100 CODING CHALLENGES

for All Programing Languages

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Explore 100 coding challenges, covering arrays, strings, pointers, lists, algorithms, and data structures, to enhance and diversify your programming skills.

1. Write a code to add two numbers.
   - Input: 2, 3
   - Output: 5
2. Write a code to calculate the area of a rectangle (given length and width).
   - Input: Length: 4, Width: 5
   - Output: 20
3. Write a code to check if a number is even or odd.
   - Input: 7
   - Output: Odd
4. Write a code to convert Celsius to Fahrenheit.
   - Input: 25
   - Output: 77
5. Write a code to find the maximum of two numbers.
   - Input: 8, 12
   - Output: 12
6. Write a code to calculate the sum of digits in a number.
   - Input: 123
   - Output: 6
7. Write a code to check if a given year is a leap year.
   - Input: 2020
   - Output: Leap Year
8. Write a code to reverse a string.
   - Input: Hello
   - Output: olleH

9. Write a code to count the number of vowels in a string.
   - Input: Programming
   - Output: 3
10. Write a code to check if a given string is a palindrome.
   - Input: radar
   - Output: Palindrome
11. Write a code to calculate the factorial of a number.
   - Input: radar
   - Output: Palindrome
12. Write a code to find the average of three numbers.
   - Input: 10, 15, 20
   - Output: 15
13. Write a code to check if a given number is prime.
   - Input: 11
   - Output: Prime
14. Write a code to find the largest element in an array.
   - Input: [3, 7, 2, 10, 5]
   - Output: 10
15. Write a code to calculate the power of a number.
   - Input: 2, 3
   - Output: 8
16. Write a code to check if a string contains only digits.
   - Input: 12345
   - Output: True
17. Write a code to find the common elements between two arrays.
   - Input: [1, 2, 3, 4] and [3, 4, 5, 6]
   - Output: [3, 4]
18. Write a code to convert a binary number to decimal.
   - Input: 1101
   - Output: 13

19. Write a code to find the second largest element in an array.
    - Input: [8, 5, 12, 3, 10]
    - Output: 10
20. Write a code to reverse words in a sentence.
    - Input: Hello World
    - Output: World Hello
21. Write a code to check if a given string is an anagram.
    - Input: listen, silent
    - Output: Anagram
22. Write a code to calculate the Fibonacci sequence up to a given number of terms
    - Input: 6
    - Output: 0, 1, 1, 2, 3, 5
23. Write a code to find the GCD (Greatest Common Divisor) of two numbers.
    - Input: 24, 36
    - Output: 12
24. Write a code to find the smallest element in an array.
    - Input: [15, 8, 3, 10, 12]
    - Output: 3
25. Write a code to remove duplicates from an array.
    - Input: [1, 2, 2, 3, 4, 4, 5]
    - Output: [1, 2, 3, 4, 5]
26. Write a code to implement a simple calculator (addition, subtraction, multiplication, division).
    - Input: 5, +, 3
    - Output: 8
27. Write a code to find the area of a circle given its radius.
    - Input: Radius: 7
    - Output: 153.94 (approx)

28. Write a code to check if a given string is a valid email address.
    - Input: user@example.com
    - Output: Valid
29. Write a code to find the first non-repeating character in a string.
    - Input: programming
    - Output: o
30. Write a code to implement a basic stack (push, pop, and display).
    - Input: push(5), push(10), pop()
    - Output: 5
31. Write a code to determine if a given number is a perfect square.
    - Input: 16
    - Output: Perfect Square
32. Write a code to find the common characters between two strings.
    - Input: "hello", "world"
    - Output: "lo"
33. Write a code to implement a simple queue (enqueue, dequeue, and display).
    - Input: enqueue(3), enqueue(5), dequeue()
    - Output: 3
34. Write a code to calculate the sum of prime numbers up to a given limit.
    - Input: 10
    - Output: 17 (2 + 3 + 5 + 7)
35. Write a code to rotate an array to the right by a given number of steps.
    - Input: [1, 2, 3, 4, 5], 2
    - Output: [4, 5, 1, 2, 3]
36. Write a code to find the length of the longest consecutive sequence in an unsorted array.
    - Input: [100, 4, 200, 1, 3, 2]
    - Output: 4 (the sequence [1, 2, 3, 4])

