1. Write a program to reverse a string in Java.
2. Write a Java program to check if a string is a palindrome.
3. How to compare two strings in Java?
4. Write a Java program to find if two strings are anagrams.
5. Write a program to find the first occurrence of a substring in a string.
6. Write a Java program to find all occurrences of a character in a string.
7. How to extract a substring in Java?
8. Write a program to convert all characters of a string to uppercase.
9. Write a Java program to replace all occurrences of a character in a string.
10. How to split a string by a delimiter in Java?
11. How to remove leading and trailing whitespaces in Java?
12. Write a program to count the frequency of each character in a string.
13. How to check if a string contains only digits in Java?
14. Write a program to remove all vowels from a string.
15. How to reverse words in a string?
16. What is the difference between String, StringBuilder, and StringBuffer in Java?
17. Write a program to concatenate strings efficiently using StringBuilder.
18. Write a program to find the longest palindrome substring in a given string.
19. How do you find all permutations of a string?
20. Write a program to remove duplicates from a string.
21.  How do you check if a string starts with a specific prefix in Java?
22. Write a program to check if a string ends with a specific suffix.
23. Write a Java program to convert a string to a character array.
24. How to replace multiple spaces with a single space in a string?
25. Write a program to check if a string contains only alphabetic characters.
26. How to convert a string to a byte array and vice versa in Java?
27. Write a program to find the length of the longest word in a string.
28. How to find the number of words in a given string?
29. Write a program to capitalize the first letter of each word in a string.
30. How to check if two strings are rotations of each other?
31. Write a program to find the first non-repeated character in a string.
32. How to find the index of the last occurrence of a character in a string?
33. Write a program to sort the characters of a string in alphabetical order.
34. How to remove a specific character from a string without using replace()?
35. Write a program to check if two strings are one edit distance apart.
36. How to convert a string to a number without using built-in conversion functions?
37. Write a program to check if a string is a valid palindrome, ignoring spaces and punctuation.
38. How to count the occurrences of a word in a string?
39. Write a program to remove all occurrences of a substring from a string.
40. How to split a camel case string into individual words?
41. Write a program to reverse only the vowels in a string.
42. How to check if a string contains balanced parentheses?
43. Write a program to find the smallest window in a string containing all characters of another string.
44. How to count the number of vowels and consonants in a string?
45. Write a program to find all substrings of a string.
46. How to check if a string is a valid IPv4 address?
47. Write a program to find the longest common prefix among a group of strings.
48. How to check if a string contains duplicate characters?
49. Write a program to remove all digits from a string.
50. How to remove all non-alphabetic characters from a string ?
51. Write a program to reverse the order of words in a sentence without reversing the individual words.
52. How to find the longest substring without repeating characters in a string?
53. Write a program to find the second most frequent character in a string.
54. How to check if a string follows a specific pattern (e.g., "aabb")?
55. Write a program to check if a string contains a valid email address format.
56. How to check if two strings are isomorphic?
57. Write a program to find all palindromic substrings in a given string.
58. How to compress a string using the counts of repeated characters (e.g., "aaabb" -> "a3b2")?
59. Write a program to interleave two strings and form a single string (e.g., "abc" and "123" -> "a1b2c3").
60. How to check if a string can be rearranged to form a palindrome?
61. Write a program to perform basic string compression and decompression (e.g., Run-Length Encoding).
62. How to split a string into valid IP address parts (four octets)?
63. Write a program to count the number of substrings that are palindromes.
64. How to check if a string contains valid parentheses, brackets, and braces?
65. Write a program to find the length of the shortest word in a string.
66. How to find all possible rotations of a given string?
67. Write a program to find the longest repeating sequence in a string.
68. How to generate all possible subsets (power set) of characters in a string?
69. Write a program to count the number of valid anagrams of a string that can be made using its letters.
70. How to convert a Roman numeral string into an integer?
71. Write a program to find the minimum number of character deletions required to make two strings anagrams.
72. How to check if a string can be segmented into words from a dictionary?
73. Write a program to group anagrams from a list of strings.
74. How to find the longest string in an array that is a prefix of another string?
75. Write a program to evaluate a string-based mathematical expression (e.g., "3+5\*2").
76. How to find the shortest palindrome by appending characters to a string?
77. Write a program to convert a string from camel case to snake case and vice versa.
78. How to find the longest repeating non-overlapping substring in a string?
79. Write a program to replace all punctuation marks in a string with spaces.
80. How to find the longest string chain where each word differs by one letter?
