Networks Assignment 1 : Socket Programming

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Introduction

This assignment involves programming of a mail server using client server model. The client receives commands from user which then sends it to the server which processes the commands and sends the result back to the client to be displayed to the user. The communication between client and server takes place through a socket to which both have been connected.

Testing and output of code

When the server and client files are run on different terminals according to the instructions given in the README file, the main prompt is run on the client side of the program where we can give instructions which are sent to the server to be processed and the output is sent back to the client.

Testcase 1

Server Terminal

```
rishika@rishika−Yoga−7−14ITL5:~/Networks/ass1$ make
gcc −g −c usercode.c
gcc −g −o usercode usercode.o
gcc −g −c servercode.c
gcc −g −o servercode servercode.o

rishika@rishika−Yoga−7−14ITL5:~/Networks/ass1$ ./servercode
Socket succesfully created.
Server listening.
Server listening.
Server accepted the client.
Server exiting.
```

User Terminal

```
rishika@rishika−Yoga−7−14ITL5:~/Networks/ass1$ ./usercode 127.0.0.1
Socket succesfully created ...
Connected to the server ...
Main−Prompt> Listusers

Main−Prompt> Adduser
Incorrect command.
Main−Prompt> Adduser Rishika
User added .
Main−Prompt> Adduser Harini
User added .
Main−Prompt> Listuser
Incorrect command.
Main−Prompt> Listusers
Rishika Harini
Main−Prompt> Quit
Client exiting .
```

Testcase 2

Server Terminal

```
rishika@rishika−Yoga−7−14ITL5:~/Networks/ass1$ ./servercode
Socket succesfully created .
Server listening .
Server listening .
Server accepted the client .
Server exiting .
```

User Terminal

```
rishika@rishika−Yoga−7−14ITL5:~/Networks/ass1$ ./usercode 127.0.0.1
Socket succesfully created ...
Connected to the server ...
Main−Prompt> Listusers
Rishika Harini
Main−Prompt> Setuser Rishika
User exists and has 0 messages.
Sub−Prompt−Rishika> Read
No more mail .
Sub−Prompt−Rishika> Delte
Incorrect command.
```

Sub–Prompt–Rishika> Delete
No more mail.
Sub–Prompt–Rishika> Send harini
User doesnot exist.
Sub–Prompt–Rishika> Send Harini
Type Message: Subject: Hi
Hi!! How are you...
Its been long since we met..What have you been upto...###
Mail sent.
Sub–Prompt–Rishika> Send Harini
Type Message: Subject: Networks assignment
Are you done with the assignment?###
Mail sent.
Sub–Prompt–Rishika> Send Harini
Type Message: Subject: Report
Could you tell me what is the difference in writing report and README...###
Mail sent.
Sub–Prompt–Rishika> Done
Main–Prompt> Setuser Harini
User exists and has 3 messages.
Sub–Prompt–Harini> Done
Main–Prompt> Quit
Client exiting.

Testcase 3

Server Terminal

rishika@rishika–Yoga–7–14ITL5:~/Networks/ass1$ ./servercode
Socket succesfully created.
Server listening.
Server listening.
Server accepted the client.
Server exiting.

User Terminal

Socket succesfully created...
Connected to the server...
Main–Prompt> Listusers
Rishika Harini
Main–Prompt> Setuser Harini
User exists and has 3 messages.
Sub–Prompt–Harini> Read

From: Rishika
To: Harini
Date: IST Thu Mar 4 19:38:38 2021
Subject: Hi

Hi!! How are you...

Its been long since we met..What have you been upto...

Sub–Prompt–Harini> Read

From: Rishika
To: Harini
Date: IST Thu Mar 4 19:39:40 2021
Subject: Networks assignment

Are you done with the assignment?

Sub–Prompt–Harini> Read

From: Rishika
To: Harini
Date: IST Thu Mar 4 19:40:21 2021
Subject: Report

Could you tell me what is the difference in writing report and README...

Sub–Prompt–Harini> Read
From: Rishika
To: Harini
Date: IST Thu Mar 4 19:38:38 2021
Subject: Hi

Hi!! How are you...

Its been long since we met..What have you been upto...

Sub–Prompt–Harini> Delete
Message deleted.
Sub–Prompt–Harini> Read

From: Rishika
To: Harini
Date: IST Thu Mar 4 19:40:21 2021
Subject: Report

Could you tell me what is the difference in writing report and README...

Sub−Prompt−Harini> Done
Main−Prompt> Quit
Client exiting.

