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/**
 * This is an implementation of the BankProgram interface that uses
 * an array to store the data.
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 * CSE222_HW01_101044044
 * -----
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 */
package bankprogram;

import java.io.BufferedReader;
import java.io.FileNotFoundException;
import java.io.FileReader;
import java.io.FileWriter;
import java.io.IOException;
import java.io.PrintWriter;

public class ArrayBasedBP implements BankProgram{
    // Data Fields

    /**
     * The initial capacity of the array
     */
    private static final int INITIAL_CAPACITY = 100;
    /**
     * The current capacity of the array
     */
    private int customersCapacity = INITIAL_CAPACITY;
    /**
     * The current size of the array (number of customer entries)
     */
    private int customersSize = 0;

    private int bankWorkersCapacity = INITIAL_CAPACITY;
    /**
     * The current size of the array (number of bank worker entries)
     */
    private int bankWorkersSize = 0;

    /**
     * The array to contain the customers data
     */
    private Customer[] theCustomers =
        new Customer[customersCapacity];

    /**
     * The array to contain the bank worker data
     */
    private BankWorker[] theBankWorkers =
        new BankWorker[customersCapacity];

    /**
     * The data file that contains the customers data
     */
    private String customersTxt = null;

    /**
     * The data file that contains the bank workers data
     */
    private String bankWorkersTxt = null;

    /**
     * Boolean flag to indicate whether the program was modified since it was
     * either loaded or saved.
     */
    private boolean modifiedAccount = false;
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/**
 * Boolean flag to indicate whether the program was modified since it was
 * either loaded or saved.
 */
private boolean modifiedWorker = false;

/**
 * Method to load the data file. pre: The program storage has been created
 * and it is empty. If the file exists, it consists of name-account number-
 * account balance on adjacent lines.
 * post: The data from the file is loaded into the program.
 *
 * @param customersTxt The name of the data file for customers.
 * @param bankWorkersTxt The name of the data file for bank workers.
 */
@Override
public void loadData(String customersTxt, String bankWorkersTxt) {
    // Remember the source name.
    this.customersTxt = customersTxt;
    this.bankWorkersTxt = bankWorkersTxt;
    try {
        // Create a BufferedReader for the file.
        BufferedReader in = new BufferedReader(
            new FileReader(customersTxt));
        String name;
        String accountNumber;
        String accountBalance;

        // Read each name and number and add the entry to the array.
        while ((name = in.readLine()) != null) {
            // Read name,accountNumber and accountBalance
            // from successive lines.
            if ((accountNumber = in.readLine()) == null) {
                break; // No accountNumber read, exit loop.
            }
            if ((accountBalance = in.readLine()) == null) {
                break; // No accountBalance read, exit loop.
            }
            // Add an entry for this name, accountNumber and
            // accountBalance.
            add(name, accountNumber, accountBalance);
        }

        // Close the file.
        in.close();

        in = new BufferedReader(new FileReader(bankWorkersTxt));

        // Read each name and number and add the entry to the array.
        while ((name = in.readLine()) != null) {
            // Add an entry for this name and number.
            addWorker(name);
        }

        // Close the file.
        in.close();
    } catch (FileNotFoundException ex) {
    } catch (IOException ex) {
        System.err.println("Load of directory failed.");
        System.exit(1);
    }
}

/**
 * Add an entry or change an existing entry.
 */

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    * @param name The name of the customer being added or changed
    * @param accountNumber The new account number to be assigned
    * @param accountBalance The new account number to be assigned
    * @return The old accountNumber or, if a new entry, null
    */
@Override
public String addOrChangeAccount(String name, String accountNumber,
    String accountBalance)
{
    String oldAccountNumber = null;
    int index = find(accountNumber);
    if (index > -1) {
        oldAccountNumber = theCustomers[index].getAccountNumber();
        theCustomers[index].setAccountNumber(accountNumber);
    } else {
        add(name, accountNumber, accountBalance);
    }
    modifiedAccount = true;
    return oldAccountNumber;
}

/**
 * Add an entry or change an existing entry.
 *
 * @param name The name of the worker being added or changed
 * @return The old worker name or, if a new entry, null
 */
@Override
public String addOrChangeWorker(String workerName)
{
    String oldWorkerName = null;
    int index = findWorker(workerName);
    if (index > -1) {
        oldWorkerName = theBankWorkers[index].getName();
        theBankWorkers[index].setName(workerName);
    } else {
        addWorker(workerName);
    }
    modifiedWorker = true;
    return oldWorkerName;
}

/**
 * Look up an account.
 *
 * @param accountNumber
 * @return The account balance. If not in the program, null is returned
 */
@Override
public String lookupAccount(String accountNumber)
{
    int index = find(accountNumber);
    if (index > -1) {
        return theCustomers[index].getAccountBalance();
    } else {
        return null;
    }
}

