

Assignment 8

Refer to Canvas for assignment due dates for your section.

Objectives:

- Continue to familiarize yourself with data collections in Java.
- Command line input argument parsing.
- Java I/O.
- Continue to meet the objectives of previous assignments, where applicable.

General Requirements

Create a new Gradle project for this assignment in your **group** GitHub repo.

For this assignment, please continue to use packages as in the past. There is only one problem so you may have only one package but it can be helpful to create additional packages to keep your code organized. The requirements for repository contents are the same as in previous assignments.

GitHub and Branches

Each individual group member should create their own branch while working on this assignment. Only merge to the master branch when you're confident that your code is working well. You may submit pull requests and merge to master as often as you like. Guidelines on working with branches are available from the assignment page in Canvas.

To submit your work, push it to GitHub and create a release on your main branch. Only one person needs to create the release.

The problem: Insurance company communication automation

You are a member of an IT team for a nationwide insurance company. Unfortunately, your company recently suffered a devastating data breach. Private and sensitive data of millions of your customers may now be compromised...

The whole company is still grappling with the consequences of the breach, but the clock is already ticking – it is time to inform the customers. The members of the board of the company have decided to send an email informing every customer about the data breach. Then, the company will also send the same information using the regular mail. **They are asking you to help them out, and to automate the process that the insurance company will use to communicate with its customers.**

The insurance stores information about their clients in CSV file. The CSV file is a plain text file, containing data organized into columns separated by a comma. The data in each column is enclosed in double quotes. The first line of the file contains the headers for each column.

For example, the following listing has 4 columns named `first_name`, `last_name`, `company_name`, and `email`. The second line has information for supporter James Reign.

```
"first_name","last_name","company_name","email"
"James, "Reign","Benton","james.reign@gmail.com"
"Josephine","R, Darakjy","Canay","josie55@hotmail.com"
"Art","Venere","Chemel","art2smart@gmail.com"
```

While the information is enclosed in double quotes, and separated by comma, it is possible that column entries may contain a comma. For example, on row 3 in the listing above, "R,Darakjy" is one valid piece of information, not two.

A sample file, containing some of the nonprofit's supporters' information, is available on [Cavas](#). The CSV file contains first and last name, company name, address, city, county, state, zip, phone 1, phone 2, email address, and web page URL.

The company uses templates for generating communication to be sent to all clients. The templates are stored as text files with special placeholders in the text that refer to the CSV file's header names. Placeholders are CSV column headers between `[[` and `]]` e.g. `[[first_name]]`.

The insurance company would like you to create a program that they can run on the command line. The program should take a CSV file and a template (or two) as input, and generate files that will contain the email messages and letters to send to their clients. When the program is run, it should output a new text file per row in the CSV file, with all placeholders replaced with the appropriate value for that row. See the "Example input and output" section of this specification for examples.

Your program should accept the following command line arguments¹ in any order:

<code>--email</code>	Generate email messages. If this option is provided, then <code>--email-template</code> must also be provided.
<code>--email-template <path/to/file></code>	A filename for the email template.

¹ You are expected to write your own command line parser, rather than using an external package such as Apache Commons CLI.

<code>--letter</code>	Generate letters. If this option is provided, then <code>--letter-template</code> must also be provided.
<code>--letter-template <path/to/file></code>	A filename for the letter template.
<code>--output-dir <path/to/folder></code>	The folder to store all generated files. This option is required.
<code>--csv-file <path/to/file></code>	The CSV file to process. This option is required.

Note that some options take arguments. For example, `--email-template` takes a file path and `--output-dir` takes a folder. Where an argument is required, it must immediately follow the option. Other options take no arguments and indicate an action e.g. `--email` indicates that email messages should be generated.

Also note that some options require other options to also be present. For example, if the program is run with the `--email` option, then the `--email-template` option (with its required argument) must also be provided. Calling your program with invalid combinations of arguments should generate an error. For example, the following command is illegal because it contains `--email` but `--email-template` is not provided:

```
--email --letter-template letter-template.txt --output-dir letters/
```

A user can request both emails and letters as long as all the necessary inputs are provided.

When a user provides an illegal combination of inputs, the program should exit with a helpful error message, and a short explanation of how to use the program along with examples. See the “Example input and output” section for an example error message.

For this assignment, you are provided with one example CSV file, and two examples of templates (available on Canvas). The insurance company, however, may in future like to write more templates, and your program should accommodate those new templates. Therefore, your code should work for any CSV file and any template that uses the CSV file’s header values as placeholders. Please also make sure that your program works correctly regardless of how your operating system represents paths and files.

