Week 11: Revision

`W11_Revision_Project.cpp`

Objective: Combine all learned concepts into a single small project. **Task:** Create a simple command-line Student Roster.

1. **Class:** Create a `Student` class with `name` (string) and `studentID` (int) as private attributes.
2. **Collection:** In `main()`, create a `std::vector<Student>` to hold all the student objects.
3. **Functions:** Create functions to `addStudent()` and `printRoster()`.
4. **Control Flow:** Use a `while` loop to create a main menu that lets the user choose to add a student, print the roster, or exit. Use a `switch` or `if-else` statement to handle the user's choice.

Solution:

C++

```
#include <iostream>

#include <string>

#include <vector>


// 1. The Student class

class Student {

public:

   // Constructor

   Student(std::string studentName, int id) : name(studentName), studentID(id) {}


   // Public method to print student details

   void printDetails() const { // 'const' means this method doesn't change the object

      std::cout << "ID: " << studentID << ", Name: " << name << std::endl;

   }


private:

   std::string name;

   int studentID;

};
```

```
// 3. Helper functions
void printRoster(const std::vector<Student>& roster) {
    if (roster.empty()) {
        std::cout << "Roster is currently empty." << std::endl;
        return;
    }
    std::cout << "\n--- Student Roster ---" << std::endl;
    for (const auto& student : roster) {
        student.printDetails();
    }
    std::cout << "----------------------" << std::endl;
}

void addStudent(std::vector<Student>& roster) {
    std::string name;
    int id;

    std::cout << "Enter new student's name: ";
    std::cin.ignore(); // Clears the input buffer before getline
    std::getline(std::cin, name);

    std::cout << "Enter new student's ID: ";
    std::cin >> id;

    roster.push_back(Student(name, id));
    std::cout << "Student added successfully." << std::endl;
}

int main() {
    // 2. Collection to store students
```

```
    std::vector<Student> studentRoster;
    int choice = 0;

    // 4. Main menu loop
    while (choice != 3) {
        std::cout << "\n--- Main Menu ---" << std::endl;
        std::cout << "1. Add Student" << std::endl;
        std::cout << "2. Print Roster" << std::endl;
        std::cout << "3. Exit" << std::endl;
        std::cout << "Enter your choice: ";
        std::cin >> choice;

        switch (choice) {
            case 1:
                addStudent(studentRoster);
                break;
            case 2:
                printRoster(studentRoster);
                break;
            case 3:
                std::cout << "Exiting program. Goodbye!" << std::endl;
                break;
            default:
                std::cout << "Invalid choice. Please try again." << std::endl;
        }
    }

    return 0;
}
```