2021F CS234 Computer Science II

Lab 6
Total points: 100

Based on P8.15 and P8.16 (100 points)

For this laboratory you need to create **two** Java **classes.**
You will practice how an object of one class can use objects from different classes.

First, design a class ***Message*** that models email messages.
A message has a **sender,** a **recipient,** and a **message text.**
The class needs to support the following methods:

1)
```
/**
       Constructor that takes the sender and recipient. Initializes the messageText instance
       variable
       @param sender. The sender
       @param recipient. The recipient
**/
```

2)
```
/**
       Appends a line of text to the message body
       @param line. The line to append
**/
```

3)
```
/**
       Prints the email (i.e., sender, recipient, and content)
**/
```

For **more information** about how to use this class **see** the **tester** program.

Second, design a class ***Mailbox*** that **manages** emails messages (using the Message class)
The Mailbox class has the following methods:

1)
```
/**
       Constructor that initializes an instance variable for an ArrayList to store the email
       objects
**/
```

2)
```
/**
       Store a new message object in the ArrayList
       @param m. An object of class Message
**/
```

3)
```
/**
       Remove the i-th message from the ArrayList
       @param i. The message number to remove
**/
```

4)

```
/**
        Prints the i-th message in the Array List
        @param i. The message number to show
**/
```

5)

```
/**
        Get the size of the mailbox
**/
```

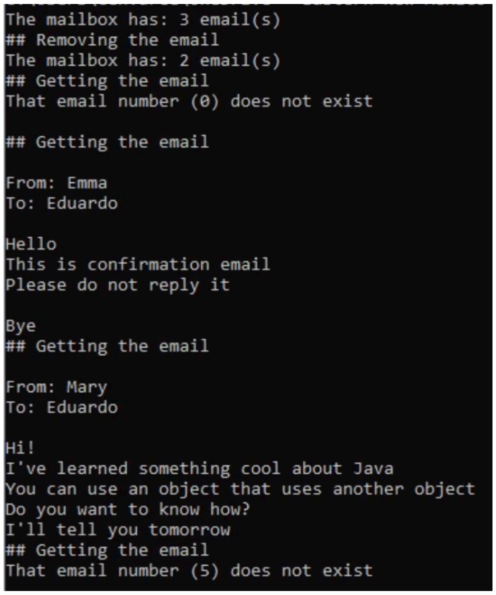
Methods **3** and **4** for this class need to **validate** that the **number** of the email exists.

For **more information** about how to use this class **see** the **tester** program.

How to **test** your program?
You can implement a **tester program** like the following:

```
public static void main(String[] args)
        {
                // Create a new mailbox
                Mailbox myMail = new Mailbox();

                // Create a new email (1)
                Message email1 = new Message("Emma", "Eduardo");
                // Add lines to the email
                email1.append("Hello");
                email1.append("This is confirmation email");
                email1.append("Please do not reply it");
                email1.append("");
                email1.append("Bye");
                // Add the email to the mailbox
                myMail.addMessage(email1);

                // Create a new email (2)
                Message email2 = new Message("Thomas", "Eduardo");
                // Add lines to the email
                email2.append("Hello Thomas");
                email2.append("Let's go to the park tomorrow");
                email2.append("");
                email2.append("Bye");
                // Add the email to the mailbox
                myMail.addMessage(email2);

                // Create a new email (3)
                Message email3 = new Message("Mary", "Eduardo");
                // Add lines to the email
                email3.append("Hi!");
                email3.append("I've learned something cool about Java");
                email3.append("You can use an object that uses another object");
                email3.append("Do you want to know how?");
                email3.append("I'll tell you tomorrow");
                // Add the email to the mailbox
                myMail.addMessage(email3);

                // Get the mailbox size
                myMail.getSize();

                // Remove an email from the mailbox
                myMail.removeMessage(2);

                // Get the mailbox size
                myMail.getSize();

                // Print the email
                myMail.getMessage(0);
                // Print the email
                myMail.getMessage(1);

                // Print the email
                myMail.getMessage(2);

                // Print the email
                myMail.getMessage(5);
            }
```

The **output** of the **tester** program is the following:



```
The mailbox has: 3 email(s)
## Removing the email
The mailbox has: 2 email(s)
## Getting the email
That email number (0) does not exist

## Getting the email

From: Emma
To: Eduardo

Hello
This is confirmation email
Please do not reply it

Bye
## Getting the email

From: Mary
To: Eduardo

Hi!
I've learned something cool about Java
You can use an object that uses another object
Do you want to know how?
I'll tell you tomorrow
## Getting the email
That email number (5) does not exist
```

Submission details:

Upload a **single ZIP** file.
Name your file as follows: **Lab6_Lastname_Firstname.zip**
There is a **10% points deduction** if your file does not have the correct name.

Your **.zip** file must contain the following:

1. Your **.java** source files for your **classes** (.java files **without** the **main** method. No .class files).
2. A **SINGLE PDF** with screenshots from your programs running (10% points deduction if you don't submit a **SINGLE** PDF file)

For this lab, you do **not need to submit the .txt** file with your instructions. **Why?** Because I will use my tester program to use your classes. Therefore, it is **extremely important** that your **class and method names** are **correct.**

I don't require the use of packages. **However, If,** you want to use a package to organize your code then you need to **submit a .txt** file with **clear instructions** about **how to use** your package (i.e., the package name, the package path, imports, how to compile, and how to execute your program, etc.). Review the lecture from 09/23/2021.

In each .java file, **write** as a multiline comment at the beginning of the file the following:

1. Your name

2. The ID of the problem (e.g., P8.15)
3. The course section

The **zip** file must be uploaded to Canvas. I do not accept answers via email. I do not accept image files; it must be a **PDF** file.

Make sure to check the **due date** for this activity on Canvas.
Make sure you are **submitting the correct files.** I will grade the file uploaded to Canvas.
Make sure you **test** your **classes** with a similar **tester program** as the one I am showing in this lab (i.e., a .java program with a main method where you create objects from your class). Please, **test your program** with different use cases.
Use the ***javac*** and ***java*** commands to compile and **test** your classes **before** submitting your solution.
You **don’t submit** your **tester** program.
Make sure to review the grading rubric.
Late submissions are not allowed.