**LAB-MID**

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**Q1: Briefly describe the regex library of C#.**

**Ans:**

**1. Namespace and Class**

**Namespace:** System.Text.RegularExpressions

**Main Class:** Regex

**2. Pattern Matching**

**Pattern:** A regular expression pattern is used to define a search or match criteria.

**3. Core Functions**

**Match:** The `Regex.Match` method is used to find the first match of a regular expression pattern in a string.

**Matches**: The `Regex.Matches` method returns all matches of a regular expression pattern in a string as a collection.

**Replace**: The `Regex.Replace` method is used to replace matches of a regular expression pattern with a specified replacement string.

**Split:** The `Regex.Split` method splits a string into an array of substrings based on a regular expression pattern.

**4. Regular Expression Options**

Regular expressions in C# support various options, such as case-insensitive matching, multi-line matching, and more. These can be set using the RegexOptions enumeration.

**5. Groups and Captures**

Regular expressions can define capturing groups, and the `Match` object allows access to these groups and their captures.

**6. Examples**

Example code snippets demonstrating how to use regular expressions in C# for common tasks, such as email validation, extracting data, and more.

**7. Error Handling**

Exception handling for handling regular expression-related errors, such as invalid patterns.

**8. Performance Considerations**

Information on optimizing regular expressions for performance, including tips on avoiding backtracking and catastrophic backtracking.

**9. Best Practices**

Recommendations and best practices for using regular expressions effectively and efficiently in C# applications.

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