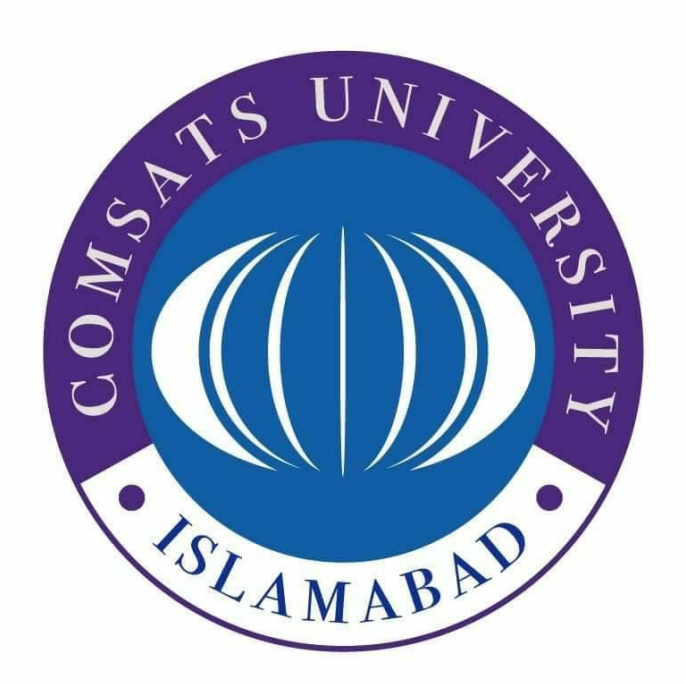

Group Members

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Submitted To: Sir Bilal Haider Bukhari

Date of Submission: 28-Dec-2023

Lab Terminal

Question 1: Brief/Objective of the project:

The goal of this project is to design and implement a compiler that performs both lexical and semantic analysis for a programming language using the C# programming language. The compiler will be responsible for translating high-level source code into an intermediate representation, paving the way for subsequent stages of compilation.

Lexical Analysis:

Develop a lexical analyzer using regular expressions and finite automata.

Tokenize source code, handling keywords, identifiers, literals, operators, etc.

Generate a token stream for the next compiler stages.

Semantic Analysis:

Construct a symbol table for managing identifier information.

Implement type checking for operand and expression compatibility.

Detect and report semantic errors, handle scoping rules, and manage variable lifetimes.

Syntax Analysis:

If needed, implement a syntax analyzer using context-free grammars and parsing techniques.

Verify the syntactic correctness of the source code.

Error Handling:

Develop a robust error-handling mechanism for meaningful error messages.

Implement error recovery strategies to handle compilation errors gracefully.

Documentation and Testing:

Provide comprehensive documentation covering design decisions, algorithms, and user guidelines.

Create a suite of test cases for thorough validation of compiler correctness and performance.

User Interface (optional):

Develop a simple user interface or command-line interface for user interaction.

Allow users to input source code files and receive compiled output.