Java Practice Programs
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Basics:
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1. Write a Java program to print "Hello, World!".
2. Write a Java program to find the sum of two numbers.
3. Write a Java program to swap two numbers without using a temporary variable.
4. Write a Java program to calculate the factorial of a number.
5. Write a Java program to check whether a number is prime or not.
6. Write a Java program to find the largest among three numbers.
7. Write a Java program to check whether a given character is a vowel or consonant.
8. Write a Java program to check whether a given string is a palindrome or not.
9. Write a Java program to calculate the area of a circle.
10. Write a Java program to generate Fibonacci series.

Control Flow and Loops:
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11. Write a Java program to print even and odd numbers between 1 to 100.
12. Write a Java program to display a pattern (e.g., pyramid) using nested loops.
13. Write a Java program to find the factorial of a number using recursion.
14. Write a Java program to implement the binary search algorithm.
15. Write a Java program to reverse a string.
16. Write a Java program to find the sum of digits of a number.
17. Write a Java program to print the Fibonacci series using recursion.
18. Write a Java program to find the GCD (Greatest Common Divisor) of two numbers.
19. Write a Java program to convert decimal to binary.
20. Write a Java program to find the factorial of a number using the do-while loop.

Arrays:
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1. Write a Java program to find the sum of elements in an array.
2. Write a Java program to find the largest element in an array.
3. Write a Java program to find the second largest element in an array.
4. Write a Java program to sort an array in ascending order.
5. Write a Java program to sort an array in descending order.
6. Write a Java program to find the intersection of two arrays.
7. Write a Java program to merge two sorted arrays.
8. Write a Java program to check if an array is palindrome or not.
9. Write a Java program to remove duplicates from an array.
10. Write a Java program to rotate an array to the left by N positions.
11. Write a Java program to rotate an array to the right by N positions.
12. Write a Java program to find the equilibrium index of an array.
13. Write a Java program to find the majority element in an array.
14. Write a Java program to find the maximum difference between two elements in an array.
15. Write a Java program to find the subarray with the maximum sum.
16. Write a Java program to find the subarray with the given sum.
17. Write a Java program to find the pair with the given sum in an array.
18. Write a Java program to reverse elements of an array.
19. Write a Java program to implement matrix multiplication.
20. Write a Java program to find the transpose of a matrix.

Strings:
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1. Write a Java program to check if a string is palindrome or not.
2. Write a Java program to reverse a string.
3. Write a Java program to check if two strings are anagrams of each other.
4. Write a Java program to find the first non-repeating character in a string.
5. Write a Java program to count vowels and consonants in a string.
6. Write a Java program to find the longest substring without repeating characters.

7. Write a Java program to check if a string contains only digits.
8. Write a Java program to convert the case of a string (uppercase to lowercase and vice versa).
9. Write a Java program to check if a string is a rotation of another.
10. Write a Java program to remove all duplicates from a string.
11. Write a Java program to count the occurrences of a character in a string.
12. Write a Java program to reverse words in a sentence.
13. Write a Java program to check if a string is a valid palindrome considering only alphanumeric characters.
14. Write a Java program to find the longest common prefix among an array of strings.
15. Write a Java program to check if a string contains a valid parentheses sequence.
16. Write a Java program to find all permutations of a string.
17. Write a Java program to find the shortest substring containing all characters of a given string.
18. Write a Java program to find the kth non-repeating character in a string.
19. Write a Java program to convert a string to its equivalent integer representation.
20. Write a Java program to remove all spaces from a string.

Collections:
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1. Write a Java program to demonstrate basic operations on ArrayList (add, remove, get).
2. Write a Java program to sort elements of an ArrayList in ascending order.
3. Write a Java program to find the intersection of two ArrayLists.
4. Write a Java program to merge two ArrayLists.
5. Write a Java program to remove duplicates from an ArrayList.
6. Write a Java program to reverse elements of an ArrayList.
7. Write a Java program to find the frequency of elements in an ArrayList.
8. Write a Java program to convert an ArrayList to an array.
9. Write a Java program to iterate over elements of an ArrayList using Iterator.
10. Write a Java program to convert an ArrayList to a LinkedList.
11. Write a Java program to demonstrate basic operations on LinkedList (add, remove, get).
12. Write a Java program to reverse elements of a LinkedList.
13. Write a Java program to find the intersection of two LinkedLists.
14. Write a Java program to merge two LinkedLists.
15. Write a Java program to remove duplicates from a LinkedList.
16. Write a Java program to find the frequency of elements in a LinkedList.
17. Write a Java program to convert a LinkedList to an array.
18. Write a Java program to iterate over elements of a LinkedList using ListIterator.
19. Write a Java program to convert a LinkedList to a HashSet.
20. Write a Java program to convert a LinkedList to a TreeSet.

Object-Oriented Programming (OOP) Concepts:
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31. Write a Java program to create a class representing a Circle with methods to calculate area and perimeter.
32. Write a Java program to create a class representing a Student with fields such as name, roll number, and marks in three subjects.
33. Write a Java program to demonstrate inheritance with a superclass and subclass.
34. Write a Java program to demonstrate encapsulation.
35. Write a Java program to demonstrate method overloading and method overriding.
36. Write a Java program to demonstrate the concept of abstraction with interfaces.
37. Write a Java program to create a class representing a Bank Account with methods for deposit, withdrawal, and balance inquiry.
38. Write a Java program to demonstrate the use of static keyword.
39. Write a Java program to implement a simple calculator using classes and objects.
40. Write a Java program to demonstrate the concept of polymorphism.

Exception Handling:
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41. Write a Java program to demonstrate the try-catch-finally block.
42. Write a Java program to handle ArrayIndexOutOfBoundsException.
43. Write a Java program to handle NullPointerException.
44. Write a Java program to demonstrate the use of custom exceptions.
45. Write a Java program to demonstrate throwing exceptions.

File Handling:
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46. Write a Java program to read and write text files.
47. Write a Java program to copy the contents of one file to another.
48. Write a Java program to merge two files.
49. Write a Java program to serialize and deserialize objects.
50. Write a Java program to read and write CSV files.

Multithreading:
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51. Write a Java program to create and run a simple thread.
52. Write a Java program to demonstrate synchronization in multithreading.
53. Write a Java program to use thread pools.
54. Write a Java program to implement the producer-consumer problem.
55. Write a Java program to implement the dining philosophers problem.

Matrices:
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56. Write a Java program to add two matrices.
57. Write a Java program to multiply two matrices.
58. Write a Java program to find the transpose of a matrix.
59. Write a Java program to check whether a matrix is symmetric or not.
60. Write a Java program to find the sum of each row and column of a matrix.

JDBC:
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61. Write a Java program to connect to a database.
62. Write a Java program to insert data into a database.
63. Write a Java program to retrieve data from a database.
64. Write a Java program to update data in a database.
65. Write a Java program to delete data from a database.

Collections Data Structures:
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66. Write a Java program to demonstrate ArrayList.
67. Write a Java program to demonstrate LinkedList.
68. Write a Java program to demonstrate HashMap.
69. Write a Java program to demonstrate TreeSet.
70. Write a Java program to demonstrate PriorityQueue.

Algorithms:
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71. Write a Java program to implement depth-first search (DFS).
72. Write a Java program to implement breadth-first search (BFS).
73. Write a Java program to implement Dijkstra's algorithm.
74. Write a Java program to implement the A* algorithm.
75. Write a Java program to implement bubble sort.