

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

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

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

    if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')) {
        if (ch=='a' || ch=='A' || ch=='e' || ch=='E' || ch=='i' || ch=='I' || ch=='o' || ch=='O' || ch=='u' ||
ch=='U')
            printf("%c is a vowel.\n", ch);
        else
            printf("%c is a consonant.\n", ch);
    }
    else
        printf("%c is neither a vowel nor a consonant.\n", ch);

    return 0;
}
```

Output:

```
Input a character:V
V is a consonant.

...Program finished with exit code 0
Press ENTER to exit console.█
```

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

```
#include <stdio.h>
#include <math.h> /* Used for sqrt() */

int main(){
    float a, b, c;
    float root1, root2, imaginary;
    float discriminant;

    printf("Enter values 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);

    if(discriminant > 0) {
        root1 = (-b + sqrt(discriminant)) / (2*a);
        root2 = (-b - sqrt(discriminant)) / (2*a);

        printf("Two distinct and real roots exists: %.2f and %.2f", root1, root2);
    }
    else if(discriminant == 0) {
        root1 = root2 = -b / (2 * a);

        printf("Two equal and real roots exists: %.2f and %.2f", root1, root2);
    }
    else if(discriminant < 0) {
        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);
    }

    return 0; }
```

Output:

```
Enter values of a, b, c of quadratic equation (aX^2 + bX + c): 80 60 90
Two distinct complex roots exists: -0.38 + i0.99 and -0.38 - i0.99

...Program finished with exit code 0
Press ENTER to exit console. █
```

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

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

    // leap year if perfectly visible by 400
    if (year % 400 == 0) {
        printf("%d is a leap year.", year);
    }
    // not a leap year if visible by 100
    // but not divisible by 400
    else if (year % 100 == 0) {
        printf("%d is not a leap year.", year);
    }
    // leap year if not divisible by 100
    // but divisible by 4
    else if (year % 4 == 0) {
        printf("%d is a leap year.", year);
    }
    // all other years are not leap year
    else {
        printf("%d is not a leap year.", year);
    }

    return 0;
}
```

Output:

```
Enter a year: 1997
1997 is not a leap year.

...Program finished with exit code 0
Press ENTER to exit console.█
```

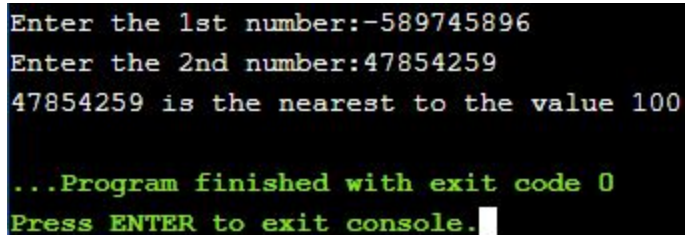
4. Check which number nearest to the value 100 among two given integers. Return 0 if the two numbers are equal. (Using nested if...else)

```
#include <stdio.h>
int main()
{
    int i1,i2,d1,d2;
    printf("Enter the 1st number:");
    scanf("%d",&i1);
    printf("Enter the 2nd number:");
    scanf("%d",&i2);

    d1 = i1 - 100;
    d2 = i2 - 100;

    if(i1 == i2){
        printf("Both the numbers are equal");
        return 0;
    }
    if (d1 < d2){
        printf("%d is the nearest to the value 100",i2);
    }
    else{
        printf("%d is the nearest to the value 100",i1);
    }
    return 0;
}
```

Output:

A screenshot of a terminal window with a black background and white and green text. The text shows the program's execution: it prompts for two numbers, receives -589745896 and 47854259, and then outputs that 47854259 is the nearest to 100. It also shows the program finishing with exit code 0 and a prompt to press ENTER to exit the console.

```
Enter the 1st number:-589745896
Enter the 2nd number:47854259
47854259 is the nearest to the value 100

...Program finished with exit code 0
Press ENTER to exit console.
```

