

```

/**
 * Deborah Barndt
 * 9-6-16
 * AccountHolder.java
 * Lab 1
 * This program will simulate a bank account. It will prompt users for options for
creating an initial balance, entering deposits or withdrawals, and it will
 * allow for the printing of account information including interest at various interest
rates.
 * Written by Deborah Barndt. */

```

```

package BankofIIT;

```

```

import javax.swing.JOptionPane;
import java.text.DecimalFormat;

```

```

public class AccountHolder
{

```

```

    static double balance, // account balance
        annualInterestRate = .04; // interest rate

```

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    //Print 2 decimal places.

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```

    DecimalFormat mydf = new DecimalFormat("0.00");

```

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    // Constructor sets the balance to 0.00.

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```

    public AccountHolder()
    {

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        balance = 0.00;
    }

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    // Constructor sets the starting balance of the account to the value passed.

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```

    public AccountHolder(double newbalance)
    {

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        balance = newbalance;

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        // Check for a positive balance

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        if (balance < 0)
        {

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            JOptionPane.showMessageDialog(null, "Error: You can not start off with
a negative balance.");
        }

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        this.balance = balance >= 0 ? balance: 0;
    }

```

```

    // Constructor sets the balance of the account to the value as a string.

```

```

    public AccountHolder(String balstr)
    {

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        balance = Double.parseDouble(balstr);
    }

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```

    // Method to make a deposit money into the account.

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```

    public void deposit(double amount)
    {

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        balance += amount;
    }

```

```

    // Method to make a deposit money into the account as a string.

```

```

public void deposit(String depstr)
{
    balance += Double.parseDouble(depstr);
}

// Method to withdraw money from the account.
public void withdrawal(double amount)
{
    if (balance <= 100)
    {
        JOptionPane.showMessageDialog(null, "Insufficient Funds for
Withdrawal.");
        amount = 0;
    }
    else
    {
        // Check if the user's balance goes below $500, and add a transaction
fee.
        if (balance - amount < 500)
        {
            // Check if the user's balance is below $100.
            if (balance - amount < 100)
            {
                amount = balance - 100;
                JOptionPane.showMessageDialog(null, "Your balance cannot
go below $100.\n"
                                + "Your withdrawal is now the maximum amount
of $" + mydf.format(amount) + ".");
                balance -= amount;
                amount = 0;
            }
            balance -= 50;
            JOptionPane.showMessageDialog(null, "Your account is below
$500.\n"
                                + "A $50 transaction fee has been deducted from
your account.\n");
        }
        balance -= amount;
    }
}

// Method to withdraw money from the account as a string.
public void withdrawal(String withstr)
{
    balance -= Double.parseDouble(withstr);
}

// Method to calculate the monthly interest rate to the account.
public void monthlyInterest()
{
    balance += balance * (annualInterestRate / 12.0);
}

```

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// Method to modify the monthly interest rate to the account.
public void modifyMonthlyInterest(double interestRateUpdate)
{
    if (interestRateUpdate >= 0 && interestRateUpdate <= 1.0)
    {
        annualInterestRate = interestRateUpdate;
    }
}

// Setter method to set the account balance.
public void setBalance(double newbalance)
{
    balance = newbalance;
}

// Setter method that sets the account balance as a string.
public void setBalance(String balstr)
{
    balance = Double.parseDouble(balstr);
}

// Getter method to return the account balance.
public double getBalance()
{
    return balance;
}

// Getter method to return the annual interest rate.
public static double getAnnualInterestRate()
{
    return annualInterestRate;
}

// Getter method to return the accounts current balance in a string.
@Override
public String toString()
{
    return String.format("%.2f", balance);
}
}

```

```
package BankofIIT;
```

```

import java.awt.Color;
import java.net.MalformedURLException;
import java.net.URL;
import java.text.DecimalFormat;
import javax.swing.ImageIcon;
import javax.swing.JOptionPane;
import java.text.DecimalFormat;
import javax.swing.JTextArea;
import java.text.SimpleDateFormat;
import java.util.Calendar;
import javax.swing.UIManager;

```