Your tasks:

1. Design and implement the email and the letter generator program for the insurance company, as described above.
2. Please write appropriate Javadoc documentation for your classes and methods.
3. Please write the corresponding test classes for your classes.
4. Please provide a final UML Class Diagram for your design

Example input and output

Email template

Here is the example template for an email.

```
To:[[email]]
Subject: Insurance company - information about recent data breach

Dear [[first_name]] [[last_name]],

As you may have heard or read, last month we learned that criminals
forced their way into our systems, and stole information about our
customers. Late last week, as part of our ongoing investigation, we
learned that the taken information includes names, mailing addresses,
phone numbers or email addresses.

I am writing to make you aware that your name, mailing address, phone
number or email address may have been taken during the intrusion.
I am truly sorry this incident occurred, and I sincerely regret any
inconvenience it may cause you.

Because we value you as a customer, and because your trust is
important to us, our company is offering you one year of free credit
monitoring through Experian's ProtectMyID product, which includes
identity theft insurance where available. You will receive more
information about this offer via regular mail.

You can find additional information and FAQs about this incident at
our website. If you have further questions, you may call us at 866-
852-8680.
```

Thank you for your patience and your loyalty.

Sincerely,
Insurance Company CEO

So, given the above email template and the following line from the CSV file:

```
"first_name","last_name","company_name","address","city","county","state","zip","phone1","phone2","email","web"  
"Art","Venere","Chemel, James L Cpa","8 W Cerritos Ave  
#54","Bridgeport","Gloucester","NJ","08014","856-636-8749","856-264-  
4130","art@venere.org","http://www.chemeljamescpa.com"
```

...the email that is generated looks like:

To: **art@venere.org**

Subject: Insurance company - information about recent data breach

Dear **Art Venere**,

As you may have heard or read, last month we learned that criminals forced their way into our systems, and stole information about our customers. Late last week, as part of our ongoing investigation, we learned that that information includes names, mailing addresses, phone numbers or email addresses.

I am writing to make you aware that your name, mailing address, phone number or email address may have been taken during the intrusion. I am truly sorry this incident occurred, and I sincerely regret any inconvenience it may cause you.

Because we value you as a customer, and because your trust is important to us, our company is offering you one year of free credit monitoring through Experian's ProtectMyID product, which includes identity theft insurance where available. You will receive more information about this offer via regular mail.

You can find additional information and FAQs about this incident at our website. If you have further questions, you may call us at 866-852-8680.

Thank you for your patience and your loyalty.

Sincerely,
Insurance Company CEO

Letter template

Here is the example template for a letter.

```
[[first_name]] [[last_name]]  
[[address]], [[city]],  
[[county]], [[state]], [[zip]]  
([[email]])
```

Dear [[first_name]] [[last_name]],

As you may have heard or read, last month we learned that criminals forced their way into our systems, and stole information about our customers. Late last week, as part of our ongoing investigation, we learned that the taken information includes names, mailing addresses, phone numbers or email addresses.

I am writing to make you aware that your name, mailing address, phone number or email address may have been taken during the intrusion. I am truly sorry this incident occurred, and I sincerely regret any inconvenience it may cause you.

Because we value you as a customer, and because your trust is important to us, our company is offering you one year of free credit monitoring through Experian's ProtectMyID product, which includes identity theft insurance where available. Enclosed please find your additional information about your free credit card monitoring.

You can find additional information and FAQs about this incident at our website. If you have further questions, you may call us at 866-852-8680.

Thank you for your patience and your loyalty.

Sincerely,

Insurance Company CEO

So, given the above letter template and the following line from the CSV file:

```
"first_name","last_name","company_name","address","city","county","state","zip","phone1","phone2","email","web"
"Art","Venere","Chemel,James L Cpa","8 W Cerritos Ave
#54","Bridgeport","Gloucester","NJ","08014","856-636-8749","856-264-
4130","art@venere.org","http://www.chemeljamescpa.com"
```

...the letter that is generated looks like:

Art Venere
8 W Cerritos Ave #54, Bridgeport,
Gloucester, NJ, 08014.
(art@venere.org)

Dear Art Venere,

As you may have heard or read, last month we learned that criminals forced their way into our systems, and stole information about our customers. Late last week, as part of our ongoing investigation, we learned that the taken information includes names, mailing addresses, phone numbers or email addresses.

I am writing to make you aware that your name, mailing address, phone number or email address may have been taken during the intrusion. I am truly sorry this incident occurred, and I sincerely regret any inconvenience it may cause you.

Because we value you as a customer, and because your trust is important to us, our company is offering you one year of free credit monitoring through Experian's ProtectMyID product, which includes identity theft insurance where available. Enclosed please find your additional information about your free credit card monitoring.

You can find additional information and FAQs about this incident at our website. If you have further questions, you may call us at 866-852-8680.

Thank you for your patience and your loyalty.
Sincerely,

Insurance Company CEO

Example error message

If the program is run with the following arguments:

```
--email --letter-template letter-template.txt --output-dir letters/
```

Then the error message might look something like this:

```
Error: --email provided but no --email-template was given.
```

Usage:

```
--email Generate email messages. If this option is provided, then --  
email-template must also be provided.  
--email-template <path/to/file> A filename for the email template.  
--letter Generate letters. If this option is provided, then --letter-  
template must also be provided.  
--letter-template <path/to/file> A filename for the letter template.  
--output-dir <path/to/folder> The folder to store all generated  
files. This option is required.  
--csv-file <path/to/folder> The CSV file to process. This option is  
required.
```

Examples:

```
--email --email-template email-template.txt --output-dir emails --  
csv-file customer.csv
```

```
--letter --letter-template letter-template.txt --output-dir letters -  
-csv-file customer.csv
```