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CS 1073 (FR02A)
Assignment 12
3429069

Section A

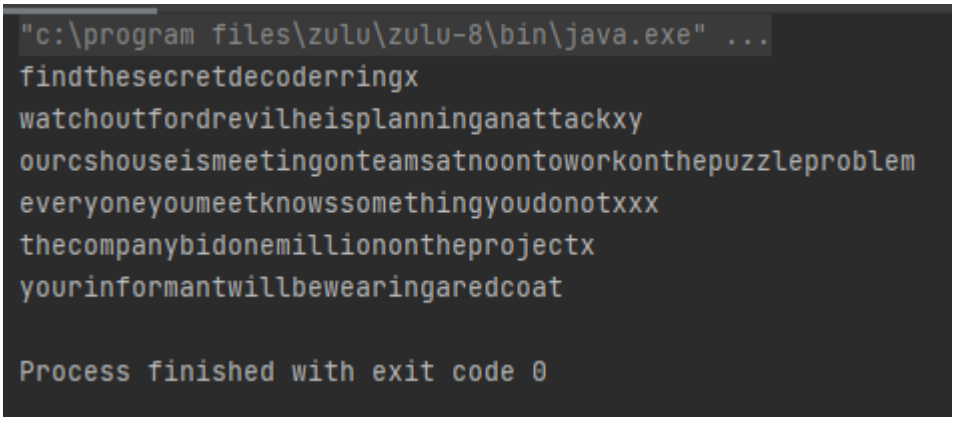
Source Code:

```
import java.io.File;

import java.io.FileNotFoundException;

import java.util.Scanner;


/**

 * Decodes encrypted text in a specific format

 * @author Isaac Shoebottom (3429069)

 */


public class Decoder {

    public static void main(String[] args) throws
FileNotFoundException {


        Scanner scanFile = new Scanner(new File(args[0]));

        int cycleCount = 0;


        scanFile.useDelimiter("\\A");

        String in = scanFile.next();


        String[] codes = in.split("\\r?\\n");


        for (String i: codes) {


            if (i.length() > 1) {

                int columns = Integer.parseInt(codes[cycleCount * 2]);

                int rows = codes[cycleCount * 2 + 1].length() /
columns;


                char[][] decode = new char[rows][columns];
```

```
char[] chars = i.toCharArray();

int charCounter = 0;
for (int k = 0; k < columns; k++) {

    if (k % 2 != 0) {
        for (int j = 0; j < rows; j++) {
            decode[j][k] = chars[charCounter];
            charCounter++;
        }
    }
    else {
        for (int j = rows - 1; j > -1; j--) {
            decode[j][k] = chars[charCounter];
            charCounter++;
        }
    }
}
charCounter = 0;
char[] decodedChar = new char[i.length()];
for (int j = 0; j < rows; j++) {

    if (j % 2 == 0) {
        for (int k = 0; k < columns; k++) {
            decodedChar[charCounter] = decode[j][k];
            charCounter++;
        }
    }
    else {
```

```
                        for (int k = columns - 1; k > -1; k--) {
                            decodedChar[charCounter] = decode[j][k];
                            charCounter++;
                        }
                    }
                }
                cycleCount++;
                String output = String.valueOf(decodedChar);
                System.out.println(output);
            }
            else if (i.equals("0")) {
                break;
            }
        }
    }
}
```

Output:



findthesecretdecoderringx

watchoutfordrevilheisplanninganattackxy

ourcshouseismeetingonteamsatnoontoworkonthepuzzleproblem

everyoneyoumeetknowssomethingyoudonotxxx

thecompanybidonemillionontheprojectx

yourinformantwillbewearingaredcoat

Section B

Source Code (ResidentMember):

```
/**
 * This class holds info for members
 * @author Isaac Shoebottom (3429069)
 */



public class ResidentMember {
    private static int membership = 9999;
    private final String name;
    private final int room;
    private final LendingItem[] list;
    private String phone;
    private int bookCounter;


      /**
       * Constructor for members
       * @param name Name of member
       * @param room Room of member
       * @param phone Phone of member
       */
    public ResidentMember(String name, int room, String phone) {
        this.name = name;
        this.room = room;
        this.phone = phone;
        list = new LendingItem[8];
        bookCounter = 0;
           membership++;
    }
```

```
      /**
       * Get the signed out items of a member
       * @return The updated list item list
       */
      public LendingItem[] getSignedOutItems() {
            LendingItem[] updatedItemList = new
LendingItem[bookCounter];
            for (int i = 0; i < bookCounter; i++) {
                  updatedItemList[i] = list[i];
            }
            return updatedItemList;
      }

      /**
       * Method to sign out items for members
       * @param input The item to be lent
       * @return Boolean for if the item was signed out or not
       */
      public boolean signOut(LendingItem input) {
        if (bookCounter < 8) {
            list[bookCounter] = input;
            bookCounter++;
            return true;
        }
        return false;
    }

      /**
       * Returns and item for members
       * @param input The item to be returned
```

```
   * @return Boolean if the item was returned
   */
  public boolean returnItem(LendingItem input) {
    boolean success = false;
    for (int i = 0; i < bookCounter; i++) {
        if (list[i] == input) {
            list[i] = list[bookCounter - 1];
            bookCounter--;
                  success = true;
        }
    }
    return success;
}

  /**
   * Gets the name of member
   * @return The name of member
   */
public String getName() {
    return name;
}

  /**
   * Gets the room of member
   * @return The room of member
   */
  public int getRoomNumber() {
    return room;
}
```

```
    /**
     * Gets the phone number of member
     * @return The phone number of member
     */
    public String getPhoneNumber() {
        return phone;
    }

    /**
     * Sets the phone of member
     * @param phone
     */
    public void setPhoneNumber(String phone) {
        this.phone = phone;
    }

    /**
     * Gets the membership number of member
     * @return The membership number of member
     */
    public int getMembershipNumber() {
        return membership;
    }

}
```