```
/**
```

```

* Deborah Barndt
* 9-6-16
* AccountHolderTest.java
* Lab 1
* This programs tests the AccountHolder class.
* Written by Deborah Barndt. */

```

```

public class AccountHolderTest
{
    public static void main(String[] args) throws MalformedURLException
    {
        double balance,           // balance of the account
            annualamount; // the annual amount added to the user's account

        int selection = 0;        // menu selection made by the user

        //Print 2 decimal places.
        DecimalFormat mydf = new DecimalFormat("0.00");

        // Change the color of the background of the dialog box
        UIManager UI = new UIManager();
        UI.put ("OptionPane.background", Color.LightGray);
        UI.put ("Panel.background", Color.LightGray);

        // Print a time stamp for program.
        String timeStamp = new SimpleDateFormat("yyyy/MM/dd
HH:mm:ss").format(Calendar.getInstance().getTime());

        // Prompt the user for the initial balance.
        balance = Double.parseDouble(JOptionPane.showInputDialog("Please enter your
starting balance: "));

        // Create an AccountHolder object.
        AccountHolder account = new AccountHolder(balance);

        // Change icon inside dialog box.
        final ImageIcon icon = new ImageIcon(new
URL("http://iconshow.me/media/images/Business/e-commerce-icon/png/32/bank.png"));

        do
        {
            selection = Integer.parseInt(JOptionPane.showInputDialog("Welcome to
the Bank of IIT!\n"
                + "How many I help you today?\n\n"
                + "1: Check your current balance.\n2: Make a deposit.\n"
                + "3: Make a withdraw.\n4: Update your interest.\n"
                + "5: Check your 12 month annual interest.\n6: Exit\n\n"
                + "Please make a selection: "));

            // Switch statement containing the Bank of IIT Service Menu.
            switch (selection)
            {
                case 1:
                    // Display the user's current balance.

                    JOptionPane.showMessageDialog(null, "Your current balance
is $" + mydf.format(account.getBalance()) + ".\n\n"
                        + "Cur dt = " + timeStamp + "\nProgrammed by

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Deborah Barndt\n", "Account Balance",
                                JOptionPane.INFORMATION_MESSAGE, icon);
        break;

        case 2:
            // Prompt the user for the amount they would like to
deposit.
            balance =
Double.parseDouble(JOptionPane.showInputDialog("Please enter the amount you would like to
deposit: "));
            account.deposit(balance);
            JOptionPane.showMessageDialog(null, "Your current balance
is $" + mydf.format(account.getBalance()) + ".\n\n"
+ "Cur dt = " + timeStamp + "\nProgrammed by
Deborah Barndt\n", "Deposit",
                                JOptionPane.INFORMATION_MESSAGE, icon);
        break;

        case 3:
            // Prompt the user for the amount they would like to
withdrawal.
            balance =
Double.parseDouble(JOptionPane.showInputDialog("Please enter the amount you would like the
withdraw: "));
            account.withdrawal(balance);
            JOptionPane.showMessageDialog(null, "Your current balance
is $" + mydf.format(account.getBalance()) + ".\n\n"
+ "Cur dt = " + timeStamp + "\nProgrammed by
Deborah Barndt\n", "Withdraw",
                                JOptionPane.INFORMATION_MESSAGE, icon);
        break;

        case 4:
            // Check your current interest rate, and update the amount
of interest added to the account.

            account.modifyMonthlyInterest(Double.parseDouble(JOptionPane.showInputDialog("Your
current interest rate is " +
                                mydf.format(account.getAnnualInterestRate())
+ "\n"
                                + "Input the new interest rate in decimal
format: ")));
        break;

        case 5:
            // Display a 12 month print out showing the interest being
added to the user's account. Showing a text area containing the headers for columns,
            // the current balance, and the 12 month print out showing
the interest for each of the 12 months.
            String output = "Your current balance is $" +
mydf.format(account.getBalance()) + ".\n\n"
                                + "Your monthly balances for one
year at " + mydf.format(account.getAnnualInterestRate() * 100) + "% interest rate.\n\n"
                                + "Month\tBalance with
Interest\n";

