Name: Muhammad Mobeen

Registration No: 200901097

BSCS01-(B)

Presented to: Sir Faran

Computer Networks

Assignment #3

A Python-based mail server that supports IMAP and SMTP protocols - and is compatible with external email services

Sure! I'll generate a detailed report explaining what is happening in the code, including comments within the code.

```python
import smtplib
import imaplib
from email.mime.text import MIMEText

# Read the email server configuration and credentials from a file
with open("creds.txt", "r") as myfile:
    data = myfile.read().splitlines()

print(data)

# SMTP Server Configuration
SMTP_SERVER = data[0]
SMTP_PORT = int(data[1])

# IMAP Server Configuration
IMAP_SERVER = data[2]
IMAP_PORT = int(data[3])

# Email Credentials
email_user = data[4]
email_password = data[5]
```

In the above code, the email server configuration and credentials are read from a file called "creds.txt". The file is assumed to contain the server addresses, ports, and email credentials on separate lines. The file is read using the `open` function and then split into lines using the `splitlines` method. The variables `SMTP_SERVER`, `SMTP_PORT`, `IMAP_SERVER`, `IMAP_PORT`, `email_user`, and `email_password` are assigned the corresponding values from the `data` list.

```python
def send_email(recipient, subject, body):
    msg = MIMEText(body)
    msg['Subject'] = subject
    msg['From'] = email_user
    msg['To'] = recipient

    # Connect to the SMTP server
    smtp_server = smtplib.SMTP(SMTP_SERVER, SMTP_PORT)
    smtp_server.starttls()

    # Login to your Email account
    smtp_server.login(email_user, email_password)

    # Send the email
    smtp_server.send_message(msg)
    smtp_server.quit()
```

The `send_email` function is responsible for sending an email. It takes the recipient's email address, subject, and body as arguments. It creates a `MIMEText` object and sets the subject, sender, and recipient email addresses. Then it connects to the SMTP server using the provided server address and port. It enables TLS encryption with `starttls()` method and logs into the email account using the provided credentials. Finally, it sends the message using the `send_message` method of the SMTP server and quits the server connection.

```python
def receive_emails():
    # Connect to the IMAP server
    imap_server = imaplib.IMAP4_SSL(IMAP_SERVER, IMAP_PORT)

    # Login to your Email account
    imap_server.login(email_user, email_password)

    # Select the mailbox (e.g., "INBOX")
    mailbox = 'INBOX'
    imap_server.select(mailbox)

    # Search for emails based on your criteria
    typ, data = imap_server.search(None, 'ALL')

    # Fetch the emails
    for num in data[0].split():
        typ, data = imap_server.fetch(num, '(RFC822)')
        raw_email = data[0][1]
        # Process the raw email as needed
        print(raw_email.decode('utf-8'))

    # Logout and close the connection
    imap_server.logout()
```

The `receive_emails` function connects to the IMAP server using the provided server address and port. It logs into the email account using the provided credentials. Then it selects the mailbox (e.g., "INBOX") to fetch emails from. It searches for emails using the `search` method, which can be modified to specify criteria for fetching specific emails. It iterates over the email numbers obtained from the search results and fetches each email using the `fetch` method. The raw email data is extracted from the fetched data and can be further processed as needed. In this example, it is printed to the console.

```
if __name__ == '__main__':
    # Send an email
    send_email('reciever@mail.com', 'Test Subject', 'This is the email body')

    # Receive emails
    receive_emails()
```

In the main section of the code, it first calls the `send_email` function to send an email to the specified recipient with a subject and body. Then it calls the `receive_emails` function to fetch and process emails.

Please note that the code assumes the presence of a file named "creds.txt" with the required server configuration and credentials. Make sure to update the file contents with the actual values before running the code.