



Top 50 C Coding Interview Questions and Answers (2024)

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C is the most popular programming language developed by Dennis Ritchie at the Bell Laboratories in 1972 to develop the UNIX operating systems. It is a general-purpose and procedural programming language. It is faster than the languages like Java and Python. C is the most used language in top companies such as **LinkedIn, Microsoft, Opera, Meta,** and **NASA** because of its performance. To crack into these companies and other software companies, you need to master C.

This interview preparation guide on **C Coding Interview Questions** offers a comprehensive collection of practice questions suitable for both beginners and advanced learners.

List of 50 C Coding Interview Questions and Answers

Here is a list of 50 C coding interview questions and answers, to fully prepare for your next interview and ace those tough coding challenges, our [C programming course](#) offers a complete guide, including mock interview questions and detailed explanations.

1. Find the largest number among the three numbers.

C

```
1 // C Program to find
2 // Largest of three numbers
3 #include <stdio.h>
4
```



```
int main()
6 {
7     int a = 1, b = 2, c = 3;
8
9     // condition for a is greatest
10    if (a > b && a > c)
11        printf("%d", a);
12
13    // condition for b is greatest
14    else if (b > a && b > c)
15        printf("%d", b);
16
17    // remaining conditions
18    // c is greatest
19    else
20        printf("%d", c);
21
22    return 0;
23 }
```

Output

3

2. Write a Program to check whether a number is prime or not.

C



```
1 // C Program for Checking value is
2 // Prime or not
3 #include <stdbool.h>
4 #include <stdio.h>
5
6 int main() {
7     int n = 91;
8
9     int cnt = 0;
10
11    // If number is less than/equal to 1,
12    // it is not prime
```

```
14         if (n <= 1)
15             printf("%d is NOT prime\n", n);
16         else {
17             // Check for divisors from 1 to n
18             for (int i = 1; i <= n; i++) {
19
20                 // Check how many number is divisible
21                 // by n
22                 if (n % i == 0)
23                     cnt++;
24             }
25
26             // If n is divisible by more than 2
27             numbers
28             // then it is not prime
29             if (cnt > 2)
30                 printf("%d is NOT prime\n", n);
31
32             // else it is prime
33             else
34                 printf("%d is prime", n);
35         }
36     return 0;
37 }
```

Output

91 is NOT prime

3. Write a C program to calculate Compound Interest.

C

```
1 // C program to calculate Compound Interest
2 #include <stdio.h>
3
4 // For using pow function we must
5 // include math.h
6 #include <math.h>
```

```
8 // Driver code
9 int main()
10 {
11     // Principal amount
12     double principal = 2300;
13
14     // Annual rate of interest
15     double rate = 7;
16
17     // Time
18     double time = 4;
19
20     // Calculating compound Interest
21     double amount
22         = principal * ((pow((1 + rate / 100),
23 time)));
24     double CI = amount - principal;
25
26     printf("Compound Interest is : %lf", CI);
27     return 0;
28 }
```

Output

Compound Interest is : 714.830823

4. Write a Program in C to Swap the values of two variables without using any extra variable.

C



```
1 // C Program to
2 // Swap two numbers
3 // No Extra Space
4 #include <stdio.h>
5
6 int main()
7 {
8
```

```
    int x = 10;
10    int y = 20;
11
12    printf("x: %d , y: %d\n", x, y);
13
14    // Code to swap 'x' and 'y'
15    x = x + y;
16    y = x - y;
17    x = x - y;
18
19    printf("x: %d , y: %d\n", x, y);
20
21    return 0;
22 }
```

Output

x: 10 , y: 20
x: 20 , y: 10

5. Write a Program to Replace all 0's with 1's in a Number.

C


```
1 // C Program for
2 // Replacing 0 to 1
3 #include <math.h>
4 #include <stdio.h>
5
6 int main()
7 {
8     int N = 102301;
9
10    int ans = 0;
11    int i = 0;
12    while (N != 0) {
13        // Condition to change value
14        if (N % 10 == 0)
15            ans = ans + 1 * pow(10, i);
16        else
```



```
        ans = ans + (N % 10) * pow(10, i);  
18  
19        N = N / 10;  
20        i++;  
21    }  
22  
23    printf("%d", ans);  
24  
25    return 0;  
26 }
```

Output:

112311

6. Write a Program to convert the binary number into a decimal number.

C

```
 1 // C Program for converting  
 2 // binary to decimal  
3 #include <stdio.h>  
4  
5 int main()  
6 {  
7     int N = 11011;  
8  
9     // Initializing base value a to 1  
10    int a = 1;  
11    int ans = 0;  
12    while (N != 0) {  
13        ans = ans + (N % 10) * a;  
14        N = N / 10;  
15        a = a * 2;  
16    }  
17  
18    printf("%d", ans);  
19    return 0;
```

}

Output

27

7. Write a Program to check if the year is a leap year or not.

C



```
1 // C Program to check
2 // Year is leap year or not
3 #include <stdio.h>
4
5 // Function Declaration to check leap year
6 void leap_year(int year)
7 {
8     // If a year is multiple of 400, then leap year
9     if (year % 400 == 0)
10         printf("%d is a leap year.\n", year);
11
12     // If a year is multiple of 100, then not a leap
    year
13     else if (year % 100 == 0)
14         printf("%d is not a leap year.\n", year);
15
16     // If a year is multiple of 4, then leap year
17     else if (year % 4 == 0)
18         printf("%d is a leap year.\n", year);
19
20     // Not leap year
21     else
22         printf("%d is not a leap year.\n", year);
23 }
24
25 int main()
26 {
27     leap_year(2000);
28     leap_year(2002);
29     leap_year(2008);
30 }
```

```
        return 0;  
32    }
```

Output

2000 is a leap year.
2002 is not a leap year.
2008 is a leap year.

8. Write a program to Factorial of a Number.

C

```
1  // C Program to calculate  
2  // Factorial of a number  
3  #include <stdio.h>  
4  
5  // Calculating factorial using iteration  
6  void factorial_iteration(int N)  
7  {  
8      unsigned long long int ans = 1;  
9      for (int i = 1; i <= N; i++) {  
10         ans = ans * i;  
11     }  
12  
13     printf("Factorial of %d is %lld\n", N, ans);  
14 }  
15  
16 // Calculating factorial using recursion  
17 int factorial(int N)  
18 {  
19     if (N == 0)  
20         return 1;  
21  
22     // Recursive call  
23     return N * factorial(N - 1);  
24 }  
25  
26 int main()  
27 {
```



```
    int n;  
29    n = 13;  
30    factorial_iteration(n);  
31  
32    n = 9;  
33    printf("Factorial of %d using recursion:%d\n",  
    n,  
34           factorial(n));  
35  
36    return 0;  
37 }
```