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 the same. (Using nested if...else).

```
#include <stdio.h>
int main(){
    int n1,n2,n3;
    printf("Enter the 1st no:");
    scanf("%d",&n1);
    printf("Enter the 2nd no:");
    scanf("%d",&n2);
    printf("Enter the 3rd no:");
    scanf("%d",&n3);
    if (n1 == n2 && n1 == n3 && n3 == n2)
    {
        printf("The numbers are equivalent to each other");
    }
    if(n1 == n2)
    {
        printf("Two of the given nos are equivalent");
    }
    if(n3 == n2)
    {
        printf("Two of the given nos are equivalent");
    }
    if(n1 == n3)
    {
        printf("Two of the given nos are equivalent");
    }
    if(n1>n2 && n1>n3 && n2>n3)
    {
        return n1-n2 == n3-n2;
    }
    else{
        return 1;
    }
    if(n1>n2 && n1>n3 && n3>n2)
    {
```

```

        return n1-n3 == n3-n2;
    }
    else{
        return 1;
    }
    if(n2>n1 && n2>n3 && n1>n3){
        return n2-n1 == n1-n3;
    }
    else{
        return 1;
    }

    if(n2>n1 && n2>n3 && n3>n1){
        return n2 -n1 == n3-n1;
    }
    else{
        return 1;
    }

    if(n3>n1 && n3>n2 && n1>n2){
        return n3-n1 == n1-n2;
    }
    else{
        return 1;
    }
    if(n3>n1 && n3>n2 && n2>n1){

        return n3-n2 == n2-n1;
    }
    else{
        return 1;
    }
}

```

Output:

```

Enter the 1st no:54
Enter the 2nd no:55
Enter the 3rd no:56

...Program finished with exit code 1
Press ENTER to exit console.

```

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<math.h>
#include<string.h>

int main()
{
    int cstdid;
    char name[20];
    float unit,ta;
    printf("Please Enter your customer Id:");
    scanf("%d",&cstdid);
    printf("Please Enter consumer name:");
    scanf("%s",&name);
    printf("Please Enter unit consumed:");
    scanf("%f",&unit);

    if(ta > 400)
    {
        ta = ta + ((ta*15)/100);
        printf("%s your total bill amount is %f",name,ta);
    }
    if(unit <= 199)
    {
        ta = 1.20 * unit;
        printf("%s YOUR TOTAL BILL AMOUNT is %f",name,ta);
    }
}
```

```

else if(unit >= 200 && unit < 400)
{
    ta = 1.50 * unit;
    printf("%s YOUR TOTAL BILL AMOUNT is %f",name,ta);
}
else
{

    if(unit >= 400 && unit < 600)

    {
        ta = 1.80 * unit;
        printf("%s YOUR TOTAL BILL AMOUNT is %f",name,ta);

    }
else if(unit >= 600)
{
    ta = 2.00 * unit;
    printf("%s YOUR TOTAL BILL AMOUNT is %f",name,ta);
}
}
}

```

Output:

```

Please Enter your 10 digit customer Id:or
Please Enter consumer name:oi
Please Enter unit consumed:499

oi YOUR TOTAL BILL AMOUNT is 898.200012

...Program finished with exit code 0
Press ENTER to exit console.

```


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()
{
    float marks1, marks2, marks3, average;

    printf("Enter marks obtained in subject 1 :");
    scanf("%f", &marks1);
    printf("Enter marks obtained in subject 2 :");
    scanf("%f", &marks2);
    printf("Enter marks obtained in subject 3 :");
    scanf("%f", &marks3);

    average = (marks1 + marks2 + marks3) / 3;
    printf("Average : %0.2f\n", average);

    if (average >= 90)
    {
        printf("You secured Grade A");
    }
    else if (average >= 80)
    {
        printf("You secured Grade B");
    }
    else if (average >= 70)
    {
        printf("You secured Grade C");
    }
    else if (average >= 60)
```

```
{  
    printf("You secured Grade D");  
}  
Else  
{  
    printf("You secured Grade F");  
}  
  
return 0;  
}
```

Output:

```
Enter marks obtained in subject 1 :85  
Enter marks obtained in subject 2 :45  
Enter marks obtained in subject 3 :15  
Average : 48.33  
Grade F  
  
...Program finished with exit code 0  
Press ENTER to exit console.□
```

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)
    {
        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): 2
28/29 days

...Program finished with exit code 0
Press ENTER to exit console.
```

9. create Simple Calculator using switch case.

```
#include <stdio.h>

int main() {
    char operator;
    double first, second;
    printf(" ***** [CALCULATOR] *****");
    printf("\nEnter an operator (+, -, *,): ");
    scanf("%c", &operator);
    printf("Enter two operands: ");
    scanf("%lf %lf", &first, &second);

    switch (operator) {
        case '+':
            printf("Addition: (%.1lf + %.1lf = %.1lf)", first, second, first + second);
            break;
        case '-':
            printf("subtraction: (%.1lf - %.1lf = %.1lf)", first, second, first - second);
            break;
        case '*':
            printf("Multiplication: (%.1lf * %.1lf = %.1lf)", first, second, first * second);
            break;
        case '/':
            printf("Division: (%.1lf / %.1lf = %.1lf)", first, second, first / second);
            break;
        // operator doesn't match any case constant
        default:
            printf("Error! operator is not correct");
    }
    return 0;
}
```

Output:

```
***** [CALCULATOR] *****
Enter an operator (+, -, *,): *
Enter two operands: 40 587
Multiplication: (40.0 * 587.0 = 23480.0)

...Program finished with exit code 0
Press ENTER to exit console.
```

10. 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

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

```
int main()
{
    char grade
;
    printf("Enter GRADE: ");
    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("ENTER THE APPROPRIATE GRADE i.e from (A-F)");  
    break;  
}  
return 0;  
  
}
```

Output:



```
Enter GRADE: F  
FAILING  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```

Practice Questions:

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

```
#include <stdio.h>

int main()
{
    int side1, side2, side3;

    printf("Enter three sides of triangle: ");
    scanf("%d %d %d", &side1, &side2, &side3);

    if(side1==side2 && side2==side3)
    {
        printf("Equilateral triangle.");
    }
    else if(side1==side2 || side1==side3 || side2==side3)
    {
        printf("Isosceles triangle.");
    }
    else
    {
        printf("Scalene triangle.");
    }

    return 0;
}
```

Output:

```
Enter three sides of triangle: 4 5 6
Scalene triangle.

...Program finished with exit code 0
Press ENTER to exit console. □
```


12. Check Whether a Number is Even or Odd

```
#include <stdio.h>
int main()
{
    int n1;


    printf("Enter a number:")
    scanf("%d",&n1);

    if(n1 % 2 == 0)

    printf("The number is even:");
    else
        printf("The number is odd");

    return 0;
}
```

Output:



```
Enter a number:-78
The number is even:

...Program finished with exit code 0
Press ENTER to exit console. □
```

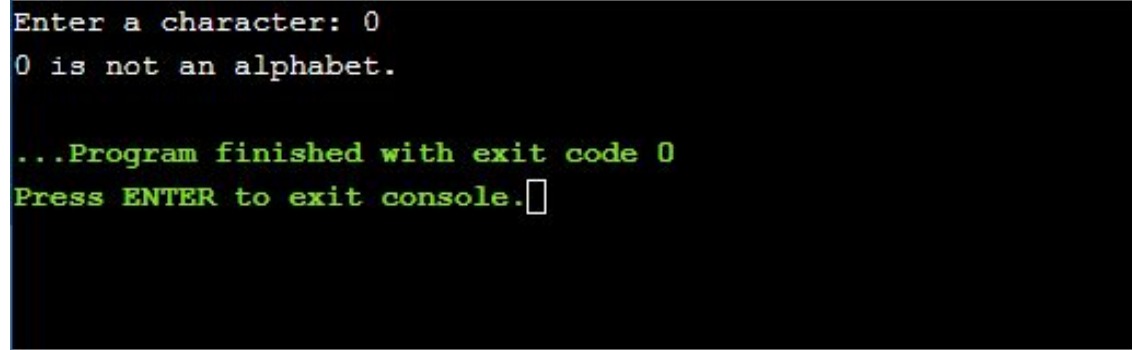
13. Check Whether a Character is an Alphabet or not

```
#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;
}
```

Output:



```
Enter a character: 0
0 is not an alphabet.

...Program finished with exit code 0
Press ENTER to exit console. □
```

14. Find the Largest Number Among Three Numbers

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

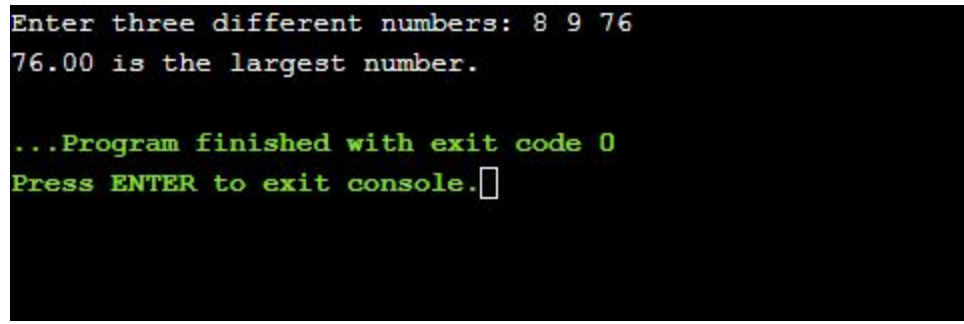
    // if n1 is greater than both n2 and n3, n1 is the largest
    if (n1 >= n2 && n1 >= n3)
        printf("%.2f is the largest number.", n1);

    // if n2 is greater than both n1 and n3, n2 is the largest
    if (n2 >= n1 && n2 >= n3)
        printf("%.2f is the largest number.", n2);

    // if n3 is greater than both n1 and n2, n3 is the largest
    if (n3 >= n1 && n3 >= n2)
        printf("%.2f is the largest number.", n3);

    return 0;
}
```

Output:



```
Enter three different numbers: 8 9 76
76.00 is the largest number.