Testcase 4

Server Terminal

```
rishika@rishika−Yoga−7−14ITL5:~/Networks/ass1$ ./servercode
Socket succesfully created.
Server listening.
Server listening.
Server accepted the client.
Server exiting.
```

User Terminal

```
rishika@rishika−Yoga−7−14ITL5:~/Networks/ass1$ ./usercode 127.0.0.1
Socket succesfully created...
Connected to the server...
Main−Prompt> Listusers
Rishika Harini
Main−Prompt> Setuser Harini
User exists and has 2 messages.
Sub−Prompt−Harini> Read
From: Rishika
To: Harini
Date: IST Thu Mar  4 19:38:38 2021
Subject: Hi

Hi!! How are you...

Its been long since we met..What have you been upto...

Sub−Prompt−Harini> Send Harini
Type Message: Subject: Note to self
Finish networks assignment report and make a final check for any errors.###
Mail sent.
Sub−Prompt−Harini> Read

From: Rishika
To: Harini
```

Date: IST Thu Mar 4 19:40:21 2021
Subject: Report

Could you tell me what is the difference in writing report and README...

Sub−Prompt−Harini> Read
From: Harini
To: Harini
Date: IST Thu Mar 4 19:53:27 2021
Subject: Note to self

Finish networks assignment report and make a final check for any errors.

Sub−Prompt−Harini> Done
Main−Prompt> Quit
Client exiting.

Testcase 5

Server Terminal

```
rishika@rishika−Yoga−7−14ITL5:~/Networks/ass1$ ./servercode
Socket succesfully created.
Server listening.
Server listening.
Server accepted the client.
Server exiting.

rishika@rishika−Yoga−7−14ITL5:~/Networks/ass1$ make clean
rm *.txt usercode servercode *.o
```

User Terminal

```
rishika@rishika−Yoga−7−14ITL5:~/Networks/ass1$ ./usercode 127.0.0.1
Socket succesfully created...
Connected to the server...
Main−Prompt> Listusers
Rishika Harini
Main−Prompt> Setuser Harini
User exists and has 3 messages.
Sub−Prompt−Harini> Readmailnum 10
Invalid index.
Sub−Prompt−Harini> Readmailnum 0
Invalid index.
```

Sub−Prompt−Harini> Readmailnum 2

From: Rishika
To: Harini
Date: IST Thu Mar 4 19:40:21 2021
Subject: Report

Could you tell me what is the difference in writing report and README...

Sub−Prompt−Harini> Readmailnum 1
From: Rishika
To: Harini
Date: IST Thu Mar 4 19:38:38 2021
Subject: Hi

Hi!! How are you...

Its been long since we met..What have you been upto...

Sub−Prompt−Harini> Deletemailnum 1
Message deleted.
Sub−Prompt−Harini> Read

From: Rishika
To: Harini
Date: IST Thu Mar 4 19:40:21 2021
Subject: Report

Could you tell me what is the difference in writing report and README...

Sub−Prompt−Harini> Deletemailnum 3
Invalid index.
Sub−Prompt−Harini> Deletemailnum 2
Message deleted.
Sub−Prompt−Harini> Read

From: Rishika
To: Harini
Date: IST Thu Mar 4 19:40:21 2021
Subject: Report

Could you tell me what is the difference in writing report and README...

Sub−Prompt−Harini> Readmailnum 2
Invalid index.
Sub−Prompt−Harini> Readmailnum 1

```
From: Rishika
To: Harini
Date: IST Thu Mar  4 19:40:21 2021
Subject: Report

Could you tell me what is the difference in writing report and README...

Sub−Prompt−Harini> Delete
Message deleted.
Sub−Prompt−Harini> Readmailnum 1
No more mail.
Sub−Prompt−Harini> Deletemailnum 1
No more mail.
Sub−Prompt−Harini> Done
Main−Prompt> Quit
Client exiting.
```

New Features incorporated

I added support for 2 new commands.

Readmailnum $< mail\_num >$

This command prints the mail whose index is given by $mail\_num$. The indexing starts from 1. If index of bigger than number of mails then a message indicating that index is invalid is printed by the client. The pointer then points to the mail following that which was just read. If there are no mails the same is printed.

Deletemailnum $< mail\_num >$

This command deletes the mail whose index is given by $mail\_num$. The indexing starts from 1. If index of bigger than number of mails then a message indicating that index is invalid is printed by the client. The pointer then points to the mail following that which was just read. If there are no mails the same is printed.

1   Learning outcomes of this assignment

Through this assignment, I got an idea about what networks is about and the different aspects of it at a high level. It also helped me get a physical idea of what different components like socket are and how to use them. I also got a grip

on some of the jargon used and what they mean. Through this assignment I faced different issues in file management and also due to consecutive reads and writes leading to unwanted junk reads in some situations. So to enable read of longer messages I managed to learn ways to read junk after every write so that there are no consecutive reads. I also learned about issues that are system specific where it may work on 1 system but not the other. I also got better idea of various aspects of file management.