            Double monthBal = account.getBalance();

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        // Loop to calculate the 12 month print out.
        for (int monthNum = 1; monthNum <= 12; monthNum++)
        {
            output += monthNum + ":\t" + "$" +
mydf.format((monthBal += monthBal * (account.getAnnualInterestRate()/12))) + "\n" ;
        }

        output += "\n\n" + "Cur dt = " + timeStamp + "\nProgrammed
by Deborah Barndt\n";

        // Display the results.
        JOptionPane.showMessageDialog(null, new JTextArea(output),
"12 Month Interest Rate Print Out",
                                JOptionPane.INFORMATION_MESSAGE, icon);

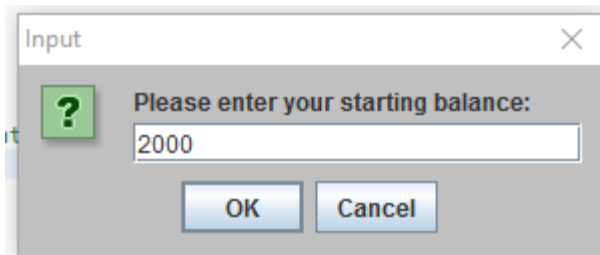
        break;

    case 6:
        // Exit the program.
        System.exit(0);
    }
}

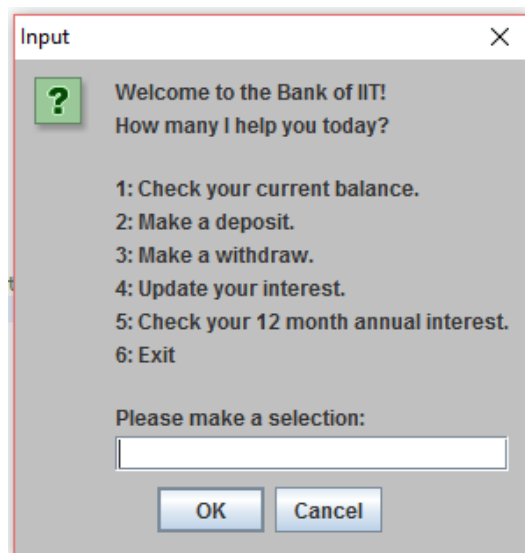
while (selection != 6); // Ends the loop.
}
}

```

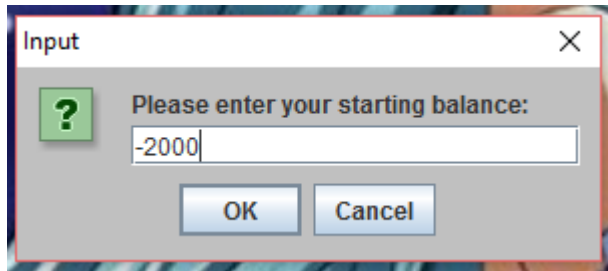
Initial starting balance:



Welcome to Bank of IIT Menu:

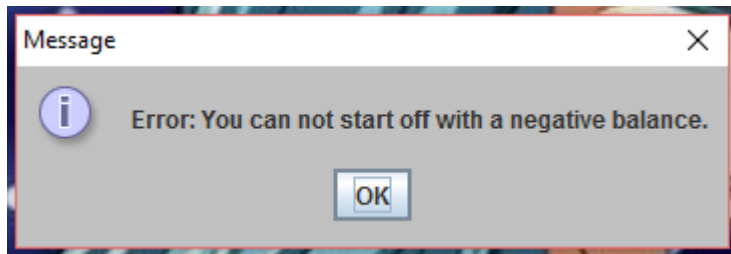


Trying to put in a negative balance:



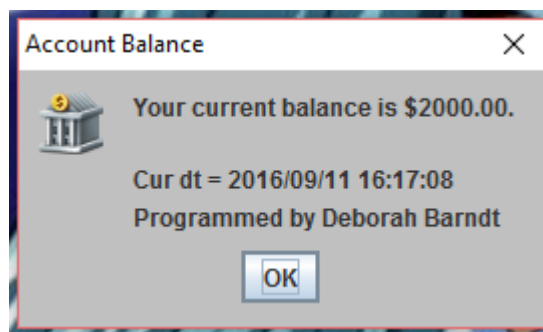
A screenshot of a Windows-style dialog box titled "Input" with a close button (X) in the top right corner. On the left is a green square icon with a white question mark. The text "Please enter your starting balance:" is displayed above a text input field. The input field contains the text "-2000". Below the input field are two buttons: "OK" and "Cancel".

Error message for negative balance:



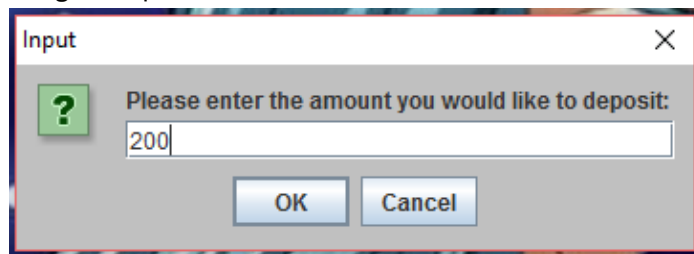
