

Programming Assignment 7: Polymorphism

Total Points (30 pts) - Due Wednesday, November 4 at 11:00 AM

This assignment will give you practice with classes, methods, Inheritance, and polymorphism

Loan Class (30 points)

Sanchez Construction Loan Co. makes loans of up to \$100,000 for construction projects. There are two categories of Loans - those to businesses and those to individual applicants.

Write an application that tracks all new construction loans. The application must also calculate the total amount owed at the due date (original loan amount + loan fee).

The application should include the following classes:

- *Loan*: A public **abstract class** that implements the `LoanConstants` interface. A *Loan* includes a loan number, customer last name, amount of loan, interest rate, and term. The constructor requires data for each of the fields except interest rate. Do not allow loan amounts over \$100,000. Force any loan term that is not one of the three defined in the `LoanConstants` class to a short-term, 1-year loan. Create a `toString()` method that displays all the loan data.
- *LoanConstants*: A public **interface class**. `LoanConstants` includes constant values for short-term (1 year), medium-term (3 years), and long-term (5 years) loans. It also contains constants for the company name and the maximum loan amount.
- *BusinessLoan*: A **public class** that extends *Loan*. The *BusinessLoan* constructor sets the interest rate to 1 percent over the current prime interest rate.
- *PersonalLoan*: A **public class** that extends *Loan*. The *PersonalLoan* constructor sets the interest rate to 2 percent over the current prime interest rate.
- *CreateLoans*: An application that creates an array of five Loans. Prompt the user for the current prime interest rate. Then, in a loop, prompt the user for a loan type and all relevant information for that loan. Store the created Loan objects in the array. When data entry is complete, display all the loans.

Save the files as *Loan.java*, *LoanConstants.java*, *BusinessLoan.java*, *PersonalLoan.java*, and *CreateLoans.java*.

Sample Run:

Input

Welcome to Sanchez Construction
Enter the current prime interest rate
as a decimal number, for example, .05

OK Cancel

Input

Welcome to Sanchez Construction
Enter the current prime interest rate
as a decimal number, for example, .05

OK Cancel

Input

Is this a (1) Business loan
or (2) Personal loan

OK Cancel

Input

Enter account number


OK Cancel

Input

Enter name

OK Cancel


Input ✕

 Enter loan amount

20000

OK Cancel


Input ✕

 Enter term

3

OK Cancel


Input ✕

 Is this a (1) Business loan
or (2) Personal loan

1

OK Cancel


Input ✕

 Enter account number

7890

OK Cancel


Input ✕

 Enter name

Brown

OK Cancel


Input ✕

 Enter loan amount

40000

OK Cancel


Input ✕

 Enter term

1

OK Cancel


Input ✕

 Is this a (1) Business loan
or (2) Personal loan

2

OK Cancel


Input ✕

 Enter account number

89898

OK Cancel


Input ✕

 Enter name

Hillary

OK Cancel


Input ✕

 Enter loan amount

3000

OK Cancel


Input ✕

 Enter term

5

OK Cancel


Input ✕

 Enter account number

23897

OK Cancel


Input ✕

 Enter name

Adam

OK Cancel


Input ✕

 Enter loan amount

7000

OK Cancel


Input ✕

 Enter term

1

OK Cancel


Input ✕

 Is this a (1) Business loan
or (2) Personal loan

2

OK Cancel


Input ✕

 Enter account number

78965

OK Cancel


Input ✕

 Enter name

Barack

OK Cancel


Input ✕

 Enter loan amount

20000

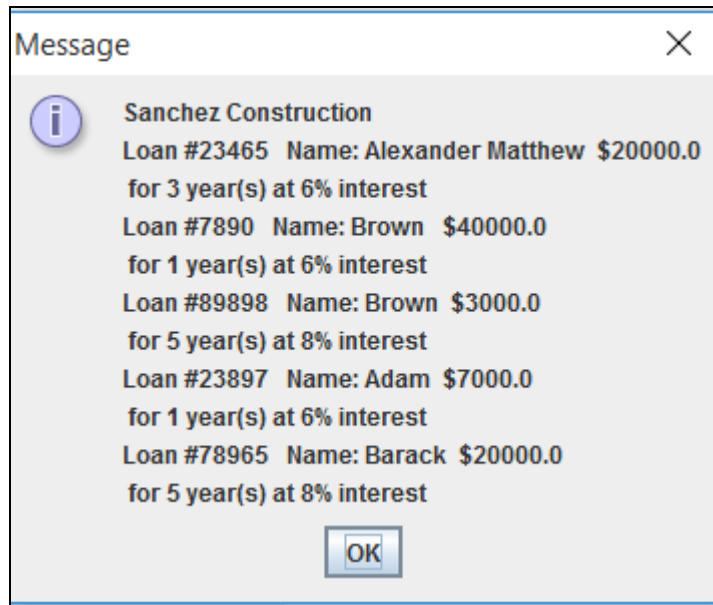
OK Cancel

Input ✕

 Enter term

5

OK Cancel



Submitting Your Assignment

Each assignment requires two submissions: an electronic component submitted through Insight, and a hardcopy component submitted in class.

- The hardcopy submissions must include the following:
 1. A copy of your program. This copy needs to include all the code that you have written for the assignment.
 2. One or more sample runs of your program. In addition to the program copy, submit examples showing the output of your program.
- Additionally, your program must be uploaded to Insight. To upload:
 1. Create a new directory (Assignment7) on your computer, and put all files:
(Loan.java, LoanConstants.java, BusinessLoan.java, PersonalLoan.java, and CreateLoans.java)
inside that directory. Then, compress, or zip up, the directory.
 2. Upload the file Assignment7.zip to Insight by the due date/time.