C++ Class Practice Problems

Class Member Access

Problem 1: BookShelf (Difficulty: 1)

Create a class `BookShelf` with a `std::vector<std::string>` of titles.

Write public methods to:

- Add a book

- Print all books

Problem 2: Employee (Difficulty: 2)

Create a class `Employee` with private members: `string name`, `int id`, and `double salary`.

Write:

- A constructor to set the name, id, and salary

- A public method `printInfo()` that prints all three

Types of Constructors

Problem 3: Point (Difficulty: 2)

Create a class `Point` with members `x` and `y`.

Implement:

- A default constructor that sets both to `0`

- A parameterized constructor to set custom values

Problem 4: Product (Difficulty: 3)

Create a class `Product` with name and price.

Implement:

- A default constructor (sets to "Unknown", 0.0)

- A parameterized constructor

- A copy constructor that duplicates an existing Product

Reference Operators

Problem 5: BankAccount (Difficulty: 2)

Create a class with `balance`.

Write a method `void deposit(const double& amount)` that adds to balance.

Print balance using a `print()` method.

Problem 6: NumberHolder (Difficulty: 3)

Create a class that holds a `std::vector<int>`.

Write:

- A method that takes `const std::vector<int>&` to load data

- A method that returns a reference to the vector:

```cpp
std::vector<int>& getNumbers();
```

Implementing Functions Separately

Problem 7: Rectangle (Difficulty: 2)

Create a class `Rectangle` with `width` and `height`.

Declare methods in the `.h` file:

- `double area()`

- `void setDimensions(int w, int h)`

Define them separately in a `.cpp` file.

Problem 8: Library (Difficulty: 4)

Create a class `Library` with `std::map<std::string, int>` for books and counts.

Implement all functions (addBook, removeBook, printBooks) in a separate `.cpp` file.

Use header guards in the `.h` file.