

1. Given a string s, find the length of the longest substring without repeating characters.

Input: s = "abcabcbb"

Output: 3

Explanation: The answer is "abc", with the length of 3.

Answer Explanation

This Java code defines a program that calculates the length of the longest substring within a given input string that contains distinct characters. The code uses a brute-force approach to find all possible substrings and checks each substring for distinct characters.

Step 1:

These are the standard import statements that are used to access various classes and methods defined in the Java libraries.

Step 2:

"Main", this is the entry point of the program. The main method reads an input string from the user using the Scanner class, creates an instance of the Main class, and then calls the length method on that instance to compute the length of the longest substring with distinct characters.

Step 3:

The length method takes an input string s and calculates the length of the longest substring with distinct characters using a brute-force approach. It uses two nested loops to iterate through all possible substrings of the input string. The outer loop (controlled by the variable i) determines the starting index of the substring. The inner loop (controlled by the variable j) determines the ending index of the substring.

For each substring, the check method is called to determine whether the characters in the substring are distinct. If the characters are distinct, the length of the current substring is calculated ($j - i + 1$), and if this length is greater than the previously calculated length (a), it updates the a variable.

Step 4:

The check method takes an input string `s` and the start and end indices of a substring. It uses an integer array `chars` to keep track of the frequency of characters in the current substring. It iterates through the characters in the substring and updates the frequency count in the `chars` array. If the count of any character becomes greater than 1, it means the character is repeated, and the method returns `false`, indicating that the substring does not contain distinct characters.

Execution of a sample program:

When the program is executed, it prompts the user to enter a string. After receiving the input string, it calculates the length of the longest substring with distinct characters using the `length` method and displays the result.