Source Code (ShortTermResidentMember):

```
/**
 * This class holds info for short term members
 * @author Isaac Shoebottom (3429069)
 */



public class ShortTermResidentMember extends ResidentMember {
    private final String departureDate;


    /**
     * Constructor for short term members
     * @param name Name of short term member
     * @param room Room of short term member
     * @param phone Phone of short term member
     * @param departureDate The departure date of short term members
     */
    public ShortTermResidentMember(String name, int room, String
phone, String departureDate) {
        super(name, room, phone);
        this.departureDate = departureDate;
    }


    /**
     * Method to sign out items for short term members
     * @param input The item to be signed out
     * @return Boolean for if the item was signed out or not
     */
    public boolean signOut(LendingItem input) {
        if (input.isBookClubRecommended()) {
            super.signOut(input);
```

```
            return true;
        }
        return false;
    }

    /**
     * Gets the departure date for short term members
     * @return The departure date
     */
    public String getDepartureDate() {
        return departureDate;
    }

}
```

Source Code (LendingItem):

```
/**
 * This class holds info for the lent item
 * @author Isaac Shoebottom (3429069)
 */

public class LendingItem {
    private final String description;
    private final double price;
    private final boolean recommended;

    /**
     * Constructor for items
     * @param description Description of item
     * @param price The price of the item
     * @param recommended If the item is recommended or not
     */
    public LendingItem(String description, double price, boolean
recommended) {
        this.description = description;
        this.price = price;
        this.recommended = recommended;
    }

    /**
     * Gets the description of item
     * @return The item description
     */
    public String getDescription() {
        return description;
    }
```

```
    /**
     * Gets the price of the item
     * @return The price of the item
     */
    public double getPrice() {
        return price;
    }

    /**
     * Gets if the item is recommended by the book club
     * @return Boolean of if the item is recommended by the book club
     */
    public boolean isBookClubRecommended() {
        return recommended;
    }
}
```

Output:

```
*** Test case #1: Create a Tenant object & test accessors

Name:     Maria Melani

Appt #:   152

Phone:    555-1234

Member #: 10000

Correct result: Maria has zero lending items.


*** Test case #2: Create a ShortTermResidentMember object & test
accessors

Name:     Tommy Black

Appt #:   302

Phone:    555-4321

Member #: 10001

Departs: Dec. 15, 2020

Correct result: Tommy has zero lending items.


*** Test case #3: Automatically generate a member number

Correct result: 10002 is the correct member number.


*** Test case #4: Create a LendingItem object & test accessors

Description: Lean In - Sheryl Sandberg - BOOK

Orig. Price: $10.00

Book Club Recommended:  true


*** Test case #5: Change phone number for both Resident types

Correct result: Maria's phone number successfully changed.

Correct result: Tommy's phone number successfully changed.


*** Test case #6: Sign out one LendingItem

Correct result: Maria signed out an item successfully.
```

Correct result: Maria has one lending item.

*** Test case #7: Sign out multiple LendingItems

Correct result: Maria signed out two more items successfully.

Correct result: Maria has three lending items.

*** Test case #8: Intentionally exceed the sign out limit

Correct result: Maria was prevented from signing out more than 8 lending items.

*** Test case #9: A short-term resident tries to sign out a recommended item

>> ERROR: Tommy was able to sign out a book club recommended item.

>> ERROR: Tommy was prevented from signing out a non recommended item.

*** Test case #10: Returning the only item that was signed out

Correct result: Tommy's item was successfully returned.

Correct result: Tommy's list length changed appropriately.

*** Test case #11: Returning an item that was not signed out

Correct result: Unsuccessful attempt to return an item that was not signed out.

*** Test case #12: Returning the first item that was signed out

Correct result: Maria's first item was successfully returned.

Correct result: Maria's list length changed appropriately.

Confirm return: Lean In should be absent from the following list:

Yoga Journal - October 2020 - MAGAZINE

Maclean's - 23/11/2020 - MAGAZINE

Headstrong: 52 Women Who Changed Science and the World - Rachel Swaby - BOOK

The Time Machine - H.G. Wells - BOOK

The Confidence Code - Katty Kay & Claire Shipman - BOOK

The Immortal Life of Henrietta Lacks - Rebecca Skloot - BOOK

Grit - Angela Duckworth - BOOK

*** Test case #13: Returning a mid-list item

Correct result: The Time Machine was successfully returned.

Correct result: Maria's list length changed appropriately.

Confirm return: The Time Machine should be absent from the following list:

Yoga Journal - October 2020 - MAGAZINE

Maclean's - 23/11/2020 - MAGAZINE

Headstrong: 52 Women Who Changed Science and the World - Rachel Swaby - BOOK

Grit - Angela Duckworth - BOOK

The Confidence Code - Katty Kay & Claire Shipman - BOOK

The Immortal Life of Henrietta Lacks - Rebecca Skloot - BOOK

********** End of Test Cases **********