...Program finished with exit code 0
Press ENTER to exit console.□
```

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>
#include <stdlib.h>
int main(void){
    printf("%d",test(11, 21));
    printf("\n%d",test(11, 20));
    printf("\n%d",test(10, 10));
}
int test(int x, int y, int z)
{
    if (x == y)
    {
        return 0;
    }
    else if ((x % 5 == y % 5 && x < y) || x > y)
    {
        return x;
    }
    else
    {
        return y;
    }
}
```

Output:

```
11
20
0

...Program finished with exit code 0
Press ENTER to exit console.□
```

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>
int main()
{
    int mth,phy,chem,Total, Tmp;
    printf("please enter secured marks in MATH:");
    scanf("%d",&mth);
    printf("Please enter the secured marks in PHYSICS:");
    scanf("%d",&phy);
    printf("Please entet the secured marks in CHEMISTRY:");
    scanf("%d",&chem);

    Total = mth + phy + chem;
    Tmp = mth + phy;

    if(mth >= 65 && phy >= 55 && chem >= 50 && Total >= 190 || Tmp >= 140)
        printf("\n****CONGRATULATIONS ****\nThe Student passes the eligible criteria hence
eligible for the admission");
    else
        printf("\nUNFORTUNATELY\nThe Student doesn't passes the eligibility criteria, hence not
eligible for the admission");

    return 0;
}
```

Output:

```
please enter secured marks in MATH:78
Please enter the secured marks in PHYSICS:80
Please entet the secured marks in CHEMISTRY:60

****CONGRATULATIONS ****
The Student passes the eligible criteria hence eligible for the admission

...Program finished with exit code 0
Press ENTER to exit console. █
```

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

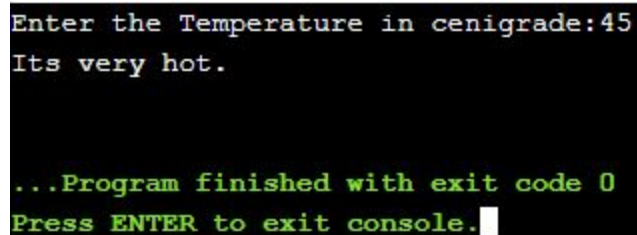
Temp 30-40 then Its Hot

Temp >=40 then Its Very Hot

```
#include<stdio.h>
int main()
{
    int tmp;
    printf("Enter the Temperature in cenigrade:");
    scanf("%d",&tmp);

    if(tmp<0)
        printf("Freezing weather.\n");
    else if(tmp<10)
        printf("Very cold weather.\n");
    else if(tmp<20)
        printf("Cold weather.\n");
    else if(tmp<30)
        printf("Normal in temp.\n");
    else if(tmp<40)
        printf("Its Hot.\n");
    else
        printf("Its very hot.\n");
}
```

Output:



```
Enter the Temperature in cenigrade:45
Its very hot.

...Program finished with exit code 0
Press ENTER to exit console.
```

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

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

Output:

```
Enter any number: 85
85 is positive.

...Program finished with exit code 0
Press ENTER to exit console.█
```

19. print day of week name using switch case.

```
#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");
            break;
        case 6:
            printf("Saturday");
            break;
        case 7:
            printf("Sunday");
            Break;

        default:
            printf("Invalid input! Please enter week number between 1-7.");
```



```
}  
  
    return 0;  
}
```

Output:

```
Enter week number(1-7): 6  
Saturday  
  
...Program finished with exit code 0  
Press ENTER to exit console.█
```

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;
    float discriminant;

    printf("Enter values of a, b, c of quadratic equation (aX^2 + bX + c): ");
    scanf("%f%f%f", &a, &b, &c);

    /* Calculate discriminant */
    discriminant = (b * b) - (4 * a * c);

    /* Compute roots of quadratic equation based on the nature of discriminant */
    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;
}

```

Output:

```

Enter values of a, b, c of quadratic equation (aX^2 + bX + c): 7 89 54
Two distinct and real roots exists: -0.64 and -12.08

...Program finished with exit code 0
Press ENTER to exit console.

```