Output

Factorial of 13 is 6227020800

Factorial of 9 using recursion:362880

9. Write a Program to Check if a number is an Armstrong number or not.

C

```
1 // C program to check if number  
2 // is Armstrong number or not  
3 #include <stdio.h>  
4  
5 // Function to calculate x raised to the power y  
6 int power(int x, unsigned int y)  
7 {  
8     if (y == 0)  
9         return 1;  
10    if (y % 2 == 0)  
11        return power(x, y / 2) * power(x, y /  
12        2);  
13    return x * power(x, y / 2) * power(x, y /  
14    2);  
15 }  
16 // Function to calculate order of the number  
17 int order(int n)
```

```

    {
19         int res = 0;
20         while (n) {
21             res++;
22             n = n / 10;
23         }
24         return res;
25     }
26
27     // Function to check whether the given number is
28     // Armstrong number or not
29     int isArmstrong(int x)
30     {
31         // Calling order function
32         int n = order(x);
33         int temp = x, sum = 0;
34         while (temp) {
35             int r = temp % 10;
36             sum += power(r, n);
37             temp = temp / 10;
38         }
39
40         // If satisfies Armstrong condition
41         if (sum == x)
42             return 1;
43         else
44             return 0;
45     }
46
47     // Driver Program
48     int main()
49     {
50         int x = 120;
51         if (isArmstrong(x) == 1)
52             printf("True\n");
53         else
54             printf("False\n");
55
56         x = 1634;
57         if (isArmstrong(x) == 1)
58             printf("True\n");
59         else
60             printf("False\n");
61     }
```

```
        return 0;  
63    }
```

Output

False

True

10. Write a program to Find all the roots of a quadratic equation in C.

C



```
1  // C program to find roots  
2  // of a quadratic equation  
3  #include <math.h>  
4  #include <stdio.h>  
5  #include <stdlib.h>  
6  
7  // Prints roots of quadratic equation ax*2 + bx  
  + x  
8  void find_roots(int a, int b, int c)  
9  {  
10     // If a is 0, then equation is not  
    quadratic, but  
11     // linear  
12     if (a == 0) {  
13         printf("Invalid");  
14         return;  
15     }  
16  
17     int d = (b * b) - (4 * a * c);  
18     double sqrt_val = sqrt(abs(d));  
19  
20     if (d > 0) {  
21         printf("Roots are real and different  
    \n");  
22         printf("%f\n%f", (double)(-b +  
    sqrt_val) / (2 * a),  
23         (double)(-b - sqrt_val) / (2 *  
    a));
```

```

    }
25     else if (d == 0) {
26         printf("Roots are real and same \n");
27         printf("%f", -(double)b / (2 * a));
28     }
29     else // d < 0
30     {
31         printf("Roots are complex \n");
32         printf("%f + i%f\n%f - i%f", -(double)b
/ (2 * a),
33             sqrt_val / (2 * a), -(double)b /
(2 * a),
34             sqrt_val / (2 * a));
35     }
36 }
37
38 // Driver code
39 int main()
40 {
41     int a = 1, b = -16, c = 1;
42
43     // Function call
44     find_roots(a, b, c);
45     return 0;
46 }

```

Output:

Roots are real and different

15.937254

0.062746

11. Write a Program to reverse a number.

C

```

1 // C Programs to Calculate
2 // reverse of a number
3 #include <stdio.h>
4

```

```
// Iterative approach
6 int reverse_iteration(int N)
7 {
8     int ans = 0;
9     while (N != 0) {
10
11         ans = ans * 10 + (N % 10);
12         N = N / 10;
13     }
14
15     return ans;
16 }
17
18 // recursive approach
19 int reverse(int n, int ans)
20 {
21     if (n == 0)
22         return ans;
23
24     ans = ans * 10 + n % 10;
25     return reverse(n / 10, ans);
26 }
27
28 int main()
29 {
30     int N = 15942;
31     printf("Initial number:%d\n", N);
32
33     N = reverse_iteration(N);
34     printf("%d after reverse using iteration\n", N);
35
36     int ans = 0;
37     ans = reverse(N, ans);
38     printf("%d after again reverse using recursion'\n",
39           ans);
40
41     return 0;
42 }
```

Output

Initial number:15942

24951 after reverse using iteration

15942 after again reverse using recursion

12. Check whether a number is a palindrome.

C

```
1 // C Program for
2 // Checking Palindrome
3 #include <stdio.h>
4
5 // Checking if the number is
6 // Palindrome number
7 void check_palindrome(int N)
8 {
9     int T = N;
10    int rev = 0; // This variable stored reversed
    digit
11
12    // Execute a while loop to reverse digits of g:
13    // number
14    while (T != 0) {
15        rev = rev * 10 + T % 10;
16        T = T / 10;
17    }
18
19    // Compare original_number with reversed number
20    if (rev == N)
21        printf("%d is palindrome\n", N);
22    else
23        printf("%d is not a palindrome\n", N);
24 }
25
26 int main()
27 {
28     int N = 13431;
29     int M = 12345;
30
31     // Function call
32     check_palindrome(N);
33     check_palindrome(M);
34
35     return 0;
```

```
}
```

Output

```
13431 is palindrome
12345 is not a palindrome
```

13. Write a C Program to check if two numbers are equal without using the bitwise operator.

C

```
1 // C Program for checking numbers
2 // are equal using bitwise operator
3 #include <stdio.h>
4
5 int main()
6 {
7     int x = 1;
8     int y = 2;
9
10    // Using XOR
11    // XOR of two equal numbers is 0
12    if (!(x ^ y))
13        printf(" %d is equal to %d ", x, y);
14    else
15        printf(" %d is not equal to %d ", x, y);
16
17    return 0;
18 }
```

Output

```
1 is not equal to 2
```

14. Write a C program to find the GCD of two numbers.

C



```
1 // C program to find GCD of two numbers
2 #include <math.h>
3 #include <stdio.h>
4
5 // Function to return gcd of a and b
6 int gcd(int a, int b)
7 {
8     // Find Minimum of a and b
9     int result = ((a < b) ? a : b);
10    while (result > 0) {
11        if (a % result == 0 && b % result == 0) {
12            break;
13        }
14        result--;
15    }
16    return result; // return gcd of a and b
17 }
18
19 // Driver program to test above function
20 int main()
21 {
22     int a = 98, b = 56;
23     printf("GCD of %d and %d is %d ", a, b, gcd(a,
24         b));
25     return 0;
26 }
```

Output

GCD of 98 and 56 is 14

15. Write a C program to find the LCM of two numbers.

C

```
1 // C program to find
2 // LCM of two numbers
```



```
#include <stdio.h>

4
5 // minimum of two numbers
6 int Min(int Num1, int Num2)
7 {
8     if (Num1 >= Num2)
9         return Num2;
10    else
11        return Num1;
12 }
13
14 int LCM(int Num1, int Num2, int K)
15 {
16     // If either of the two numbers
17     // is 1, return their product
18     if (Num1 == 1 || Num2 == 1)
19         return Num1 * Num2;
20
21     // If both the numbers are equal
22     if (Num1 == Num2)
23         return Num1;
24
25     // If K is smaller than the
26     // minimum of the two numbers
27     if (K <= Min(Num1, Num2)) {
28
29         // Checks if both numbers are
30         // divisible by K or not
31         if (Num1 % K == 0 && Num2 % K == 0) {
32
33             // Recursively call LCM() function
34             return K * LCM(Num1 / K, Num2 / K,
35 2);
36         }
37
38         // Otherwise
39         else
40             return LCM(Num1, Num2, K + 1);
41     }
42
43     // If K exceeds minimum
44     else
45         return Num1 * Num2;
46 }
```

```
47 int main()
48 {
49     // Given N & M
50     int N = 12, M = 9;
51
52     // Function Call
53     int ans = LCM(N, M, 2);
54
55     printf("%d", ans);
56
57     return 0;
58 }
```

