Q1. Check Whether a Character is a Vowel or Consonant.

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

OUTPUT:

Enter an alphabet: a

a is a vowel.

Q2. Find Roots of a Quadratic Equation.

```c
#include<stdio.h>
#include<math.h>
int main(){
```

```c
    double a, b, c, D, root1, root2, realPart, imagPart;
printf("Enter coefficients a, b and c: ");
scanf("%lf %lf %lf", &a, &b, &c);

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

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


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


else {
    realPart = -b / (2 * a);
    imagPart = sqrt(-D) / (2 * a);
    printf("root1 = %.2lf+%.2lfi and root2 = %.2f-%.2fi", realPart,
imagPart, realPart, imagPart);
}
    return 0;
}
```

Enter coefficients a, b and c: 10

20

25

root1 = -1.00+1.22i and root2 = -1.00-1.22i

Q3. Check Leap Year.

```c
#include<stdio.h>
int main(){
    int year;
    printf("Enter year: ");
    scanf("%d",&year);
    if(year % 4 == 0)
    {
        if( year % 100 == 0)
        {
            if ( year % 400 == 0)
                printf("%d is a Leap Year", year);
            else
                printf("%d is not a Leap Year", year);
        }
        else
            printf("%d is a Leap Year", year);
    }
```

```
    else
        printf("%d is not a Leap Year", year);


        return 0;
}
```

Enter year: 2020

2020 is a Leap Year

Q4. check which number nearest to the value 100 among two given integers. Return 0 if the two numbers are equal.

```
#include <stdio.h>
#include <stdlib.h>
int main(){
    int x,y;
    int const n=100;
    printf("Enter two integers: ");
    scanf("%d %d",&x,&y);
    int a = abs(x-100);
    int b = abs(y-100);
    if(x==y){
        printf("0");
    }
```

```c
        else {

                if(a<b){

                        printf("%d",x);

                        return x;

                }

                else

                printf("%d",y);

                return y;

        }

}
```

Enter two integers: 95

95

0

Q5. 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.

```c
#include <stdio.h>

int main(){

        int x, y, z;

        printf("Enter 3 integers: ");

        scanf("%d %d %d",&x,&y,&z);
```

```c
if (x > y && x > z && y > z){

        printf("True");

        return x - y == y - z;


}


else if (x > y && x > z && z > y){

    printf("True");

    return x - z == z - y;


}


else if (y > x && y > z && x > z) {

    printf("True");

    return y - x == x - z;


}


else if (y > x && y > z && z > x) {

    printf("True");

    return y - z == z - x;


}
```

```c
    else if (z > x && z > y && x > y){

            printf("True");

            return z - x == x - y;


    }
    else if (z > x && z > y && y > x){

            printf("True");

    return z - y == y - x;


    }
    else

    printf("False");


}
```

Enter 3 integers: 10

20

30

True

Q6. Calculate and print the Electricity bill of a given customer. The customer id., name and unit consumed by the user should be taken

```c
#include<stdio.h>
#include<stdlib.h>
int main(){
  int custid,cust_unit ;
  float charge, surchrg=0, bill,total_amt;
  char custname[25];

  printf("Input customer id: ");
  scanf("%d",&custid);
  printf("Input the name of the customer: ");
  scanf("%s",custname);
  printf("Input the unit consumed by the customer : ");
  scanf("%d",&cust_unit);
      if (cust_unit <200 )
            charge = 1.20;
      else if (cust_unit>=200 && cust_unit<400)
            charge = 1.50;
      else if (cust_unit>=400 && cust_unit<600)
            charge = 1.80;
```

```c
        else

            charge = 2.00;
    bill = cust_unit*charge;
    if (bill>400)
        surchrg = bill*15/100.0;
    total_amt = bill+surchrg;
    if (total_amt  < 100)
        total_amt =100;
    printf("\nElectricity Bill\n");
    printf("Customer ID: %d\n",custid);
    printf("Customer Name: %s\n",custname);
    printf("Unit Consumed: %d\n",cust_unit);
    printf("Amount Charges Rs. %.2f  per unit :%.2f\n",charge,bill);
    printf("Surchage Amount: %.2f\n",surchrg);
    printf("Net Amount Paid By the Customer: %.2f\n",total_amt);


}
```

OUTPUT:

Input customer id: 1

Input the name of the customer: ram

Input the unit consumed by the customer : 550

Electricity Bill

Customer ID: 1

Customer Name: ram

Unit Consumed: 550

Amount Charges Rs. 1.80 per unit :990.00

Surchage Amount: 148.50

Net Amount Paid By the Customer: 1138.50

Q7. 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 m1, m2, m3, avg;
    printf("Enter the marks: ");
    scanf("%f %f %f",&m1,&m2,&m3);
    avg = (m1+m2+m3)/3;
    if(avg>=90 && avg<=100){
        printf("Grade:A");
        }
    else if(avg>=80 && avg<=89){
        printf("Grade:B");
        }
    else if(avg>=70 && avg<=79){
```

```c
            printf("Grade:C");
        }
        else if(avg>=60 && avg<=69){
            printf("Grade:D");
        }
        else{
            printf("Grade:F");
        }


        return 0;
}
```

OUTPUT:

Enter the marks: 90

95

98

Grade:A

Q8. Print total number of days in a month using switch case.

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

```c
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");
```

```c
            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("Please enter month number between 1-12");

    }

    return 0;
}
```

OUTPUT:

Enter month number(1-12): 10

31 days

Q9. Create Simple Calculator using switch case.

```c
#include<stdio.h>
int main(){
    int a, b, result;
    char op;
    printf("Enter an expression: ");
    scanf("%d %c %d", &a, &op, &b);

    switch(op)
    {
        case '+':
            result = a + b;
            break;
        case '-':
            result = a - b;
            break;
        case '*':
            result = a * b;
            break;
        case '/':
            result = a / b;
```

```c
case '%':

        result = a % b;


        break;
            default:
    printf("Operator is not correct");

  }



  printf("Result = %d", result);



  return 0;

}
```

OUTPUT:

Enter an expression: 50/2

Result = 25

Q10. 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.

```c
#include <stdio.h>

int main(){

  char grade;

      printf("enter grade: ");
```

```c
    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;
        default:
            printf("Invalid grade");
        }
        return 0;
}
```

enter grade: B

Good

PRACTICE QUESTIONS:

Q11. Check whether a triangle is Equilateral, Isosceles or Scalene.

```c
#include <stdio.h>
int main(){
    int s1, s2, s3;
    printf("Enter three sides of triangle: ");
    scanf("%d %d %d", &s1, &s2, &s3);
        if(s1==s2 && s2==s3)
    {
      printf("Equilateral triangle");
    }
    else if(s1==s2 || s1==s3 || s2==s3)
    {
        printf("Isosceles triangle.");
    }
    else
    {
        printf("Scalene triangle.");
    }
```

```
    return 0;
}
```

Enter three sides of triangle: 20

10

20

Isosceles triangle.

Q12. Check Whether a Number is Even or Odd.

```c
#include <stdio.h>
int main(){
    int no;
    printf("Enter a number: ");
    scanf("%d",&no);
        if(no%2==0){
      printf("%d is even number",no);
    }
    else{
        printf("%d is odd number",no);
    }

    return 0;
}
```

Enter a number: 101

101 is odd number

Q13. Check Whether a Character is an Alphabet or not.

```c
#include <stdio.h>
int main(){
    char c;
    printf("Enter a character: ");
    scanf("%c", &c);
        if((c>= 97 && c<= 122) || (c>= 65 && c<= 90))
                printf("The character %c is an Alphabet",c);
        else
                printf("The character %c is not an Alphabet",c);
        return 0;
}
```

OUTPUT: Enter a character: g

The character g is an Alphabet

Q14. Find the Largest Number Among Three Numbers.

```c
#include <stdio.h>
int main(){
    int n1, n2, n3;
    printf("Enter three different numbers: ");
    scanf("%d %d %d", &n1, &n2, &n3);
        if (n1 >= n2 && n1 >= n3)
```

```c
        printf("%d is the largest number.", n1);
            if (n2 >= n1 && n2 >= n3)
            printf("%d is the largest number.", n2);
            if (n3 >= n1 && n3 >= n2)
            printf("%d is the largest number.", n3);


    return 0;
}
```

OUTPUT: Enter three different numbers: 20

50

10

50 is the largest number.

Q15. 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.

```c
#include<stdio.h>
int main(){
int x,y;
printf("Enter two integers: ");
scanf("%d %d",&x,&y);
    if(x == y){
            printf("0");
    return 0;
```

```c
    }
    else if((x % 5 == y % 5 && x < y) || x > y){
        printf("%d",x);
        return x;
    }
    else{
        printf("%d",y);
        return y;
    }
}
```

OUTPUT: Enter two integers: 42

22

42

Q16. 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.

```c
#include <stdio.h>
int main(){
    int p,c,m;
    printf("Eligibility Criteria: \n");
    printf("Input the marks obtained in Physics: ");
    scanf("%d",&p);
```

```c
    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&&p>=55&&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");
        }


}
```

Input the marks obtained in Physics: 90

Input the marks obtained in Chemistry: 80

Input the marks obtained in Mathematics: 96

Total marks of Maths, Physics and Chemistry: 266

Total marks of Maths and Physics: 186

The candidate is eligible for admission.

Q17. 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 call.

```c
#include<stdio.h>
int main(){
int calls,bal1;
float bal2,bal3,bal4;
printf("Enter the Number of Calls: ");
scanf("%d",&calls);
bal1=200;
bal2=200+(0.60*calls);
bal3=200+(0.60*calls)+(0.50*calls);
bal4=200+(0.60*calls)+(0.50*calls)+(0.40*calls);
if (calls<=100)
      printf("Total bill: %d",bal1);
else if (calls>100 && calls<=150)
```

```c
        printf("Total bill: %.2f \n",bal2);
else if (calls>150 && calls<=200)
        printf("Total bill: %.2f \n",bal3);
else
  printf("Total bill: %.2f \n",bal4);
return 0;
}
```

OUTPUT: Enter the Number of Calls: 550

Total bill: 1025.00

Q18. 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.

```c
#include<stdio.h>
int main(){
        int temp;
        printf("Enter temperature in centigrade: ");
        scanf("%d",&temp);
        if(temp<0){
                printf("Freezing weather");
        }
        else if(temp>=0 && temp<=10){
```

```c
            printf("Very cold weather");
        }
        else if(temp>=10 && temp<=20){
            printf("Cold weather");
        }
        else if(temp>=20 && temp<=30){
            printf("Normal in temperature");
        }
        else if(temp>=30 && temp<=40){
            printf("Hot weather");
        }
        else{
            printf("Very hot weather");
        }
}
```

OUTPUT: Enter temperature in centigrade: 28

Normal in temperature

Q19. Check whether a number is positive, negative or zero using switch case.

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

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

    switch (num > 0)
    {
        case 1:
            printf("%d is positive number.", num);
        break;
                case 0:
            switch (num < 0)
            {
                case 1:
                    printf("%d is negative number.", num);
                    break;
                case 0:
                    printf("Number is %d.", num);
                    break;
            }
        break;
    }
return 0;
}
```

OUTPUT: Enter any number: -15

-15 is negative number.

Q20. Print day of week name using switch case.

```c
#include <stdio.h>

int main(){
    int week;
    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");
```

```c
        break;
      case 6:
        printf("Saturday");
        break;
      case 7:
        printf("Sunday");
        break;
      default:
        printf("Please enter week number between 1-7.");
    }

    return 0;
}
```

OUTPUT: Enter week number(1-7): 6

Saturday

Q21. Find roots of a quadratic equation using switch case.

```c
#include <stdio.h>
#include <math.h>
int main(){
    float a, b, c;
    float root1, root2, imaginary;
    float d;
        printf("Enter values of a, b, c : ");
```

```c
scanf("%f %f %f", &a, &b, &c);
    d = (b * b) - (4 * a * c);
    switch(d > 0)
{
    case 1:
        //positive
        root1 = (-b + sqrt(d)) / (2 * a);
        root2 = (-b - sqrt(d)) / (2 * a);

        printf("root1 = %.2lf and root2 = %.2lf", root1, root2);
        break;


    case 0:
        //not positive
        switch(d< 0)
        {
            case 1:
                //negative
                root1 = root2 = -b / (2 * a);
                imaginary = sqrt(-d) / (2 * a);

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

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

            printf("root1 = root2 = %.2lf;", root1);

            break;
    }
}

    return 0;
}
```

Enter values of a, b, c : 4

-2

-10

root1 = 1.85 and root2 = -1.35