

Assignment I: Library Management System

Student Name: _____

Student ID: _____

Instructions:

You are required to implement a simple Library Management System using Object-Oriented Programming (OOP) principles in C++.

Your program should:

- Define classes for **Book**, **Member**, and **Library**.
- Allow adding new books and members to the library.
- Implement functionality for borrowing and returning books.
- Ensure that a book cannot be borrowed if it is already checked out.
- Display the list of available books and the borrowing status.
- Use appropriate methods and attributes for each class.
- Demonstrate encapsulation, inheritance (if applicable), and other OOP concepts.

Submission Requirements:

- Include your well-commented source code in the report.
- Provide sample test cases and their outputs.
- Briefly explain your design choices and how OOP principles are applied.
- Ensure your code is well-structured and follows best practices.

A Introduction

This document illustrates how to use the provided LaTeX class and environments for your programming assignment submissions. Use the `codelisting` environment for your code, and the `testcase` environment for worked examples.

B Sample Code Listing

Below is an example of how to include C++ code in your report:

```
// Example: Hello World in C++
#include <iostream>
using namespace std;

int main() {
    cout << "Hello, world!" << endl;
    return 0;
}
```

C Test Cases

Here are some sample test cases you can include in your report:

Test Case: Swapping Two Numbers in C++

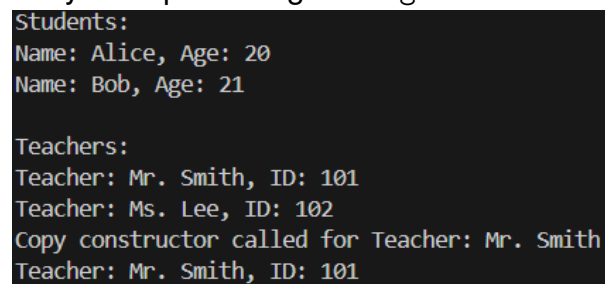
```
int a = 5, b = 10;
swap(a, b);
cout << "a=" << a << ", b=" << b << endl;
\end{codelisting }
```

Output:

```
\begin{codelisting}
a = 10, b = 5
\end{codelisting}
```

D Inserting Figures

You can include figures in your report using the `figure` environment. Here is an example:



```
Students:
Name: Alice, Age: 20
Name: Bob, Age: 21

Teachers:
Teacher: Mr. Smith, ID: 101
Teacher: Ms. Lee, ID: 102
Copy constructor called for Teacher: Mr. Smith
Teacher: Mr. Smith, ID: 101
```

Figure 1: Sample Image