Lab 6

Problem 1:

Question 1:

You are working on a C++ program to manage student records.

Define a class `Student` with a member function named `setStudentData` that takes three parameters: student name, roll number, and age. Inside the function, set the class's private member variables to the values provided as arguments. Then, create an instance of the `Student` class, call the `setStudentData` function with sample data, and demonstrate how to access and print the student's information using a separate member function.

```
Creating a student with the name 'Weston Shakespear', the roll number '5', and the age of '25'
Created a student with the name 'Weston Shakespear', the roll number '5', and the age of '25'
```

Question 2:

You are tasked with developing a banking system in C++.

Create a class `BankAccount` with member functions for deposit and withdrawal, both taking an amount as a parameter. Implement these functions to update the account balance accordingly. Also, include a member function `getBalance` that returns the current balance. Create an instance of the `BankAccount` class, demonstrate how to make deposits and withdrawals, and show the account balance after several transactions.

```
Created a BankAccount with $30 in it
Depositing 15.64
Withdrawing 7.82
Total funds: $37.82Depositing 7.82
Withdrawing 3.91
Depositing 3.91
Withdrawing 1.955
Total funds: $43.685
```

Question 3:

Create a C++ class called Book to represent a book. The class should have private data members for the book's title, author, and publication year. Define the following member functions for the Book class:

setBookInfo(string title, string author, int year) to set the book's title, author, and publication year.

getBookInfo() to return a string that contains the book's title, author, and publication year as a formatted string.

isPublishedBefore(int year) to check if the book was published before the given year. It should return true or false.

In the main function, create an instance of the Book class, set the book's information, and display the book's details. Then, check if the book was published before a specific year and print the result.

```
Creating the book by 'Weston Shakespear' called 'Introduction to Watching Paint Dry' and released in 2034
The book string is: 'Introduction to Watching Paint DryWeston Shakespear 2034'
The book was published before 2039
```

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Question 4:

Design a C++ class called Rectangle to represent a rectangle. The class should have private data members for the length and width of the rectangle. Define the following member functions for the Rectangle class:

setDimensions(double length, double width) to set the length and width of the rectangle.

calculateArea() to calculate and return the area of the rectangle.

calculatePerimeter() to calculate and return the perimeter of the rectangle.

In the main function, create an instance of the Rectangle class, set its dimensions, and then calculate and display both the area and perimeter of the rectangle.

```
Creating a rectangle with a width of '6.5' and a height of '7.6'
The area of the rectangle is '49.4'
The perimeter of the rectangle is '28.2'
PS C:\Users\wes\github-repos\cs3150_fall2023\Lab6>
```

Question 5:

Create a C++ program to manage employee records. Define a class Employee with private data members for the employee's name, employee ID, and department. Implement a constructor to initialize these values and a destructor to display a farewell message when an object is destroyed. Additionally, create member functions to get and display the employee information.

In the main function, create two instances of the Employee class using the constructor. Set the employee information for each instance and display it. Ensure that the destructor is called when the objects go out of scope and display the farewell message.

Example of a farewell message in the destructor: "Employee [EmployeeName] with ID [EmployeeID] has left the company."

```
Employee 'Todd Peterson' has been hired
Their id is '4857623'
They work in the Accounting department
The employee name is Todd Peterson
Name: Todd Peterson
The employee id is 4857623
Id: 4857623
The employee department is Accounting
Department: Accounting
Employee 'Todd Peterson' has left the company
Their id is '4857623'
They worked in the Accounting department
Employee 'John Smith' has been hired
Their id is '294876'
They work in the Shipping department
The employee name is John Smith
Name: John Smith
The employee id is 294876
Id: 294876
The employee department is Shipping
Department: Shipping
Employee 'John Smith' has left the company
Their id is '294876'
They worked in the Shipping department
```