37. Write a code to determine if a string is a valid palindrome ignoring non-alphanumeric characters.

- Input: "A man, a plan, a canal, Panama!"
- Output: Palindrome

38. Write a code to perform matrix multiplication.

- Input: [[2, 3], [4, 5]], [[1, 2], [3, 4]]
- Output: [[11, 16], [19, 28]]

39. Write a code to find the missing number in an array of consecutive integers.

- Input: [1, 2, 4, 5, 6]
- Output: 3

40. Write a code to implement a binary search algorithm.

- Input: Sorted array [1, 2, 3, 4, 5], Search element 3
- Output: Found at index 2

41. Write a code to print a right-angled triangle pattern.

Input: 5

Output:

```
*
**
***
****
*****
```

42. Write a code to print a pyramid pattern.

Input: 4

Output:

```
   *
  ***
 *****
*******
```

43. Write a code to print a hollow square pattern.

Input: 6

Output:

```
******
*    *
*    *
*    *
*    *
******
```

44. Write a code to print a diamond pattern.

Input: 3

Output:

```
  *
 ***
*****
 ***
  *
```

45. Write a code to print the Pascal's Triangle.

Input: 5

Output:

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

46. Write a code to print a mirrored right-angled triangle pattern.

Input: 4

Output:

```
****
 ***
  **
   *
```

47. Write a code to print a butterfly pattern.

Input: 3

Output:

```
*         *
**       **
***     ***
********
***     ***
**       **
*         *
```

48. Write a code to print an inverted pyramid pattern.

Input: 4

Output:

```
*******
 *****
  ***
   *
```

49. Write a code to print a zigzag pattern.

Input: 4

Output:

```
*     *
 *   *
  * *
   *
```

50. Write a code to print a spiral pattern.

Input: 3

Output:

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

51. Write a code to swap two numbers using pointers.
    - Input: a = 5, b = 10
    - Output: a = 10, b = 5
52. Write a code to find the length of a string using pointers.
    - Input: "programming"
    - Output: 11
53. Write a code to reverse an array using pointers.
    - Input: [1, 2, 3, 4, 5]
    - Output: [5, 4, 3, 2, 1]
54. Write a code to concatenate two strings using pointers.
    - Input: "Hello", " World"
    - Output: "Hello World"
55. Write a code to copy the content of one array to another using pointers.
    - Input: [2, 4, 6, 8]
    - Output: [2, 4, 6, 8] (new array)
56. Write a code to find the maximum element in an array using pointers.
    - Input: [7, 14, 3, 9, 5]
    - Output: 14
57. Write a code to reverse a linked list using pointers.
    - Input: 1 -> 2 -> 3 -> 4
    - Output: 4 -> 3 -> 2 -> 1
58. Write a code to delete a specific element from an array using pointers.
    - Input: [1, 2, 3, 4, 5], Element to delete: 3
    - Output: [1, 2, 4, 5]
59. *Write a code to sort an array using pointers.*
    - Input: [5, 2, 8, 1, 7]
    - Output: [1, 2, 5, 7, 8]

60. Write a code to dynamically allocate memory for an integer array and populate it with values.

- Input: Size: 3, Values: 10, 20, 30
- Output: Dynamic array: [10, 20, 30]

Certainly! Here are 10 coding challenges involving strings:

61. Write a code to find the length of a string without using standard library functions.

- Input: "programming"
- Output: 11

62. Write a code to concatenate two strings without using standard library functions.

- Input: "Hello", " World"
- Output: "Hello World"

63. Write a code to reverse a string without using standard library functions.

- Input: "algorithm"
- Output: "mhtirogla"

64. Write a code to check if a string is a palindrome.

- Input: "level"
- Output: Palindrome

65. Write a code to count the number of occurrences of a specific character in a string.

- Input: "programming", 'g'
- Output: 2

66. Write a code to convert a string to uppercase without using standard library functions.

- Input: "hello"
- Output: "HELLO"

67. Write a code to find the first non-repeating character in a string.

- Input: "repetition"
- Output: 'r'

68. Write a code to remove spaces from a string.

- Input: "Hello World"
- Output: "HelloWorld"

69. Write a code to replace a specific substring in a string.
    - Input: "I like cats.", Replace "cats" with "dogs"
    - Output: "I like dogs."
70. Write a code to check if two strings are anagrams.
    - Input: "listen", "silent"
    - Output: Anagrams
71. Write a code to find the sum of all elements in an array.
    - Input: [3, 7, 2, 8]
    - Output: 20
72. Write a code to calculate the average of an array of numbers.
    - Input: [10, 15, 20]
    - Output: 15
73. Write a code to check if a number is positive, negative, or zero.
    - Input: 5
    - Output: Positive
74. Write a code to find the square of a given number.
    - Input: 4
    - Output: 16
75. Write a code to determine the minimum of three numbers.
    - Input: 8, 3, 12
    - Output: 3
76. Write a code to print the multiplication table of a given number.
    - Input: 7
    - Output:

      7 x 1 = 7

      7 x 2 = 14

      ...

      7 x 10 = 70

77. Write a code to find the factors of a number.
    - Input: 12
    - Output: 1, 2, 3, 4, 6, 12
78. Write a code to calculate the power of a number using a loop.
    - Input: 2, 3
    - Output: 8
79. Write a code to find the absolute value of a number without using built-in functions.
    - Input: -9
    - Output: 9
80. Write a code to determine if a given year is a leap year using logical operators.
    - Input: 2024
    - Output: Leap Year
81. Write a code to find the sum of all elements in a list.
    - Input: [3, 7, 2, 8]
    - Output: 20
82. Write a code to calculate the average of a list of numbers.
    - Input: [10, 15, 20]
    - Output: 15
83. Write a code to find the maximum element in a list.
    - Input: [4, 9, 2, 12]
    - Output: 12
84. Write a code to count the occurrences of a specific element in a list.
    - Input: [1, 2, 3, 2, 4, 2, 5], Element: 2
    - Output: 3

85. Write a code to remove duplicates from a list.
    - Input: [1, 2, 2, 3, 4, 4, 5]
    - Output: [1, 2, 3, 4, 5]

86. Write a code to reverse a list.
    - Input: [3, 6, 9, 12]
    - Output: [12, 9, 6, 3]
87. Write a code to find the index of the first occurrence of a specific element in a list.
    - Input: [10, 15, 20, 15, 25], Element: 15
    - Output: 1
88. Write a code to check if a list is sorted in ascending order.
    - Input: [2, 5, 7, 10]
    - Output: Sorted
89. Write a code to find the common elements between two lists.
    - Input: [1, 2, 3, 4] and [3, 4, 5, 6]
    - Output: [3, 4]
90. Write a code to shift the elements of a list to the left by a given number of positions.
    - Input: [1, 2, 3, 4, 5], Shift: 2
    - Output: [3, 4, 5, 1, 2]
91. Write a code to find the second largest element in a list.
    - Input: [8, 5, 12, 3, 10]
    - Output: 10
92. Write a code to implement a basic stack (push, pop, and display).
    - Operations: push(5), push(10), pop()
    - Output: 5
93. Write a code to implement a basic queue (enqueue, dequeue, and display).
    - Operations: enqueue(3), enqueue(5), dequeue()
    - Output: 3
94. Write a code to check if a list is a palindrome.
    - Input: [1, 2, 3, 2, 1]
    - Output: Palindrome

95. Write a code to find the intersection of two lists.
    - Input: [1, 2, 3, 4] and [3, 4, 5, 6]
    - Output: [3, 4]
96. Write a code to find the union of two lists.
    - Input: [1, 2, 3, 4] and [3, 4, 5, 6]
    - Output: [1, 2, 3, 4, 5, 6]
97. Write a code to implement a binary search algorithm for a sorted list.
    - Input: Sorted list [1, 2, 3, 4, 5], Search element 3
    - Output: Found at index 2
98. Write a code to rotate a list to the right by a given number of steps.
    - Input: [1, 2, 3, 4, 5], 2
    - Output: [4, 5, 1, 2, 3]
99. Write a code to find the longest increasing subsequence in a list.
    - Input: [10, 22, 9, 33, 21, 50, 41, 60, 80]
    - Output: [10, 22, 33, 50, 60, 80]
100. Write a code to implement a basic linked list with insertion, deletion, and display operations.
    - Operations: insert(5), insert(10), delete(5), display()
    - Output: 10