Network programming
Laboratory Work
Metrics Aggregator

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1 Introduction

Task

Base Task

- pick up an e-mail service (it should support IMAP/POP3 and SMTP clients), ...
- Log in;
- Get number of unread messages;
- Get last N received messages (display subject, date, sender), ordered by date;
- Send a message. Next fields must be available - subject, recipient, CC, body;

Message Preview and MIME-types

- Display additional info for messages list:
  - If there're attachments in the e-mail, display number of attached files;
  - If message is plain text, display a short preview of the message (e.g. first sentence);
- Allow to select and read a message (just display content)

Examples of some metrics:

2 Theory

2.1 about OSI model

The Open Systems Interconnection model (OSI model) is a conceptual model that characterizes and standardizes the communication functions of a telecommunication or computing system without regard to its underlying internal structure and technology. Its goal is the interoperability of diverse communication systems with standard protocols. The model partitions a communication system into abstraction layers. The original version of the model defined seven layers.

7 layers of OSI:

- Layer 1: Physical Layer
- Layer 2: Data Link Layer
- Layer 3: Network Layer
- Layer 4: Transport Layer
- Layer 5: Session Layer
- Layer 6: Presentation Layer
- Layer 7: Application Layer

2.2 (De)serialization

In computer science, in the context of data storage, serialization is the process of translating data structures or object state into a format that can be stored (for example, in a file or memory buffer) or transmitted (for example, across a network connection link) and reconstructed later (possibly in a different computer environment). When the resulting series of bits is reread according to the serialization format, it can be used to create a semantically identical clone of the original object. For many complex objects, such as those that make extensive use of references, this process is not straightforward. Serialization of object-oriented objects does not include any of their associated methods with which they were previously linked.

This process of serializing an object is also called marshalling an object. The opposite operation, extracting a data structure from a series of bytes, is deserialization (which is also called unmarshalling).

2.3 Concurrency

n computer science, concurrency refers to the ability of different parts or units of a program, algorithm, or problem to be executed out-of-order or in partial order, without affecting the final outcome. This allows for parallel execution of the concurrent units, which can significantly improve overall speed of the execution in multi-processor and multi-core systems. In more technical terms, concurrency refers to the decomposability property of a program, algorithm, or problem into order-independent or partially-ordered components or units.

3 Implementation

3.1 Short preview and number of unread messages

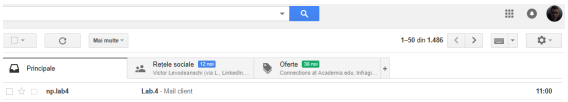
Here is presented an example, where my program, Logged in, show how many unread messages you have and a short preview of last N mails, Subject, Date and Sender:

```
Unseen:  2
give number of emails to display : 4
Subject:  Get help setting up G Suite for prlab4.net.in
Date:  Tue, 01 May 2018 03:12:46 -0700
From:  gsuite-noreply@google.com
_____________
Subject:  Set up G Suite for prlab4.net.in
Date:  Sun, 29 Apr 2018 03:12:24 -0700
From:  gsuite-noreply@google.com
_____________
Subject:  mm
Date:  Sat, 28 Apr 2018 15:16:38 +0300
From:  Joi Vineri <contulnr13@gmail.com>
_____________
Subject:  Welcome to your G Suite trial for prlab4.net.in
Date:  Sat, 28 Apr 2018 03:12:25 -0700
From:  gsuite-noreply@google.com
_____________
```

3.2 Send message

Introduce data to send a new mail

```
Enter receivers mail: simionov.mihai.a@gmail.com
Enter subject: Lab.4
Enter CC: some CC
Enter body of mail: Mail client
mail send
```

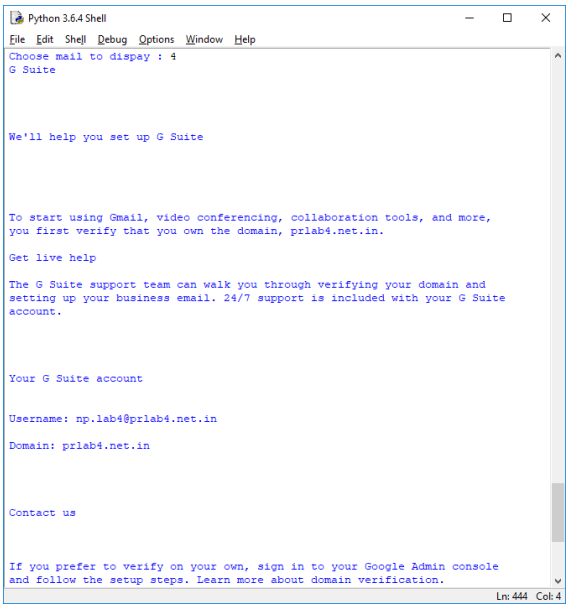


3.3 Short body preview

From every message is shown first proposition. Also shows number of attachments.

```
Thanks for starting your free trial
_____________________________________________________________
Email No.  2
mmmmvc
_____________________________________________________________
Email No.  3
G Suite



G Suite is ready for you



Set up your G Suite account to start using business email, video
conferencing, cloud storage, file sharing, and more
_____________________________________________________________
Email No.  4
G Suite



We'll help you set up G Suite



To start using Gmail, video conferencing, collaboration tools, and more,
you first verify that you own the domain, prlab4
_____________________________________________________________
Email No.  5

Attachment(s):  1
```

3.4 Choose and display the content of a mail



4 Concluzion

In this laboratory work I‘ve got some experience working with mail client in python. I have learned new things about how to send a message, how to operate with information from your mail, play with headers and body and other interesting stuff.