A screenshot of a Windows-style message box titled "Message" with a close button (X) in the top right corner. On the left is a blue circular icon with a white lowercase 'i'. The text "Error: You can not start off with a negative balance." is displayed. At the bottom center is a single button labeled "OK".

Display of current balance:



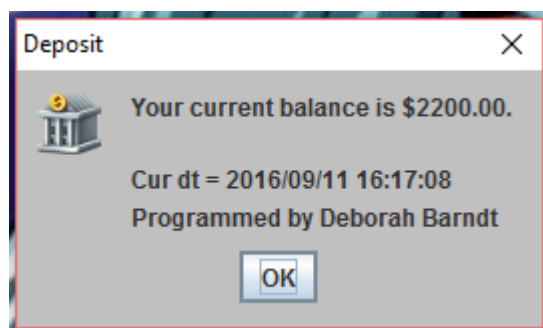
A screenshot of a Windows-style dialog box titled "Account Balance" with a close button (X) in the top right corner. On the left is a bank building icon with a dollar sign. The text "Your current balance is \$2000.00." is displayed. Below this, it says "Cur dt = 2016/09/11 16:17:08" and "Programmed by Deborah Barndt". At the bottom center is a single button labeled "OK".

Making a deposit:



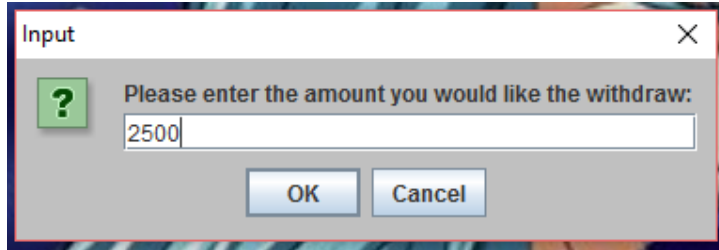
A screenshot of a Windows-style dialog box titled "Input" with a close button (X) in the top right corner. On the left is a green square icon with a white question mark. The text "Please enter the amount you would like to deposit:" is displayed above a text input field. The input field contains the text "200". Below the input field are two buttons: "OK" and "Cancel".

Current balance after deposit:



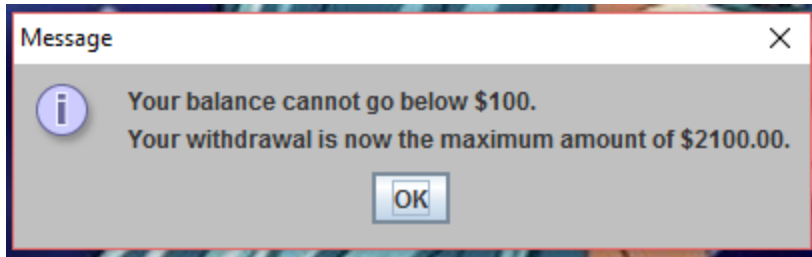
A screenshot of a Windows-style dialog box titled "Deposit" with a close button (X) in the top right corner. On the left is a bank building icon with a dollar sign. The text "Your current balance is \$2200.00." is displayed. Below this, it says "Cur dt = 2016/09/11 16:17:08" and "Programmed by Deborah Barndt". At the bottom center is a single button labeled "OK".

