

Programming Fundamentals

1. C “Hello, World!” Program

```
#include<stdio.h>

int main()
{
    printf("Hello, World!");
    return 0;
}
```

2. C Program to print an integer (Entered by the user)

```
#include<stdio.h>

int main()
{
    int number;

    printf("Enter an integer: ",number);
    scanf("%d", &number);
    printf("You entered: %d", number);
    return 0;
}
```

3. C Program to add two integers

```
#include<stdio.h>

int main()
{
    int number1, number2, sum;
```

```
    printf("Enter two integers: ");
    scanf("%d %d", &number1, &number2);
    sum = number1 + number2;
    printf("%d + %d = %d", number1, number2, sum);
    return 0;
}
```

4. C Program to multiply two floating point numbers

```
#include<stdio.h>
int main()
{
    double a=2.2;
    double b=3.13;
    double product;
    product = a * b;
    printf("product = %.21f", product);
    return 0;
}
```

5. C Program to find ASCII value of a character

```
#include<stdio.h>
int main()
{
    char c;
    printf("Enter a character: ");
    scanf("%c", &c);
    printf("ASCII value of %c = %d",c,c);
    return 0;
}
```

```
}
```

6. C Program to compute Quotient and Remainder

```
#include<stdio.h>

int main()
{
    int dividend, divisor, quotient, remainder;

    printf("Enter dividend: ");
    scanf("%d", &dividend);
    printf("Enter divisor: ");
    scanf("%d", &divisor);

    quotient = dividend / divisor;
    remainder = dividend % divisor;

    printf("Quotient = %d\n", quotient);
    printf("Remainder = %d", remainder);

    return 0;
}
```

7. C Program to find the size of int, float, double and char

```
#include<stdio.h>

int main()
{
    int inttype;
    float floattype;
    double doubletype;
    char chartype;

    printf("Size of int: %1d bytes\n", sizeof(inttype));
    printf("Size of float: %1d bytes\n", sizeof(floattype));
}
```

```
    printf("Size of double: %1d bytes\n", sizeof(doubletype));  
    printf("Size of char: %1d bytes\n", sizeof(chartype));  
    return 0;  
}
```

8. C Program to demonstrate the working of keyword long

```
#include<stdio.h>  
  
int main()  
{  
    int a;  
    long b;  
    long long c;  
    double e;  
    long double f;  
    printf("Size of int = %1d bytes \n",sizeof(a));  
    printf("Size of long = %1d bytes \n",sizeof(b));  
    printf("Size of long long = %1d bytes \n",sizeof(c));  
    printf("Size of double = %1d bytes \n",sizeof(e));  
    printf("Size of long double = %1d bytes \n",sizeof(f));  
    return 0;  
}
```

9. C Program to swap two numbers

```
#include<stdio.h>  
  
int main()  
{  
    double first=5.25;  
    double second=6.45;
```

```
double temp;
temp = first;
first = second;
second = temp;
printf("\nAfter swaping, first number = %.21f\n", first);
printf("\nAfter swaping, second number = %.21f\n", second);
return 0;
}
```

10. C Program to check whether a number is even or odd

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

```
int main()
```

```
{
```

```
int number;
```

```
printf("Enter a number: ");
```

```
scanf("%d", &number);
```

```
if(number % 2 == 0){
```

```
printf("%d is even",number);
```

```
}else{
```

```
printf("%d is odd",number);
```

```
}
```

```
return 0;
```

```
}
```

11. C Program to check whether a character is vowel or consonant

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

```
int main()
```

```

{
    char c;

    int lowercase, uppercase;

    printf("Enter an alphabet: ");
    scanf("%c", &c);

    lowercase = (c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u');
    uppercase = (c == 'A' || c == 'E' || c == 'O' || c == 'o' || c == 'U');
    if(lowercase || uppercase){
        printf("%c is a vowel", c);
    }else{
        printf("%c is a consonant", c);
    }

    return 0;
}

```

12. C Program to 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 >= n2 && n1 >= n3)
        printf("%.2f is the largest number.", n1);
    if (n2 >= n1 && n2 >= n3)
        printf("%.2f is the largest number.", n2);
}

```

```

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

    return 0;
}

```

13. C Program to find all roots of a Quadratic Equation

```

#include <math.h>
#include <stdio.h>
int main() {
    double a, b, c, discriminant, root1, root2, realPart, imagPart;
    printf("Enter coefficients a, b and c: ");
    scanf("%lf %lf %lf", &a, &b, &c);
    discriminant = b * b - 4 * a * c;

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

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

    else {
        realPart = -b / (2 * a);

```

```

    imagPart = sqrt(-discriminant) / (2 * a);
    printf("root1 = %.2lf+%.2lfi\nroot2 = %.2f-%.2fi", realPart, imagPart, realPart, imagPart);
}
return 0;
}

```

14. C Program to check leap year

```

#include <stdio.h>
int main()
{
    int year;
    printf("Enter a year: ");
    scanf("%d", &year);
    if (year % 4 == 0) {
        if (year % 100 == 0) {
            // the year is a leap year if it is divisible by 400.
            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;
}

```


15. C Program to check whether a number is positive or negative

```
#include <stdio.h>

int main() {
    double num;
    printf("Enter a number: ");
    scanf("%lf", &num);
    if (num <= 0.0) {
        if (num == 0.0)
            printf("You entered 0.");
        else
            printf("You entered a negative number.");
    } else
        printf("You entered a positive number.");
    return 0;
}
```

16. C Program to check whether a character is an alphabet or not

```
#include <stdio.h>

int main()
{
    char ch;
    printf("\n Please Enter any character \n");
    scanf("%c", &ch);

    if( (ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z') )
        printf("\n %c is an Alphabet", ch);
}
```

```
else
    printf("\n %c is not an Alphabet", ch);

return 0;
}
```

17. C Program to calculate the sum of natural numbers

```
#include <stdio.h>

int main() {
    int n, i, sum = 0;

    printf("Enter a positive integer: ");
    scanf("%d", &n);

    for (i = 1; i <= n; ++i) {
        sum += i;
    }

    printf("Sum = %d", sum);
    return 0;
}
```

18. C Program to find factorial of a number

```
#include<stdio.h>

int main(){
    int i,f=1,num;

    printf("Enter a number: ");
```

```
scanf("%d",&num);

for(i=1;i<=num;i++)
    f=f*i;

printf("Factorial of %d is: %d",num,f);
return 0;
}
```

19. C Program to generate multiplication table

```
#include <stdio.h>

int main() {
    int n, i;
    printf("Enter an integer: ");
    scanf("%d", &n);
    for (i = 1; i <= 10; ++i) {
        printf("%d * %d = %d \n", n, i, n * i);
    }
    return 0;
}
```

20. C Program to display Fibonacci sequence

```
#include <stdio.h>

int main()
{
    int i, n, t1 = 0, t2 = 1, nextTerm;
    printf("Enter the number of terms: ");
    scanf("%d", &n);
```

```

printf("Fibonacci Series: ");

for (i = 1; i <= n; ++i) {
    printf("%d, ", t1);
    nextTerm = t1 + t2;
    t1 = t2;
    t2 = nextTerm;
}

return 0;
}

```

21. C Program to find GCD of two numbers

```

#include <stdio.h>

int main()
{
    int n1, n2, i, gcd;
    printf("Enter two integers: ");
    scanf("%d %d", &n1, &n2);
    for(i=1; i <= n1 && i <= n2; ++i)
    {

        if(n1%i==0 && n2%i==0)
            gcd = i;
    }
    printf("G.C.D of %d and %d is %d", n1, n2, gcd);
    return 0;
}

```

22. C Program to find LCM of two numbers

```
#include <stdio.h>

int main()
{
    int n1, n2, min;

    printf("Enter two positive integers: ");
    scanf("%d %d", &n1, &n2);

    min = (n1 > n2) ? n1 : n2;

    while (1) {
        if (min % n1 == 0 && min % n2 == 0) {
            printf("The LCM of %d and %d is %d.", n1, n2, min);
            break;
        }
        ++min;
    }

    return 0;
}
```

23. C Program to display characters from A to Z using loop

```
#include <stdio.h>

int main()
{
    char c;

    for (c = 'A'; c <= 'Z'; ++c)
        printf("%c ", c);

    return 0;
}
```

24. C Program to count the number of digits in an integer

```
#include <stdio.h>

int main()
{
    long long n;
    int count = 0;
    printf("Enter an integer: ");
    scanf("%lld", &n);

    while (n != 0) {
        n /= 10;    // n = n/10
        ++count;
    }

    printf("Number of digits: %d", count);
    return 0;
}
```

25. C Program to reverse a number

```
#include <stdio.h>

int main()
{
    int n, r = 0;
    printf("Enter a number to reverse\n");
    scanf("%d", &n);
    while (n != 0)
    {
        r = r * 10;
```

```
r = r + n%10;
n = n/10;
}
printf("Reverse of the number = %d\n", r);
return 0;
}
```

26. C Program to calculate the power of a number

```
#include <stdio.h>

int main()
{
    int base, exp;

    long long result = 1;

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

    printf("Enter an exponent: ");
    scanf("%d", &exp);

    while (exp != 0) {
        result *= base;
        --exp;
    }

    printf("Answer = %lld", result);

    return 0;
}
```

27. C Program to check whether a number is palindrome or not

```
#include <stdio.h>

int main()
{
    int n, reversedN = 0, remainder, originalN;

    printf("Enter an integer: ");

    scanf("%d", &n);

    originalN = n;

    while (n != 0) {
        remainder = n % 10;
        reversedN = reversedN * 10 + remainder;
        n /= 10;
    }

    if (originalN == reversedN)
        printf("%d is a palindrome.", originalN);
    else
        printf("%d is not a palindrome.", originalN);

    return 0;
}
```

28. C Program to check whether a number is prime or not

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



```
int main()
{
    int n, i, flag = 0;
    printf("Enter a positive integer: ");
    scanf("%d", &n);

    for (i = 2; i < n / 2; ++i) {

        if (n % i == 0) {
            flag = 1;
            break;
        }
    }

    if (n == 1) {
        printf("1 is neither prime nor composite.");
    }
    else {
        if (flag == 0)
            printf("%d is a prime number.", n);
        else
            printf("%d is not a prime number.", n);
    }

    return 0;
}
```

29. C Program to display prime numbers between two intervals

```
#include <stdio.h>

int main()
{
    int low, high, i, flag;
    printf("Enter two numbers(intervals): ");
    scanf("%d %d", &low, &high);
    printf("Prime numbers between %d and %d are: ", low, high);

    while (low < high) {
        flag = 0;

        for (i = 2; i <= low / 2; ++i) {
            if (low % i == 0) {
                flag = 1;
                break;
            }
        }

        if (flag == 0)
            printf("%d ", low);
        ++low;
    }

    return 0;
}
```

30. C Program to check Armstrong number

```
#include <stdio.h>

int main()
{
    int num, originalNum, remainder, result = 0;

    printf("Enter a three-digit integer: ");

    scanf("%d", &num);

    originalNum = num;

    while (originalNum != 0) {
        remainder = originalNum % 10;
        result += remainder * remainder * remainder;
        originalNum /= 10;
    }

    if (result == num)
        printf("%d is an Armstrong number.", num);
    else
        printf("%d is not an Armstrong number.", num);

    return 0;
}
```