81. Write a program to find the lexicographically smallest and largest substring of a given length.
82. How to determine if a string can be rearranged to form another given string (check for permutation)?
83. Write a program to calculate the edit distance (Levenshtein distance) between two strings.
84. How to find the smallest subsequence of a string that contains all characters of another string?
85. Write a program to convert a binary string to its decimal equivalent.
86. How to find the most frequent word in a string and its frequency?
87. Write a program to check if a string is a rotation of another string using only one call to a method.
88. How to check if a string contains only unique characters without using additional data structures?
89. Write a program to reverse only the consonants in a string, leaving the vowels intact.
90. How to check if a string contains all letters of the alphabet (pangram)?
91. Write a program to convert a string of digits into words (e.g., "123" -> "one two three").
92. How to find the minimum window substring that contains all the unique characters of a given string?
93. Write a program to generate all possible palindromic partitions of a given string.
94. How to check if a string is a valid hexadecimal number?
95. Write a program to count the number of characters that appear exactly twice in a string.
96. How to convert a string from kebab-case to camelCase?
97. Write a program to check if a string is a valid shuffle of two other strings.
98. How to check if two strings are k-anagrams (can be made into anagrams with at most k changes)?
99. Write a program to replace multiple consecutive occurrences of a character with a single instance.
    1. How to generate all possible strings of a given length from a set of characters?
100. Write a program to check if two strings differ by exactly one character.
101. How to find the longest subsequence common to two strings (Longest Common Subsequence)?
102. Write a program to determine the lexicographically next permutation of a given string.
103. How to check if a string contains equal numbers of two different characters (e.g., 'a' and 'b')?
104. Write a program to convert a given string into a zigzag pattern and read line by line.
105. How to find the shortest unique prefix for each string in a list of strings?
106. Write a program to determine the minimum number of swaps needed to make a string palindrome.
107. How to reverse a string without using any additional data structures (in-place)?
108. Write a program to group strings by their length in a list.
109. How to determine if a string is a subsequence of another string?
110. Write a program to encode a string using Huffman coding.
111. How to implement a custom function to convert an integer to a string without using inbuilt methods?
112. Write a program to rotate the characters in a string by a given number of positions (cyclic rotation).
113. How to find the first missing letter from a given range in an alphabetized string?
114. Write a program to count the number of palindromic subsequences in a string.
115. How to check if a string contains only valid JSON structure?
116. Write a program to reverse the words in a string while maintaining the order of punctuation.
117. How to convert a string from snake\_case to PascalCase?
118. Write a program to perform Caesar cipher encryption and decryption on a string.
119. How to find the longest alternating character sequence (e.g., "ababab") in a string?
120. Write a program to mask all digits in a string except the last four (e.g., "1234567890" -> "\*\*\*\*\*\*7890").
121. How to find the maximum number of overlapping substrings in a given string?
122. Write a program to check if a string can be divided into substrings where each part is a valid word.
123. How to detect if a string contains valid XML structure?
124. Write a program to return all the non-overlapping occurrences of a substring in a string.
125. How to check if two strings are cyclic permutations of each other?
126. Write a program to transform a string into its mirror image (e.g., 'a' -> 'z', 'b' -> 'y').
127. How to determine the longest substring that contains equal numbers of uppercase and lowercase letters?
128. Write a program to generate all possible strings of k length using a given set of characters.
     1. How to efficiently find the most frequent k-length substring in a string?
129. Write a program to generate the shortest string that contains all permutations of a given set of characters.
130. How to implement a string-based calculator supporting basic arithmetic and parentheses?
131. Write a program to convert an infix expression string to postfix notation.
132. How to find all k-length subsequences that are palindromes in a string?
133. Write a program to count the number of balanced substrings in a binary string (equal '0's and '1's).
134. How to find the longest prefix which is also a suffix of a given string?
135. Write a program to simulate and evaluate an expression with variables (e.g., "2a + 3b - 4").
136. How to implement a custom base conversion (e.g., converting a string from binary to hexadecimal)?
137. Write a program to find the shortest substring that can be rearranged to match another string.
138. How to check if a given string can be split into two equal halves that are anagrams of each other?
139. Write a program to check if a string contains valid HTML tags and nesting.
140. How to find the lexicographically smallest rotation of a string?
141. Write a program to count the number of substrings that contain all vowels exactly once.
142. How to find the minimum number of operations (insertions, deletions, replacements) to transform one string into another (edit distance with specific costs)?
143. Write a program to partition a string into the maximum number of parts where each part has unique characters.
144. How to find the number of distinct substrings of a string using suffix arrays?
145. Write a program to generate all Lyndon words of a given length from an alphabet.
146. How to check if two strings are almost identical (e.g., allow for two mismatches)?
147. Write a program to check if a string contains a valid time (e.g., "23:59", "12:00 PM").
148. How to find the longest suffix of a string that is also a prefix of another given string?
149. Write a program to find the maximum length of a substring without repeating characters using sliding window technique.
150. How to find the smallest window in a string that contains all distinct characters of another string (minimum window substring)?
151. Write a program to determine if a string is a valid permutation of a palindrome.
152. How to count the number of unique substrings in a given string?
153. Write a program to encode a string using a custom substitution cipher.
154. How to check if a string can be partitioned into substrings where each substring is a valid word from a dictionary?
155. Write a program to find the longest substring with at most k distinct characters.
156. How to find the number of different possible strings that can be formed by rearranging the characters of a given string?
157. Write a program to generate all combinations of a given string with a specific length.
158. How to determine the longest sequence of consecutive characters in a string?
159. Write a program to determine the maximum number of substrings that can be formed from a string where each substring is a valid word in a dictionary.
160. How to find the longest substring that can be obtained by removing exactly one character from a given string?
161. Write a program to find the number of distinct palindromic substrings in a string.
162. How to detect if a string is a valid UUID (Universally Unique Identifier)?
163. Write a program to identify and extract all potential hashtags from a string of text.
164. How to implement a custom string similarity algorithm based on Jaccard index or Cosine similarity?
165. Write a program to parse and validate a string representing a complex mathematical expression with nested parentheses.
166. How to determine if a string can be divided into k segments such that each segment is a palindrome?
167. Write a program to encode and decode a string using Base64 encoding.
168. How to find the longest substring that consists of exactly two distinct characters?
169. Write a program to find the minimum number of character edits required to make a string a valid anagram of another string (with specific constraints).
170. How to implement a suffix tree for efficient substring searching and pattern matching?
171. Write a program to find all possible ways to split a string into palindromic substrings.
172. How to detect and handle cyclic dependencies in a set of string patterns or configurations?
173. Write a program to determine the maximum number of overlapping substrings that can be extracted from a given string.
174. How to check if a string can be transformed into a valid JSON object with additional constraints?
175. Write a program to parse and validate custom date formats from a string (e.g., "dd/mm/yyyy", "yyyy-mm-dd").
176. How to generate and count all distinct substrings of a given length from a string?
177. Write a program to encode a string using a custom encryption algorithm with multiple keys.
178. How to find the longest substring with a sum of character values (converted to integers) that is divisible by a given number?
179. Write a program to determine the longest repeating substring in a string where substrings are considered identical only if they appear more than once.
180. How to implement a custom string matching algorithm with specific heuristics for pattern matching?
181. Write a program to generate all possible substrings that match a given regular expression.
182. How to find the longest substring where each character occurs a specific number of times?
183. Write a program to detect and count all unique substrings that are anagrams of each other.
184. How to check if a string can be segmented into a space-separated sequence of one or more dictionary words (word break problem)?
185. Write a program to extract and validate all possible valid phone numbers from a string.
186. How to calculate the longest common substring between multiple strings using dynamic programming?
187. Write a program to encode a string using a combination of different encryption algorithms and decode it.
188. How to find all substrings of a given string that are also substrings of another string?
189. Write a program to find the minimum number of characters to insert into a string to make it a palindrome.
190. How to implement and use a **trie** data structure for efficient prefix-based search and retrieval in a set of strings?
191. Write a program to extract all possible non-overlapping valid URLs from a string.
192. How to use **dynamic programming** to solve the problem of finding the longest common subsequence among multiple strings?
193. Write a program to identify and handle **string-based SQL injection vulnerabilities** in a set of query strings.
194. How to develop a **finite automaton** for recognizing valid sequences of characters in a string?
195. Write a program to count the number of ways to partition a string into distinct substrings.
196. How to apply **Boyer-Moore** or **Knuth-Morris-Pratt** algorithm to search for patterns in very large strings efficiently?
197. Write a program to compute the **suffix array** and **longest common prefix (LCP) array** for a given string.
198. How to design and implement a custom **string compression** algorithm optimized for specific types of data?