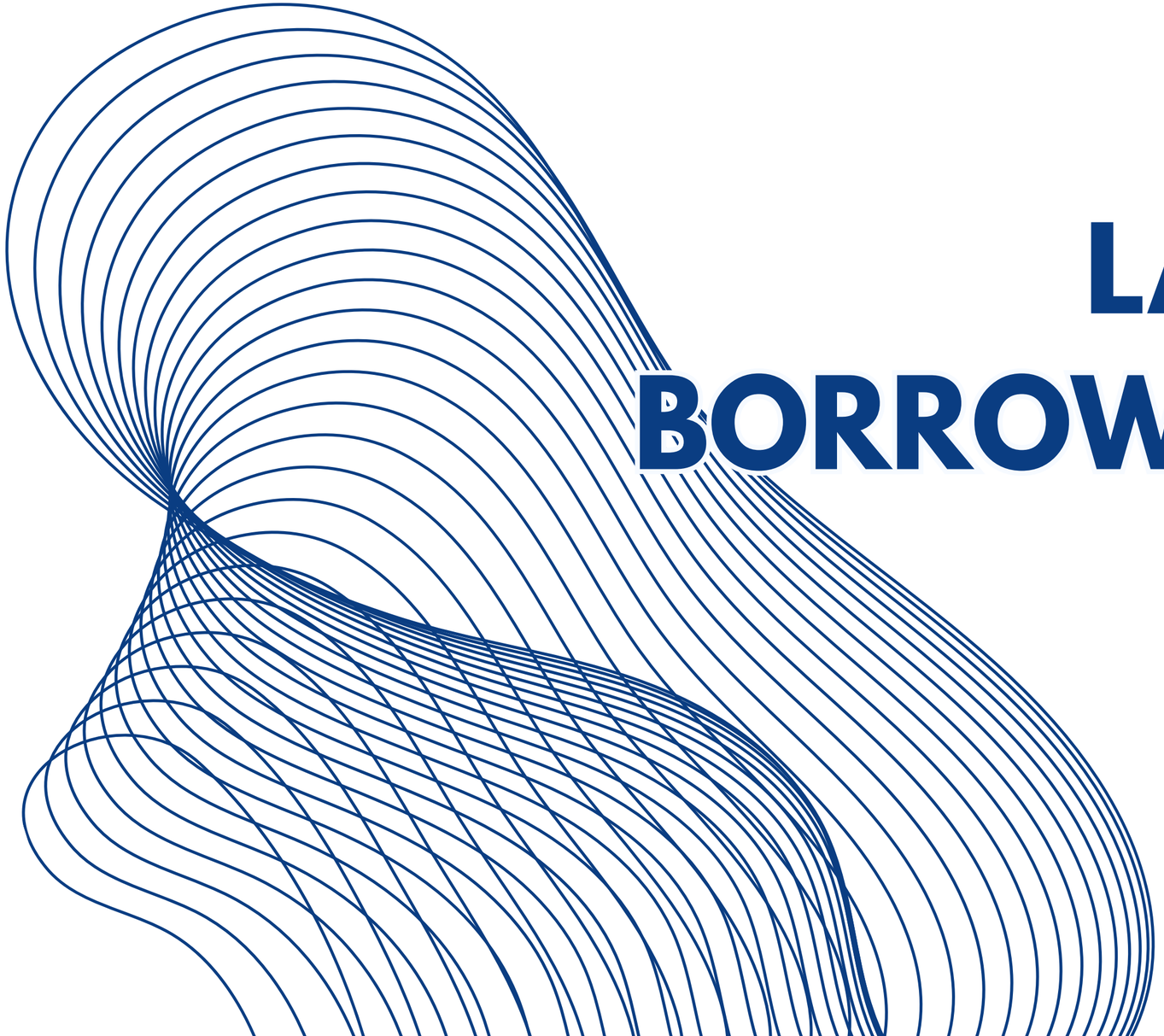

LAB MATERIALS BORROWING MANAGER

Using **Queues**

1. OBJECTIVES(S)

GENERAL OBJECTIVE:

- Follow a specific data structure to be implemented:
  - Queues
- The created output can be related to Computer Engineering

SPECIFIC OBJECTIVE:

- The program will be done using C++ programming language
- The program will utilize queues as the data structure for processing the borrower's request
- The interface of the program and its output will be in a Console window

2. INTENDED LEARNING OUTCOMES (ILOS)

- Develop a Console-Based Application
- Gain experience with file handling for data storage
- Learn to manage and process user requests using queues

3. DISCUSSION

I. BACKGROUND AND CONCEPTS

- This program simplifies managing laboratory materials by tracking items and allowing students to borrow them easily. It ensures accurate inventory and equal access for all students.
- The program uses queues as the data structure to handle the requests of the students to borrow materials in a FIFO (First In, First Out) basis.
- The program outputs in a terminal window
- Libraries used:
  - <iostream>: For input and output operations.
  - <fstream>: For file input and output operations.
  - <sstream>: For string stream operations which allows to format strings.
  - <map>: For storing key-value pairs.
  - <vector>: For changing the size dynamically.
  - <string>: For string operations which are sequence of characters
  - <queue>: For queue operations to showcase FIFO concept

3. DISCUSSION

II. SCOPE AND LIMITATIONS

- **Scope**
  - The program lets students register, log in, and request lab materials. Admins manage materials and approve or deny requests. Data is stored in text files for persistence.

- **Limitations**
  - It uses text files, causing potential issues with multiple users. Only one admin is supported, with basic login and no strong security. Materials are not reserved in real-time, and there's no graphical user interface.

4. MATERIALS AND EQUIPMENT

- A computer or laptop with an operating system that supports C++ development (Windows, macOS, or Linux)
- A C++ compiler with version (C++11 or later) such as:
  - GCC (GNU Compiler Collection)
  - Clang
  - Microsoft Visual C++ (MSVC)
- An IDE such as:
  - Visual Studio Code (VSCode - Follow VSCode documentation on how to setup C++)
  - CLion
  - Code Blocks
  - Visual Studio
  - Embarcadero DevC++

5. PROCEDURE

- **ILO A:** Develop a console based application
- **ILO B:** Gain experience in file handling for data storage
- **ILO C:** Learn to manage and process request using queues

All Intended Learning Outcomes (ILOs) have been successfully achieved.

5. PROCEDURE

1.) Include the necessary head files for the program and use the standard namespace

2.) Create the Materials Class

- For handling the names and quantity

3.) Create Account Manager Class

- For handling account information and storing into a .txt file

4.) Create Database Manager Class

- For handling materials information and store it into a .txt file

5.) Create Borrowing Request Class

- For handling borrowing requests of the students

6.) Create the Borrowing App Class

- For handling the different functionalities of the program and the formatting of the output in the console window

6. OUTPUT

7. CONCLUSION

- The program successfully meets the outlined objectives by implementing a comprehensive borrowing system for laboratory materials

- The program effectively demonstrated the concept of queues through the processing of the borrower's request using the C++ programming language

- The created program and its outputs were also successfully operated using a console window

8. RECOMMENDATIONS

- Implement better security enhancements
- Enhance user experience improvements
- Possible implementation of an option when students will return materials
- Implement a backup and recovery mechanism to protect against sudden data losses

MEMBERS:

JAMES RUSSEL ADIA

CARL JERVIE CARAG

MARK JEONEL KENN GOB

DANICA GUARIÑO

ARIES RIO

THANK YOU