Withdrawing from account:



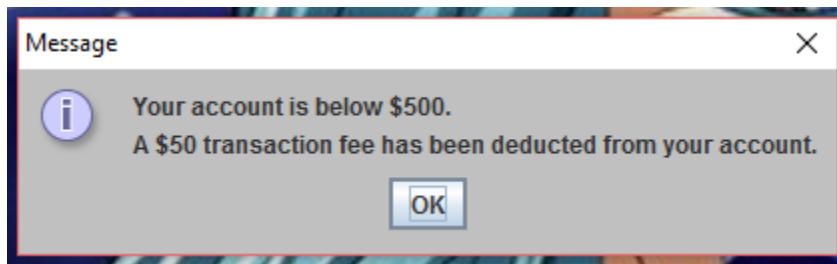
An 'Input' dialog box with a close button (X) in the top right corner. It contains a green question mark icon on the left. The text reads: 'Please enter the amount you would like the withdraw:'. Below this text is a text input field containing the number '2500'. At the bottom are two buttons: 'OK' and 'Cancel'.

Trying to put account below 100 but does the maximum withdrawal:



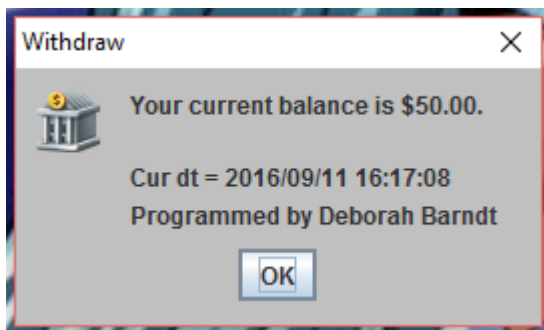
A 'Message' dialog box with a close button (X) in the top right corner. It features a blue information icon (i) on the left. The text says: 'Your balance cannot go below \$100. Your withdrawal is now the maximum amount of \$2100.00.' At the bottom is an 'OK' button.

Account below 500 message:



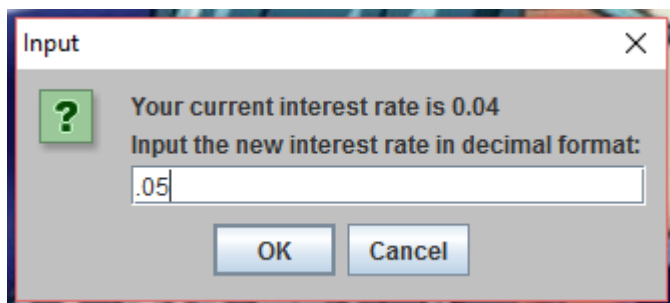
A 'Message' dialog box with a close button (X) in the top right corner. It features a blue information icon (i) on the left. The text says: 'Your account is below \$500. A \$50 transaction fee has been deducted from your account.' At the bottom is an 'OK' button.

Balance after transaction fee:



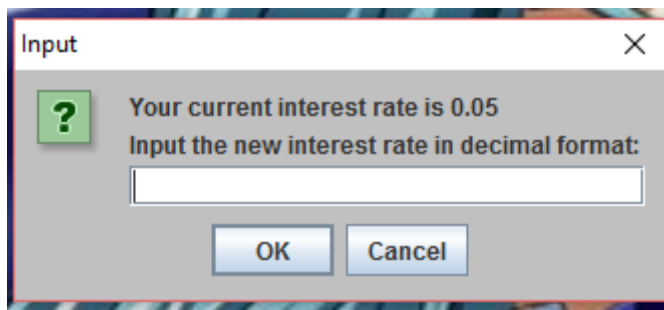
A 'Withdraw' dialog box with a close button (X) in the top right corner. It features a bank building icon with a dollar sign on the left. The text reads: 'Your current balance is \$50.00. Cur dt = 2016/09/11 16:17:08 Programmed by Deborah Barndt'. At the bottom is an 'OK' button.

