**SPL-1 Project Proposal Form, 2023**

**Institute of Information Technology (IIT)**

**University of Dhaka**

| **Student’s Name:** | | Salsabila Zaman | | |
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| **Project Description:**  The Numerical Operations Library is an ambitious and innovative project that seeks to develop a comprehensive and user-friendly software package catering to the needs of number theorists, mathematicians, researchers, and students. It will offer essential tools and algorithms for exploring prime numbers, factorization, modular arithmetic, and other fundamental concepts in number theory. The library will also feature matrix calculations with an intuitive graphical interface, allowing users of all proficiency levels to interact effortlessly with its functionalities. User will have an interactive interface where he/she’ll be able to do the following set of works-   1. Prime Numbers(Check if a number is prime,Prime generation) 2. Prime Factorization 3. Modular Arithmetic 4. Digit Manipulations(Digit Summation,Digit Reversal,Palindrome Check) 5. Divisors 6. Greatest Common Divisor (GCD) 7. Least Common Multiple (LCM) 8. Fibonacci Sequences   Specialization (Matrix Manipulation)-   1. Matrix Addition 2. Matrix Multiplication 3. Matrix Determinant 4. Matrix Inversion 5. Matrix Power Calculation 6. Matrix Transposition 7. Matrix eigenvalues and eigenvectors 8. Check Matrix Types | | | | |
| **Languages or Tools to be used:** C,C++ | | | | |
| **Supervisor’s Name:\_\_Associate Prof. Abdus Satter\_\_\_\_\_\_\_**  **Signature of the supervisor:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | | | |