



**Aror University of Art, Architecture, Design &
Heritage Sukkur**

Department of AI-Multimedia and Gaming

BS-AI and MMG, Fall 2024 Batch

_____ Lab 09: String and Random classes in java Course: Object
Oriented Programming

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1. **Reverse a String**

Write a method `reverseString(String str)` that returns the reverse of the input string without using built-in reverse methods (e.g., `StringBuilder.reverse()`).

Sample Input: "hello" → *Output:* "olleh"

2. **Check Palindrome**

Write a method `isPalindrome(String str)` that returns true if the string is a palindrome (ignoring case and non-alphanumeric characters).

Sample Input: "A man, a plan, a canal: Panama" → *Output:* true

3. **Longest Substring Without Repeating Characters**

Write a method `longestUniqueSubstring(String str)` that returns the length of the longest substring without repeating characters.

Sample Input: "abcabcbb" → *Output:* 3 (substring "abc").

4. **Count Vowels and Consonants**

Write a method `countVowelsAndConsonants(String str)` that prints the number of vowels and consonants (ignoring non-letter characters).

Sample Input: "Hello World!" → *Output:* Vowels: 3, Consonants: 7.

5. **Random Prime Number**

Write a method `generateRandomPrime(int min, int max)` that returns a random prime number within [min, max].

Sample Input: min=10, max=20 → *Possible Output:* 11, 13, etc.

6. **Generate 100 random integers between 0 and 20 using a loop. Count and print the frequency of each unique generated number.**

Number 0: 5 times

Number 3: 12 times

...

Number 20: 8 times