Interest rate being updated from current interest rate:



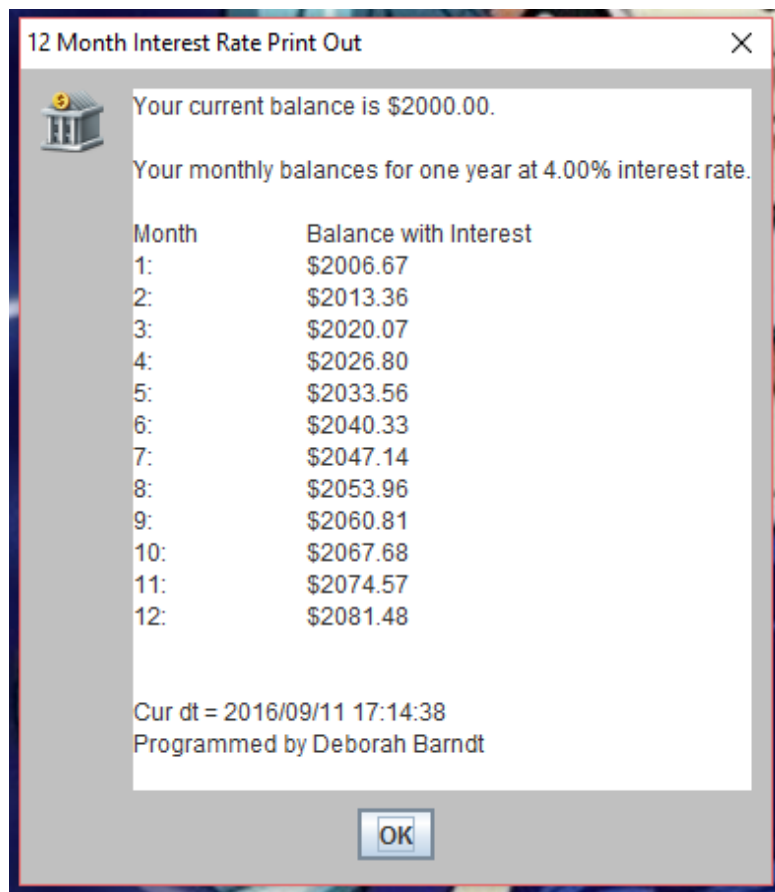
An 'Input' dialog box with a close button (X) in the top right corner. It contains a green question mark icon on the left. The text reads: 'Your current interest rate is 0.04 Input the new interest rate in decimal format:'. Below this text is a text input field containing the number '.05'. At the bottom are two buttons: 'OK' and 'Cancel'.

Display of updated interest rate:



A dialog box titled "Input" with a close button (X) in the top right corner. It contains a green question mark icon, the text "Your current interest rate is 0.05", and a prompt "Input the new interest rate in decimal format:". Below the prompt is a text input field. At the bottom are "OK" and "Cancel" buttons.

Print out of the 4% interest rate print out:



A dialog box titled "12 Month Interest Rate Print Out" with a close button (X) in the top right corner. It features a bank icon and the text "Your current balance is \$2000.00." and "Your monthly balances for one year at 4.00% interest rate." Below this is a table showing monthly balances with interest. At the bottom, it displays the current date and time, and the programmer's name. An "OK" button is at the bottom center.

Month	Balance with Interest
1:	\$2006.67
2:	\$2013.36
3:	\$2020.07
4:	\$2026.80
5:	\$2033.56
6:	\$2040.33
7:	\$2047.14
8:	\$2053.96
9:	\$2060.81
10:	\$2067.68
11:	\$2074.57
12:	\$2081.48

Cur dt = 2016/09/11 17:14:38
Programmed by Deborah Barndt

Print out of the 5% interest rate print out:

