**Texas A&M University – Corpus Christi**

**Department of Computing Sciences**

# COSC6374 – Spring 2023

**Assignment 1**

**Implementing enron\_search: an Email Forensic Analysis Tool**

Email continues to be an essential component of conducting business. This course-long project will introduce you to email forensics by having you write a tool that can analyze the Enron email data set. For instance, given a term to search, it will return the sender's email address and the date and time the message was sent by using the From: and Date: headers, respectively. **For this assignment, you will be allowed to work on teams of two or three students.** Some students may go solo if they prefer that, but no teams of more than three students please.

**Instructions**

1. Download the Enron email data set from https://www.cs.cmu.edu/~enron/.

Be sure to get the May 7, 2015 version. The file will be named

enron\_mail\_20150507.tar.gz.

1. Go to https://github.com/lintool/Enron2mbox and follow the instructions to convert the data to the mbox format.
2. For whatever language you plan to use for this assignment, find an mbox library.

If you plan to use Python, check out the following links:

* https://docs.python.org/3/library/mailbox.html#mbox

Take note that the mbox class is, because it is a subclass of the Mailbox class, an *iterator*, meaning you can use it in a for loop like this:

for message in my\_mbox\_class\_instance:

* https://docs.python.org/3/library/mailbox.html#mailbox.mboxMessage

mailbox.mboxMessage is a subclass of mailbox.Message which is a subclass of email.message.Message. You will need to understand the email.message.Message class's API for accessing the email's payload. Take note that email.message.Message is **not** a subclass of email.message.EmailMessage.

1. Write a program that satisfies the description above and conforms to the following usage specifications:

enron\_search term\_search term [term ...]

term: A word to search for in the data set. The search will be case-insensitive, but exact, meaning neither fuzzy matching nor partial matching is performed. When more than one term is given, only emails with ALL terms in the body will be returned.

Your program should ignore duplicate terms and term order, so that the following are equivalent:

enron\_search term\_search the The THE money

enron\_search term\_search MONEY tHe monEY

enron\_search term\_search the money

The exclusion of fuzzy matching means that the term cash will not match the string money, although they are semantically similar. Exact matching (no partial matching) means the will not match the string them.

For each email with a message body (payload) that matches all the terms given by the user, you should capture and output the sender (using the From: header field) and the date the email was sent (using the Date: header field). Your program should number the results and display the total number of results found when the search completes. It is totally fine for your program to output both the sender's email address and the date/time sent in the same formats as they are stored in the email headers.

The following examples are notional (i.e., made up) and are **not** from the Enron data set. Lines starting with $ are what the user enters into the command line. The other lines are the program's output.

$ enron\_search term\_search hide all the evidence

1. Guy Incharge <incharge@enron.com> Mon, 18 Mar 1995 14:47:38 -0500

2. Peon Smith <psmith@enron.com> Tue, 19 Mar 1995 14:47:38 -0500

3. Guy Incharge <incharge@enron.com> Wed, 20 Mar 1995 14:47:38 -0500

4. Peon Smith <psmith@enron.com> Thu, 21 Mar 1995 14:47:38 -0500

Results found: 4

1. Implement a new command to obtain all the emails sent and received by a given person:

* enron\_search address\_search last\_name first\_name

where last\_name and first\_name belong to the person you are trying to obtain the email addresses from. As a result, you will list the information of each obtained address as follows:

$ enron\_search address\_search carlos rubio-medrano

1. <carlos.rubiomedrano@tamucc.edu>

2. <crubiome@asu.edu>

Results found: 2

1. Implement a new command to obtain all the emails exchanged by two people, regardless of who initiated the communication in the first place:

* enron\_search interaction\_search address\_1 address\_2

where address\_1 and address\_2 identify the two people interacting with each other. The results should be displayed back to the screen as follows:

$ enron\_search interaction\_search crubiome@asu.edu dean@tamucc.edu

1. <crubiome@asu.edu> -> <dean@tamucc.edu> [Subject: Inquiry on Open Position] Mon, 18 Mar 2020 14:47:38 -0500
2. <dean@tamucc.edu> -> <crubiome@asu.edu> [Subject: Re: Inquiry on Open Position] Mon, 18 Mar 2020 14:57:38 -0500

Results found: 2

**Implementation**

**You are free to use the programming language of your choice**. However, **you are required to** **implement the command line interface** we discuss next, so we can properly test your code and we can correctly award you all the points you may deserve for your hard work. Please be advised that any deviations from the expected behavior of your code, e.g., it fails to compile or implement the requested command line interface correctly, will result in points being deducted from your grade.

**Submission Instructions**

Submit your source code as a **ZIP file** on the *Course Content/ Assignments/Assignment 1/Assignment 1* submission link located on our Course Blackboard Site. Also, submit a separate README file containing the name of all the members of the team, TAMUCC ID, and a description of how your program works. To avoid confusions, **only one member of the team should submit the assignment**. Do NOT submit the Enron data set with your code!

**Academic Integrity**

**All submissions to this assignment will be checked for plagiarism, and all detected cases will be promptly reported to TAMUCC authorities**. Please direct any questions or clarifications regarding this assignment to the discussion forum labeled as *Assignment-1 Questions* within the class Blackboard site.