
```

```
Enter week number(1-7): 5
Friday
```

**Q: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, discriminant;
printf("Enter value of a,b,c of quadratic equation (aX^2 + bX + c): ");
scanf("%f%f%f", &a,&b,&c);
// Find discriminant of the equation
discriminant = (b * b) - (4 * a * c);
switch(discriminant > 0)
{
case 1:
   // If discriminant is positive
   root1 = (-b + sqrt(discriminant)) / (2 * a);
   root2 = (-b - sqrt(discriminant)) / (2 * a);
   printf("Two distinct and real roots exists: %.2f and %.2f",
         root1, root2);
   break;
case 0:
   // If discriminant is not positive
   switch(discriminant < 0)
   {
   case 1:
      // If discriminant is negative
      root1 = root2 = -b / (2 * a);
      imaginary = sqrt(-discriminant) / (2 * a);
      printf("Two distinct complex roots exists: %.2f + i%.2f and %.2f - i%.2f",
            root1, imaginary, root2, imaginary);
      break;
   case 0:
      // If discriminant is zero
      root1 = root2 = -b / (2 * a);
      printf("Two equal and real roots exists: %.2f and %.2f", root1, root2);
      break;
```

```
    }
  }
  return 0;
}
```

```
Enter value of a,b,c of quadratic equation (aX^2 + bX + c): 8 -9 -5
Two distinct and real roots exists: 1.53 and -0.41
```