Output

36

16. Write a C Program to find the Maximum and minimum of two numbers without using any loop or condition.

C

```
1 // C Program to check
2 // Maximum and Minimum
3 // Between two numbers
4 // Without any condition or loop
5 #include <stdio.h>
6 #include <stdlib.h>
7
8 int main()
9 {
10     int a = 55, b = 23;
11
12     // return maximum among the two numbers
13     printf("max = %d\n", ((a + b) + abs(a - b)) /
14         2);
15
16     // return minimum among the two numbers
17     printf("min = %d", ((a + b) - abs(a - b)) / 2);
```

```
18     return 0;
19 }
```

Output

```
max = 55
min = 23
```

17. Write a Program in C to Print all natural numbers up to N without using a semi-colon.

C

```
1 // C program to print
2 // all natural numbers
3 // upto N without using semi-colon
4 #include <stdio.h>
5 #define N 10
6
7 int main(int val)
8 {
9     if (val <= N && printf("%d ", val) && main(val
10     }
11 }
```

Output

```
1 2 3 4 5 6 7 8 9 10
```

18. Write a Program to find the area of a circle.

C

```
1 // C program to find area
2 // of circle
```

```
▶ #include <math.h>
4 #include <stdio.h>
5 #define PI 3.142
6
7 double findArea(int r) { return PI * pow(r, 2);
  }
8
9 int main()
10 {
11     printf("Area is %f", findArea(5));
12     return 0;
13 }
```

Output

Area is 78.550000

19. Write a Program to create a pyramid pattern using C.

C

```
1 // C Program print Pyramid pattern
2 #include <stdio.h>
3
4 int main()
5 {
6     int N = 5;
7
8     // Outer Loop for number of rows
9     for (int i = 1; i <= N; i++) {
10
11         // inner Loop for space printing
12         for (int j = 1; j <= N - i; j++)
13             printf(" ");
14
15         // inner Loop for star printing
16         for (int j = 1; j <= 2 * i; j++)
17             printf("*");
18         printf("\n");
19     }
20     return 0;
```

}

Output

```

*
***
*****
*****
*****

```

20. Write a program to form Pascal Triangle using numbers.

```

      1
     1 1
    1 2 1
   1 3 3 1
  1 4 6 4 1

```

C

```

1 // C Program to print
2 // Pascal's Triangle
3 #include <stdio.h>
4
5 int main()
6 {
7     int n = 5;
8
9
10    for (int i = 1; i <= n; i++) {
11        for (int j = 1; j <= n - i; j++) {
12            printf(" ");
13        }
14
15        int x = 1;
16
17        for (int j = 1; j <= i; j++) {
18            printf("%d ", x);
19            x = x * (i - j) / j;

```

```
    }
21     printf("\n");
22 }
23
24     return 0;
25 }
```

Output

```
    1
  1  1
1  2  1
1  3  3  1
1  4  6  4  1
```

21. Write a Program to return the nth row of Pascal's triangle.

C

```
1 // C program to return the Nth row of pascal's
  triangle
2 #include <stdio.h>
3
4 // Print the N-th row of the Pascal's Triangle
5 void generateNthrow(int N)
6 {
7     // nC0 = 1
8     int prev = 1;
9     printf("%d", prev);
10
11     for (int i = 1; i <= N; i++) {
12         // nCr = (nCr-1 * (n - r + 1)) / r
13         int curr = (prev * (N - i + 1)) / i;
14         printf(",%d ", curr);
15         prev = curr;
16     }
17 }
18
19 int main()
20 {
```



```
    int n = 5;
22    generateNthrow(n);
23    return 0;
24 }
```

Output

1,5 ,10 ,10 ,5 ,1

22. Write a program to reverse an Array.

C

```
  1 // C Program to reverse
2 // An array
3 #include <stdio.h>
4
5 void reverse(int* arr, int n)
6 {
7     // Swapping front and back elements.
8     for (int i = 0, j = n - 1; i < j; i++, j--)
9     {
10         int ele = arr[i];
11         arr[i] = arr[j];
12         arr[j] = ele;
13     }
14
15 int main()
16 {
17
18     int arr[] = { 1, 2, 3, 4, 5 };
19     // Function Call
20     reverse(arr, 5);
21
22     // reverse array element printing
23     for (int i = 0; i < 5; i++)
24         printf("%d ", arr[i]);
25
26     return 0;
```

```
}
```

Output

5 4 3 2 1

23. Write a program to check the repeating elements in C.

C

```
1 // C Program for
2 // checking duplicate
3 // values in a array
4 #include <stdio.h>
5
6 int Sort(int arr[], int size)
7 {
8     for (int i = 0; i < size - 1; i++) {
9
10         for (int j = 0; j < size - i - 1; j++) {
11             if (arr[j] > arr[j + 1]) {
12                 int temp = arr[j];
13                 arr[j] = arr[j + 1];
14                 arr[j + 1] = temp;
15             }
16         }
17     }
18 }
19
20 // find repeating element
21 void findRepeating(int arr[], int n)
22 {
23     int count = 0;
24     for (int i = 0; i < n; i++) {
25
26         int flag = 0;
27         while (i < n - 1 && arr[i] == arr[i + 1])
28         {
29             flag = 1;
30             i++;
31         }
32     }
33 }
```



```
32         if (flag)
33             printf("%d ", (arr[i - 1]));
34     }
35     return;
36 }
37
38 int main()
39 {
40     int arr[] = { 1, 3, 4, 1, 2, 3, 5, 5 };
41
42     int n = sizeof(arr) / sizeof(arr[0]);
43
44     Sort(arr,n);
45
46     findRepeating(arr,n);
47
48
49
50     return 0;
51 }
```

Output

1 3 5

24. Write a Program to print the Maximum and Minimum elements in an array.

C

```
1 // C Program for calculating
2 // maximum and minimum element
3 #include <stdio.h>
4
5 void find_small_large(int arr[], int n)
6 {
7     int min, max;
8
9     // assign first element as minimum and maximum
```



```
    min = arr[0];
11    max = arr[0];
12
13    for (int i = 1; i < n; i++) {
14
15        // finding smallest here
16        if (arr[i] < min)
17            min = arr[i]; // finding largest here
18        if (arr[i] > max)
19            max = arr[i];
20    }
21    printf("Maximum: %d and Minimum: %d\n", min,
max);
22 }
23
24 int main()
25 {
26     int arr[] = { 15, 14, 35, 2, 11, 83 };
27     int len = sizeof(arr) / sizeof(arr[0]);
28
29     // Function call
30     find_small_large(arr, len);
31
32     return 0;
33 }
```