/**
 * Look up a bank worker.
 *
 * @param accountNumber
 * @return The bank worker, If not in the program, null is returned
 */
@Override
public String lookupBankWorker(String workerName)

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{
    int index = findWorker(workerName);
    if (index > -1) {
        return theBankWorkers[index].getName();
    } else {
        return null;
    }
}

/**
 * Method to save the program. pre: The program has been loaded with
 * data. post: Contents of array written back to the file in the form of
 * name-account number-account balance on adjacent lines.
 * modified is reset to false.
 */
@Override
public void save()
{
    if (modifiedAccount)
    { // If not modified, do nothing.
        try
        {
            try (PrintWriter out = new PrintWriter(
                new FileWriter(customersTxt))) {
                for (int i = 0; i < customersSize; i++) {
                    // Write the name.
                    out.println(theCustomers[i].getName());
                    // Write the account number.
                    out.println(theCustomers[i].getAccountNumber());
                    // Write the account balance.
                    out.println(theCustomers[i].getAccountBalance());
                }
            }
            modifiedAccount = false;
        } catch (Exception ex) {
            System.err.println("Save of accounts file failed");
            System.exit(1);
        }
    }
    if(modifiedWorker)
    { // If not modified, do nothing.
        try
        {
            try (PrintWriter out = new PrintWriter(
                new FileWriter(bankWorkersTxt))) {
                for (int i = 0; i < bankWorkersSize; i++) {
                    // Write the name.
                    out.println(theBankWorkers[i].getName());
                }
            }
            modifiedWorker = false;
        } catch (Exception ex) {
            System.err.println("Save of workers file failed");
            System.exit(1);
        }
    } //end of if
}

/**
 * Find an account in the data base.
 *
 * @param accountNumber The number to be found
 * @return The index of the entry with the requested number. If the
 * accountNumber is not in the data base, returns -1
 */
private int find(String accountNumber)
{

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    for (int i = 0; i < customersSize; i++)
    {
        if (theCustomers[i].getAccountNumber().equals(accountNumber))
        {
            return i;
        }
    }
    return -1; // Account number not found.
}

/**
 * Find a bank worker in the data base.
 *
 * @param workerName The name to be found
 * @return The index of the entry with the requested name. If the
 * workerName is not in the data base, returns -1
 */
private int findWorker(String workerName)
{
    for (int i = 0; i < bankWorkersSize; i++)
    {
        if (theBankWorkers[i].getName().equals(workerName))
        {
            return i;
        }
    }
    return -1; // Account number not found.
}

/**
 * Add a customer to the program.
 *
 * @param name The name of the new person
 * @param accountNumber The number of the new person account
 * @param accountBalance The balance of the new person account
 */
private void add(String name, String accountNumber, String accountBalance)
{
    if (customersSize >= customersCapacity) {
        reallocate();
    }
    theCustomers[customersSize] = new Customer(name, accountNumber, accountBalance);
    customersSize++;
}

/**
 * Add a worker to the program.
 *
 * @param bankWorkerName The name of the new bank worker
 */
private void addWorker(String bankWorkerName)
{
    if (bankWorkersSize >= bankWorkersCapacity) {
        reallocateWorker();
    }
    theBankWorkers[bankWorkersSize] = new BankWorker(bankWorkerName);
    bankWorkersSize++;
}

/**
 * Allocate a new array to hold the bank workers array.
 */
private void reallocateWorker() {
    bankWorkersCapacity *= 2;
    BankWorker[] newBankWorkers = new BankWorker[bankWorkersCapacity];
    System.arraycopy(theBankWorkers, 0, newBankWorkers, 0,
        theBankWorkers.length);
}
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        theBankWorkers = newBankWorkers;
    }

    /**
     * Allocate a new array to hold the customers array.
     */
    private void reallocate() {
        customersCapacity *= 2;
        Customer[] newCustomers = new Customer[customersCapacity];
        System.arraycopy(theCustomers, 0, newCustomers, 0,
            theCustomers.length);
        theCustomers = newCustomers;
    }

    /**
     * Remove a account from the program.
     *
     * @param accountNumber - The number of the account to be removed.
     * @return The current account number. If not in file, null is returned.
     */
    @Override
    public String removeAccount(String accountNumber) {
        int index = find(accountNumber);
        // Wrong. if (index < size) {
        if (index > -1) {
            String returnValue = theCustomers[index].getAccountNumber();
            remove(index);
            modifiedAccount = true;
            return returnValue;
        } else {
            return null;
        }
    }

    /**
     * Remove a account from the program.
     *
     * @param index The index of the item to be removed
     */
    private void remove(int index) {
        for (int i = index; i < customersSize - 1; i++) {
            theCustomers[i] = theCustomers[i + 1];
        }
        --customersSize;
    }
}
```