Output

Smallest: 2 and Largest: 83

25. Write a Program for the cyclic rotation of an array to k positions.

C

```
 1 // C program to rotate
 2 // Array by k elements
3 #include <stdio.h>
4
5 // Print array
```

```
void printArray(int arr[], int n)
7 {
8     int i;
9     for (i = 0; i < n; i++)
10         printf("%d ", arr[i]);
11 }
12
13 // Caculates greatest common divisor
14 int gcd(int a, int b)
15 {
16     if (b == 0)
17         return a;
18     else
19         return gcd(b, a % b);
20 }
21
22 // Rotate array
23 void Rotate(int arr[], int k, int N)
24 {
25     int i, j, a, temp;
26     k = k % N;
27
28     int rotate = gcd(k, N);
29
30     for (i = 0; i < rotate; i++) {
31
32         temp = arr[i];
33         j = i;
34         while (1) {
35             a = j + k;
36             if (a >= N)
37                 a = a - N;
38             if (a == i)
39                 break;
40             arr[j] = arr[a];
41             j = a;
42         }
43         arr[j] = temp;
44     }
45 }
46
47 int main()
48 {
49     int arr[] = { 1, 2, 3, 4, 5 };
```

```
51     // Rotating array
52     Rotate(arr, 2, 5);
53
54     // Printing array
55     printArray(arr, 5);
56
57     return 0;
58 }
```

Output

3 4 5 1 2

26. Write a Program to sort First half in Ascending order and the Second in Descending order.

C

```
1 // C Program for Sorting
2 // First half in Ascending order
3 // and Second Descending order
4 #include <stdio.h>
5
6 void Sort_asc_desc(int arr[], int n)
7 {
8     int temp;
9     for (int i = 0; i < n - 1; i++) {
10         for (int j = i + 1; j < n; j++) {
11             if (arr[i] > arr[j]) {
12                 temp = arr[i];
13                 arr[i] = arr[j];
14                 arr[j] = temp;
15             }
16         }
17     }
18
19     // printing first half in ascending order
20     for (int i = 0; i < n / 2; i++)
21         printf("%d ", arr[i]);
```

```

23     // printing second half in descending order
24     for (int j = n - 1; j >= n / 2; j--)
25         printf("%d ", arr[j]);
26 }
27
28 int main()
29 {
30     int arr[] = { 11, 23, 42, 16, 83, 73, 59 };
31     int N = sizeof(arr) / sizeof(arr[0]);
32
33     Sort_asc_desc(arr, N);
34
35     return 0;
36 }

```

Output

11 16 23 83 73 59 42

27. Write a Program to print sums of all subsets in an array.

C

```

1 // C Program to print sum of
2 // all subsets
3 #include <stdio.h>
4
5 // Function to print sum of subset
6 // Using recursion
7 void subset_sum(int arr[], int i, int j, int
sum)
8 {
9     if (i > j) {
10         printf("%d ", sum);
11         return;
12     }
13
14     subset_sum(arr, i + 1, j, sum + arr[i]);
15     subset_sum(arr, i + 1, j, sum);
16 }

```

```
18 // driver code
19 int main()
20 {
21     int arr[] = { 1, 2, 3 };
22     int n = sizeof(arr) / sizeof(arr[0]);
23
24     // Function calling to print subset sum
25     subset_sum(arr, 0, n - 1, 0);
26     return 0;
27 }
```

Output

6 3 4 1 5 2 3 0

28. Write a Program to Find if there is any subarray with a sum equal to 0.

C

```
1 // C Program to check 0 sum
2 // subarray possible
3 #include <stdio.h>
4
5 int main()
6 {
7     // array
8     int arr[] = { -2, 2, 1, 1, 8 };
9     int n = sizeof(arr) / sizeof(arr[0]);
10
11     int flag = 0, sum;
12
13     // Traversing array to check
14     for (int i = 0; i < n; i++) {
15
16         for (int j = i; j < n; j++) {
17             sum += arr[j];
18
19             if (sum == 0) {
```

```
        flag = 1;
21        printf(
22            "True subarray with 0 sum
    is possible");
23        break;
24    }
25 }
26 }
27
28 if (flag == 0)
29     printf("No such condition");
30 }
```

Output

True subarray with 0 sum is possible

29. Write a C program to Implement Kadane's Algorithm

C

```
1 // C program to implement Kadane's Algorithm
2 #include <limits.h>
3 #include <stdio.h>
4
5 int main()
6 {
7     int a[] = { -2, -3, 4, -1, -2, 1, 5, -3 };
8     int n = sizeof(a) / sizeof(a[0]);
9
10    int max_so_far = INT_MIN, max_ending_here =
    0,
11        start = 0, end = 0, s = 0;
12
13    for (int i = 0; i < n; i++) {
14        max_ending_here += a[i];
15
16        if (max_so_far < max_ending_here) {
17            max_so_far = max_ending_here;
18            start = s;
19            end = i;
```

```

        }
21
22     if (max_ending_here < 0) {
23         max_ending_here = 0;
24         s = i + 1;
25     }
26 }
27 printf("Maximum contiguous sum is %d\n",
max_so_far);
28 printf("Starting index %d Ending index %d",
start, end);
29
30 return 0;
31 }

```

Output

Maximum contiguous sum is 7
Starting index 2 Ending index 6

30. Write a Program to find the transpose of a matrix.

C

```

1  #include <stdio.h>
2
3  // This function stores transpose of A[][] in B[][]
4  void transpose(int N, int M, int A[M][N], int B[N]
[M])
5  {
6      int i, j;
7      for (i = 0; i < N; i++)
8          for (j = 0; j < M; j++)
9              B[i][j] = A[j][i];
10 }
11
12 int main()
13 {
14     int M = 3;
15     int N = 4;
16

```



```

18         { 2, 2, 2, 2 },
19         { 3, 3, 3, 3 } };
20
21 // Note dimensions of B[][]
22 int B[N][M], i, j;
23
24 transpose(N, M, A, B);
25
26 printf("Result matrix is \n");
27 for (i = 0; i < N; i++) {
28     for (j = 0; j < M; j++)
29         printf("%d ", B[i][j]);
30     printf("\n");
31 }
32
33 return 0;
34 }

```

Output

```

Result matrix is
1 2 3
1 2 3
1 2 3
1 2 3

```

31. Write a Program to Rotate a matrix by 90 degrees in the clockwise direction in C.

C



```

1 // C Program to rotate the array
2 // By 90 degree in clockwise direction
3 #include <stdio.h>
4
5 void swap(int* a, int* b){
6     int temp = *a;
7     *a = *b;
8     *b = temp;

```

```
    }
10
11 int main()
12 {
13
14     int n = 4;
15     int arr[4][4] = { { 1, 2, 3, 4 },
16                       { 5, 6, 7, 8 },
17                       { 9, 10, 11, 12 },
18                       { 13, 14, 15, 16 } };
19
20     // Print Original Matrix
21     printf("Original Matrix:\n");
22     for (int i = 0; i < n; i++) {
23         for (int j = 0; j < n; j++) {
24             printf("%d ", arr[i][j]);
25         }
26         printf("\n");
27     }
28
29     // Rotate the matrix about the main diagonal
30     for (int i = 0; i < n; i++) {
31         for (int j = 0; j < i; j++)
32             swap(&arr[i][j], &arr[j][i]);
33     }
34
35     // Rotate the matrix about middle column
36     for (int i = 0; i < n; i++) {
37         for (int j = 0; j < n / 2; j++) {
38             swap(&arr[i][j], &arr[i][n - j -
39 1]);
40         }
41
42     // Print the rotated matrix
43     printf("Matrix after rotation: \n");
44     for (int i = 0; i < n; i++) {
45         for (int j = 0; j < n; j++) {
46             printf("%d ", arr[i][j]);
47         }
48         printf("\n");
49     }
50 }
```

Output

Original Matrix:

```
1 2 3 4
5 6 7 8
9 10 11 12
13 14 15 16
```

Matrix after rotation:

```
13 9 5 1
14 10 6 2
15 11 7 3
16 12 8 4
```

32. Write a Program to find the Spiral Traversal of a Matrix in C.

C

```
1 // C Program to find Spiral Traversal
2 // Of a matrix
3 #include <stdio.h>
4
5 int main()
6 {
7     int arr[4][4] = { { 1, 5, 9, 13 },
8                       { 2, 6, 10, 14 },
9                       { 3, 7, 11, 15 },
10                      { 4, 8, 12, 16 } };
11
12     int m = 4, n = 4;
13     int i, l = 0, right = m - 1, begin = 0, end = m
14     - 1;
15     while (l <= right && begin <= end) {
16
17         // Print the first row
18         // from the remaining rows
19         for (i = l; i <= right; ++i) {
20             printf("%d ", arr[begin][i]);
21         }
22         begin++;
```

```
24         // Print the last column
25         // from the remaining columns
26         for (i = begin; i <= end; ++i) {
27             printf("%d ", arr[i][right]);
28         }
29         right--;
30
31         // Print the last row from
32         // the remaining rows
33         if (begin <= end) {
34             for (i = right; i >= l; --i) {
35                 printf("%d ", arr[end][i]);
36             }
37             end--;
38         }
39
40         // Print the first column from
41         // the remaining columns
42         if (l <= right) {
43             for (i = end; i >= begin; --i) {
44                 printf("%d ", arr[i][l]);
45             }
46             l++;
47         }
48     }
49
50     return 0;
51 }
```

Output

1 5 9 13 14 15 16 12 8 4 3 2 6 10 11 7

33. Write a program to count the sum of numbers in a string.

C

```
1 #include <stdio.h>
2
```

```
int main()  
4 {  
5  
6     char s[] = "124259";  
7  
8     int ans = 0;  
9     // iterate through all the number  
10    for (int i = 0; s[i] != '\0'; i++) {  
11        int ele = s[i] - 48;  
12        if (ele <= 9)  
13            ans += ele;  
14    }  
15  
16    // print sum of the numbers  
17    printf("%d", ans);  
18  
19    return 0;  
20 }
```

Output

23

34. Program to calculate the length of the string.

C

```
1 // C Program to calculate  
2 // length of a string  
3 #include <stdio.h>  
4 #include <string.h>  
5  
6 int length(char s[], int i)  
7 {  
8     if (s[i] == '\0')  
9         return 0;  
10  
11     return length(s, i + 1) + 1;  
12 }  
13
```



```
int main()  
15 {  
16     char s[] = "GeeksforGeeks";  
17  
18     // Calculating using strlen  
19     int len = strlen(s);  
20     printf("length using strlen:%d\n", len);  
21  
22     // Calculating using iteration  
23     int i;  
24     for (i = 0; s[i] != '\0'; i++) {  
25         continue;  
26     }  
27     printf("length using iteration:%d\n", i);  
28  
29     // Calculating using recursion  
30     int ans = length(s, 0);  
31     printf("length using recursion:%d\n", ans);  
32     return 0;  
33 }
```

Output

```
length using strlen:13  
length using iteration:13  
length using recursion:13
```

35. Write a program to check string is a palindrome.

C

```
 1 // C implementation to check if a given  
 2 // string is palindrome or not  
3 #include <stdio.h>  
4 #include <string.h>  
5 #include <stdbool.h>  
6  
7 bool is_palindrome(char* str, int i, int j)  
8 {  
9     if (i >= j) {
```

```
        return true;
11     }
12     if (str[i] != str[j]) {
13         return false;
14     }
15     return is_palindrome(str, i + 1, j - 1);
16 }
17
18 void check_palindrome(char* str)
19 {
20
21     // Start from leftmost and
22     // rightmost corners of str
23     int h = 0;
24     int flag = 0;
25     int l = strlen(str) - 1;
26
27     // Keep comparing characters
28     // while they are same
29     while (h < l) {
30         if (str[l++] != str[h--]) {
31             printf("%s is not a palindrome\n",
str);
32             flag = 1;
33             break;
34             // will break from here
35         }
36     }
37
38     if (flag == 0)
39         printf("%s is a palindrome\n", str);
40 }
41
42 int main()
43 {
44     char str[] = { "GeekeeG" };
45     char str2[] = { "GeeksforGeeks" };
46
47     check_palindrome(str);
48
49     printf("Checking %s using recursive
approach\n", str2);
50     bool ans =
is_palindrome(str2, 0, strlen(str2) - 1);
```

```
        if (ans)
52         printf("It is Palindrome\n");
53     else
54         printf("Not a Palindrome\n");
55
56     return 0;
57 }
```

Output



GeekeeG is a palindrome

Checking GeeksforGeeks using recursive approach

Not a Palindrome

36. Write a program to print all permutations of a given string in lexicographically sorted order in C.

C

```
 1 // C Program to print all permutations of a
    string in sorted
     2 // order.
3 #include <stdio.h>
4 #include <stdlib.h>
5 #include <string.h>
6
7 // function two compare two characters a and b
8 int compare(const void* a, const void* b)
9 {
10     return (*(char*)a - *(char*)b);
11 }
12
13 // function two swap two characters a and b
14 void swap(char* a, char* b)
15 {
16     char t = *a;
17     *a = *b;
18     *b = t;
19 }
20
```



```
// function finds the index of the smallest
character
22 int findCeil(char str[], char first, int l, int
h)
23 {
24     int ceilIndex = l;
25
26     for (int i = l + 1; i <= h; i++)
27         if (str[i] > first && str[i] <
str[ceilIndex])
28             ceilIndex = i;
29
30     return ceilIndex;
31 }
32
33 // Print all permutations of str in sorted
order
34 void sortedPermutations(char str[])
35 {
36     int size = strlen(str);
37
38     qsort(str, size, sizeof(str[0]), compare);
39
40     int isFinished = 0;
41     while (!isFinished) {
42         printf("%s \n", str);
43
44         int i;
45         for (i = size - 2; i >= 0; --i)
46             if (str[i] < str[i + 1])
47                 break;
48
49         if (i == -1)
50             isFinished = 1;
51         else {
52
53             int ceilIndex
54                 = findCeil(str, str[i], i + 1,
size - 1);
55             swap(&str[i], &str[ceilIndex]);
56             qsort(str + i + 1, size - i - 1,
sizeof(str[0]),
57                 compare);
58         }
59     }
```



```
    }  
61  
62 int main()  
63 {  
64     char str[] = "123";  
65     sortedPermutations(str);  
66     return 0;  
67 }
```

Output

```
123  
132  
213  
231  
312  
321
```

37. Write a program to calculate the Power of a Number using Recursion in C.

C

```
 1 // C program to calculate the Power of a Number  
using  
 2 // Recursion  
3 #include <stdio.h>  
4  
5 int power(int a, int b)  
6 {  
7     if (b == 0)  
8         return 1;  
9  
10    return power(a, b - 1) * a;  
11 }  
12  
13 int main()  
14 {  
15     int a = 4, b = 5;  
16
```



```
    int ans = power(a, b);  
18  
19    printf("%d", ans);  
20    return 0;  
21 }
```

Output

1024

38. Write a Code to print the Fibonacci series using recursion.

C

```
   
1 // C Program to illustrate  
2 // Fibonacci Series using Recursion  
3 #include <stdio.h>  
4  
5 int fibonacci(int n)  
6 {  
7     if (n <= 1)  
8         return n;  
9     return fibonacci(n - 1) + fibonacci(n - 2);  
10 }  
11  
12 int fibonacci_iteration(int n)  
13 {  
14     if (n <= 1)  
15         return 1;  
16  
17     int arr[n + 1];  
18     arr[0] = 1;  
19     arr[1] = 1;  
20  
21     for (int i = 2; i < n + 1; i++)  
22         arr[i] = arr[i - 1] + arr[i - 2];  
23  
24     return arr[n];  
25 }  
26
```

```
int main()  
28 {  
29     int n = 9;  
30     printf("Fibonacci using recursion of %d:%d\n",  
n,  
31         fibonacci(n));  
32  
33     n = 11;  
34     printf("Fibonacci using iteration of %d:%d", n,  
35         fibonacci_iteration(n));  
36     return 0;  
37 }
```



Output

Fibonacci using recursion of 9:34

Fibonacci using iteration of 11:144

39. Write a Program to find the HCF of two Numbers using Recursion.

C

```
 1 // C program to find  
 2 // GCD of two numbers  
3 #include <stdio.h>  
4  
5 // Recursive function to  
6 // Calculate and return gcd of a and b  
7 int gcd(int a, int b)  
8 {  
9     // Everything divides 0  
10    if (a == 0)  
11        return b;  
12    if (b == 0)  
13        return a;  
14  
15    // base case  
16    if (a == b)  
17        return a;
```

```
19     // a is greater
20     if (a > b)
21         return gcd(a - b, b);
22     return gcd(a, b - a);
23 }
24
25 int main()
26 {
27     int a = 192, b = 36;
28     printf("GCD of %d and %d is %d ", a, b, gcd(a,
29         b));
30     return 0;
31 }
```

Output

GCD of 192 and 36 is 12

40. Write a Program in C to reverse a string using recursion.

C

```
1 // C program to reverse
2 // String using recursion
3 #include <stdio.h>
4 #include <string.h>
5
6 // Using Iteration for reverse
7 void reverse_iteration(char* str)
8 {
9     int i = 0;
10    int j = strlen(str) - 1;
11
12    for (; i < j; i++, j--) {
13        char temp = str[i];
14        str[i] = str[j];
15        str[j] = temp;
16    }
17 }
18
```

```
// Using recursion for reverse
20 void reverse(char* str)
21 {
22     if (*str) {
23         reverse(str + 1);
24         printf("%c", *str);
25     }
26 }
27
28 int main()
29 {
30     char a[] = "Geeks for Geeks";
31     printf("Original string:%s\n", a);
32
33     reverse_iteration(a);
34     printf("Reverse the string(iteration):%s\n",
35 a);
36
37     printf("Using recursion for reverse:");
38     reverse(a);
39
40     return 0;
41 }
```

Output

Original string:Geeks for Geeks

Reverse the string(iteration):skeeG rof skeeG

Using recursion for reverse:Geeks for Geeks



41. Write a C Program to search elements in an array.

C

```
1 // C code to Search elements in array
2 #include <stdio.h>
3
4 int search(int arr[], int N, int x)
5 {
6     int i;
7
8     // iterate through all the element of array
9     for (i = 0; i < N; i++)
10         if (arr[i] == x)
11             return i;
12     return -1;
13 }
14
15 int main(void)
16 {
17     int arr[] = { 9, 3, 2, 1, 10, 4 };
18     int x = 10;
19     int N = sizeof(arr) / sizeof(arr[0]);
20
21     // Function Call
22     int result = search(arr, N, x);
23
24     if (result == -1) {
25         printf("Element is not present in array");
26     }
27     else {
28         printf("Element is present at index %d",
29             result);
30     }
31     return 0;
32 }
```

Output

Element is present at index 4

42. Write a C Program to search elements in an array using Binary Search.

C

```
1 // C program to Search element
2 // in Array using Binary Search
3 #include <stdio.h>
4
5 int binarySearch(int arr[], int l, int r, int x)
6 {
7     if (r >= l) {
8         int mid = l + (r - l) / 2;
9
10        // If the element is present at the middle
11        // itself
12        if (arr[mid] == x)
13            return mid;
14
15        // If element is smaller than mid, then
16        // it can only be present in left subarray
17        if (arr[mid] > x)
18            return binarySearch(arr, l, mid - 1, x);
19
20        // Else the element can only be present
21        // in right subarray
22        return binarySearch(arr, mid + 1, r, x);
23    }
24
25    return -1;
26 }
27
28 int main()
29 {
30     int arr[] = { 11, 14, 19, 23, 40 };
31     int n = sizeof(arr) / sizeof(arr[0]);
32     int x = 40;
```



```
int result = binarySearch(arr, 0, n - 1, x);
34  if (result == -1) {
35      printf("Element is not present in array");
36  }
37  else {
38      printf("Element is present at index %d",
result);
39  }
40  return 0;
41 }
```

Output

Element is present at index 4

43. Write a C Program to sort arrays using Bubble, Selection, and Insertion Sort.

C

```
1 // C Program to implement
2 // Sorting Algorithms
3 #include <stdio.h>
4
5 // A function to implement bubble sort
6 void bubble_sort(int* arr, int n)
7 {
8     for (int j = 0; j < n - 1; j++) {
9
10         // Last j elements are already in place
11         for (int i = 0; i < n - j - 1; i++) {
12             if (arr[i] > arr[i + 1]) {
13                 int temp = arr[i];
14                 arr[i] = arr[i + 1];
15                 arr[i + 1] = temp;
16             }
17         }
18     }
19 }
20
```

```
// A function to implement swapping
22 void swap(int* xp, int* yp)
23 {
24     int temp = *xp;
25     *xp = *yp;
26     *yp = temp;
27 }
28
29 // A function to implement selectionSort
30 void selectionSort(int arr[], int n)
31 {
32
33     // One by one move boundary of unsorted subarr
34     for (int i = 0; i < n - 1; i++) {
35         // Find the minimum element in unsorted
array
36         int min_idx = i;
37         for (int j = i + 1; j < n; j++)
38             if (arr[j] < arr[min_idx])
39                 min_idx = j;
40
41         // Swap the found minimum element
42         // with the first element
43         if (min_idx != i)
44             swap(&arr[min_idx], &arr[i]);
45     }
46 }
47
48 void insertionSort(int arr[], int n)
49 {
50
51     for (int i = 1; i < n; i++) {
52         int key = arr[i];
53         int j = i - 1;
54
55         // Move elements of arr that are
56         // greater than key, to one position ahead
57         // of their current position
58         while (j >= 0 && arr[j] > key) {
59             arr[j + 1] = arr[j];
60             j = j - 1;
61         }
62         arr[j + 1] = key;
63     }
```

```
    }  
65  
66 int main()  
67 {  
68     int arr1[] = { 9, 4, 3, 11, 1, 5 };  
69     int arr2[] = { 4, 3, 9, 1, 5, 11 };  
70     int arr3[] = { 5, 1, 11, 3, 4, 9 };  
71     int n = 6;  
72  
73     printf("Non-Sorted array: ");  
74     for (int i = 0; i < n; i++)  
75         printf("%d ", arr1[i]);  
76     printf("\n");  
77  
78     // sort array  
79     bubble_sort(arr1, n);  
80  
81     // printing array  
82     printf("Sorted array using Bubble sort: ");  
83     for (int i = 0; i < n; i++)  
84         printf("%d ", arr1[i]);  
85     printf("\n");  
86  
87     printf("Non-Sorted array: ");  
88     for (int i = 0; i < n; i++)  
89         printf("%d ", arr2[i]);  
90     printf("\n");  
91  
92     // sort array  
93     insertionSort(arr2, n);  
94  
95     // printing array  
96     printf("Sorted array using Insertion Sort: ");  
97     for (int i = 0; i < n; i++)  
98         printf("%d ", arr2[i]);  
99     printf("\n");  
100  
101     printf("Non-Sorted array: ");  
102     for (int i = 0; i < n; i++)  
103         printf("%d ", arr3[i]);  
104     printf("\n");  
105  
106     // sort array  
107     selectionSort(arr3, n);
```

```
109     // printing array
110     printf("Sorted array using Selection Sort: ");
111     for (int i = 0; i < n; i++)
112         printf("%d ", arr3[i]);
113     printf("\n");
114
115     return 0;
116 }
```

Output

Non-Sorted array: 9 4 3 11 1 5

Sorted array using Bubble sort: 1 3 4 5 9 11

Non-Sorted array: 4 3 9 1 5 11

Sorted array using Insertion Sort: 1 3 4 5 9 11

Non-Sorted array: 5 1 11 3 4 9

Sorted array using Selection Sort: 1 3 4 5 9 11

44. Write a C Program to sort arrays using Merge Sort.

C

```
1 // C program for
2 // Sorting array
3 // using Merge Sort
4 #include <stdio.h>
5
6 void merge(int arr[], int l, int m, int r)
7 {
8     int i, j, k;
9     int n1 = m - l + 1;
10    int n2 = r - m;
11
12    // create temporary arrays
13    int L[n1], R[n2];
14
15    // Copy data to arrays from L[] and R[]
16    for (i = 0; i < n1; i++)
17        L[i] = arr[l + i];
```

```

19         for (j = 0; j < n2; j++)
20             R[j] = arr[m + 1 + j];
21
22     // Initial index of first ,second
23     // and merged subarray respectively
24     i = 0;
25     j = 0;
26     k = l;
27     while (i < n1 && j < n2) {
28         if (L[i] <= R[j]) {
29             arr[k] = L[i];
30             i++;
31         }
32         else {
33             arr[k] = R[j];
34             j++;
35         }
36         k++;
37     }
38
39     // Copy the remaining elements of L[]
40     while (i < n1) {
41         arr[k] = L[i];
42         i++;
43         k++;
44     }
45
46     // Copy the remaining elements of R[]
47     while (j < n2) {
48         arr[k] = R[j];
49         j++;
50         k++;
51     }
52
53 void mergeSort(int arr[], int l, int r)
54 {
55     if (l < r) {
56
57         // calculating middle term
58         int mid = l + (r - l) / 2;
59
60         // divide to sort both halves
61         mergeSort(arr, l, mid);
```

```
        mergeSort(arr, mid + 1, r);
63
64        merge(arr, l, mid, r);
65    }
66 }
67
68 int main()
69 {
70     int arr[] = { 23, 9, 13, 15, 6, 7 };
71     int n = sizeof(arr) / sizeof(arr[0]);
72
73     // Printing original array
74     printf("Given array:");
75     for (int i = 0; i < n; i++)
76         printf("%d ", arr[i]);
77     printf("\n");
78
79     mergeSort(arr, 0, n - 1);
80
81     // Printing sorted array
82     printf("Sorted array :");
83     for (int i = 0; i < n; i++)
84         printf("%d ", arr[i]);
85     printf("\n");
86
87     return 0;
88 }
```



Output

Given array:23 9 13 15 6 7

Sorted array :6 7 9 13 15 23

45. Write a C Program to sort arrays using Quick Sort.

C

```
 1 // C Program for
 2 // sorting array using
3 // Quick sort
```

```
#include <stdio.h>

5
6 void swap(int* a, int* b)
7 {
8     int t = *a;
9     *a = *b;
10    *b = t;
11 }
12
13 int partition(int array[], int low, int high)
14 {
15     int pivot = array[high];
16
17     int i = (low - 1);
18
19     // compare elements with the pivot
20     for (int j = low; j < high; j++) {
21         if (array[j] <= pivot) {
22             i++;
23             swap(&array[i], &array[j]);
24         }
25     }
26
27     // swap the pivot element with the greater
    element at i
28     swap(&array[i + 1], &array[high]);
29
30     return (i + 1);
31 }
32
33 void quickSort(int array[], int low, int high)
34 {
35     if (low < high) {
36         int pi = partition(array, low, high);
37         quickSort(array, low, pi - 1);
38         quickSort(array, pi + 1, high);
39     }
40 }
41
42 void printArray(int array[], int n)
43 {
44     for (int i = 0; i < n; ++i) {
45         printf("%d ", array[i]);
46     }
```

```
        printf("\n");
48  }
49
50  int main()
51  {
52      int arr[] = { 28, 7, 20, 1, 10, 3 , 6 };
53
54      int n = sizeof(arr) / sizeof(arr[0]);
55
56      printf("Unsorted Array:");
57      printArray(arr, n);
58
59      quickSort(arr, 0, n - 1);
60
61      printf("Sorted array :");
62      printArray(arr, n);
63
64      return 0;
65  }
```



Output

Unsorted Array:28 7 20 1 10 3 6

Sorted array :1 3 6 7 10 20 28

46. Write a program to sort an array using pointers.

C

```
 1 // C Program to implement
 2 // sorting using pointers
3 #include <stdio.h>
4
5 // Function to sort the numbers using pointers
6 void sort(int n, int* ptr)
7 {
8     int i, j;
9
10    // Sort the numbers using pointers
11    for (i = 0; i < n; i++) {
```



```
13         for (j = i + 1; j < n; j++) {
14
15             if (*(ptr + j) < *(ptr + i)) {
16
17                 int temp = *(ptr + i);
18                 *(ptr + i) = *(ptr + j);
19                 *(ptr + j) = temp;
20             }
21         }
22     }
23
24     // print the numbers
25     for (i = 0; i < n; i++)
26         printf("%d ", *(ptr + i));
27 }
28
29 // Driver code
30 int main()
31 {
32     int n = 5;
33     int arr[] = { 13, 22, 7, 12, 4 };
34
35     sort(n, arr);
36
37     return 0;
38 }
```

Output

4 7 12 13 22

47. Write a C program to Store Information about Students Using Structure

C



```
1 // C Program to Store
2 // Information about Students
3 // Using Structure
```

```
#include <stdio.h>
5 #include <stdlib.h>
6 #include <string.h>
7
8 // Create the student structure
9 struct Student {
10     char* name;
11     int roll_number;
12     int age;
13 };
14
15 // Driver code
16 int main()
17 {
18     int n = 3;
19
20     // Create the student's structure variable
21     // with n Student's records
22     struct Student student[n];
23
24     // Get the students data
25     student[0].roll_number = 1;
26     student[0].name = "Geeks1";
27     student[0].age = 10;
28
29     student[1].roll_number = 2;
30     student[1].name = "Geeks2";
31     student[1].age = 11;
32
33     student[2].roll_number = 3;
34     student[2].name = "Geeks3";
35     student[2].age = 13;
36
37     // Printing the Structers
38     printf("Student Records:\n\n");
39     for (int i = 0; i < n; i++) {
40         printf("\tName : %s", student[i].name);
41         printf("\tRoll Number : %d",
42             student[i].roll_number);
43         printf("\tAge : %d\n", student[i].age);
44     }
45
46     return 0;
47 }
```

Output

Student Records:

Name : Geeks1	Roll Number : 1	Age : 10
Name : Geeks2	Roll Number : 2	Age : 11
Name : Geeks3	Roll Number : 3	Age : 13

48. Write a C Program To Add Two Complex Numbers Using Structures And Functions.

C

```
1 // C program to demonstrate
2 // addition of complex numbers
3 #include <stdio.h>
4
5 // define a structure for complex number
6 typedef struct complexNumber {
7     int real;
8     int img;
9 } complex;
10
11
12 complex add(complex x, complex y)
13 {
14     // define a new complex number.
15     complex add;
16
17     // add similar type together
18     add.real = x.real + y.real;
19     add.img = x.img + y.img;
20
21     return (add);
22 }
23
24 int main()
25 {
```

```
27     // define three complex type numbers
28     complex x, y, sum;
29
30     // first complex number
31     x.real = 4;
32     x.img = 5;
33
34     // second complex number
35     y.real = 7;
36     y.img = 11;
37
38     // printing both complex numbers
39     printf(" x = %d + %di\n", x.real, x.img);
40     printf(" y = %d + %di\n", y.real, y.img);
41
42     // call add(a,b) function and
43     // pass complex numbers a & b
44     // as an parameter.
45     sum = add(x, y);
46
47     // print result
48     printf("\n sum = %d + %di", sum.real,
49           sum.img);
50     return 0;
51 }
```

Output

x = 4 + 5i

y = 7 + 11i

sum = 11 + 16i

49. Write a C Program to add Two Distance Given as Input in Feet and Inches

C

```
// C program for calculating sum of
// Distance in inches and feet
#include "stdio.h"

// Struct defined for the inch-feet system
struct InchFeet {
    int feet;
    float inch;
};

// Function to find the sum of all N
// set of Inch Feet distances
void findSum(struct InchFeet arr[], int N)
{
    // Variable to store sum
    int feet_sum = 0;
    float inch_sum = 0.0;

    int x;

    // Traverse the InchFeet array
    for (int i = 0; i < N; i++) {
        // Find the total sum of
        // feet and inch
        feet_sum += arr[i].feet;
        inch_sum += arr[i].inch;
    }

    // If inch sum is greater than 11
    // convert it into feet
    // as 1 feet = 12 inch
    if (inch_sum >= 12) {
        // Find integral part of inch_sum
        x = (int)inch_sum;

        // Delete the integral part x
        inch_sum -= x;

        // Add x%12 to inch_sum
        inch_sum += x % 12;
    }
}
```

```
46         // Add x/12 to feet_sum
47         feet_sum += x / 12;
48     }
49     // Print the corresponding sum of
50     // feet_sum and inch_sum
51     printf("Feet Sum: %d\n", feet_sum);
52     printf("Inch Sum: %.2f", inch_sum);
53 }
54
55 int main()
56 {
57     struct InchFeet arr[]
58     = { { 11, 5.1 }, { 13, 4.5 }, { 6, 8.1 }
59 };
60     int N = sizeof(arr) / sizeof(arr[0]);
61
62     findSum(arr, N);
63
64     return 0;
65 }
```

Output

Feet Sum: 31

Inch Sum: 5.70

50. Write a C program to reverse a linked list iteratively

C

160 Days of DSA

C

C Basics

C Data Types

C Operators

C Input and Output

C Control Flow

C F



```
2 #include <stdio.h>
3 #include <stdlib.h>
4
5 /* Link list node */
6 struct Node {
7     int data;
8     struct Node* next;
9 };
```

```
11  /* Function to reverse the linked list */
12  static void reverse(struct Node** head_ref)
13  {
14      struct Node* prev = NULL;
15      struct Node* current = *head_ref;
16      struct Node* next = NULL;
17      while (current != NULL) {
18          // Store next
19          next = current->next;
20
21          // Reverse current node's pointer
22          current->next = prev;
23
24          // Move pointers one position ahead.
25          prev = current;
26          current = next;
27      }
28      *head_ref = prev;
29  }
30
31  /* Function to push a node */
32  void push(struct Node** head_ref, int new_data)
33  {
34      struct Node* new_node
35          = (struct Node*)malloc(sizeof(struct
36      Node));
37      new_node->data = new_data;
38      new_node->next = (*head_ref);
39      (*head_ref) = new_node;
40
41  /* Function to print linked list */
42  void printList(struct Node* head)
43  {
44      struct Node* temp = head;
45      while (temp != NULL) {
46          printf("%d ", temp->data);
47          temp = temp->next;
48      }
49  }
50
51  /* Driver code*/
52  int main()
```

```
    {  
54      /* Start with the empty list */  
55      struct Node* head = NULL;  
56  
57      push(&head, 10);  
58      push(&head, 14);  
59      push(&head, 19);  
60      push(&head, 25);  
61  
62      printf("Given linked list\n");  
63      printList(head);  
64      reverse(&head);  
65      printf("\nReversed linked list \n");  
66      printList(head);  
67      getchar();  
68  }
```

Output

Given linked list

25 19 14 10

Reversed linked list

10 14 19 25

Conclusion

In this C coding interview questions and answers, we've compiled a wide-range of practice questions suitable for individuals at all levels, from beginners to advanced learners. Exploring these questions and their solutions will not only enhance your proficiency in C but also prepare you for a successful coding interview experience.

C Coding Interview Questions – FAQs

Q: What are the most common C coding interview questions?

The most common C coding interview questions are designed to test your knowledge of the following topics:

- C syntax and semantics

- *Data structures and algorithms*
- *Memory management*
- *Pointers*
- *File I/O*

Some specific examples of common C coding interview questions include:

- *Reverse a linked list.*
- *Implement a binary search tree.*
- *Write a function to find the maximum element in an array.*
- *Explain the difference between a pointer and an array.*
- *What is the difference between a function declaration and a function definition?*
- *How do you allocate memory on the heap?*
- *How do you free memory that has been allocated on the heap?*
- *What is a dangling pointer?*
- *How do you read and write data to a file?*

Q. Who can benefit from these C coding interview questions and answers?

These questions are designed to benefit anyone preparing for a C coding interview. Whether you're a beginner looking to learn the fundamentals or an experienced programmer aiming to enhance your C skills, this resource can assist you in your preparation.

Q: How can I use these questions effectively in my interview preparation?

Start by assessing your current level of expertise in C programming language. Then, you can use these questions to gradually build your skills up and knowledge. Practice solving them on your own, and review the explanations to ensure a thorough understanding.

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