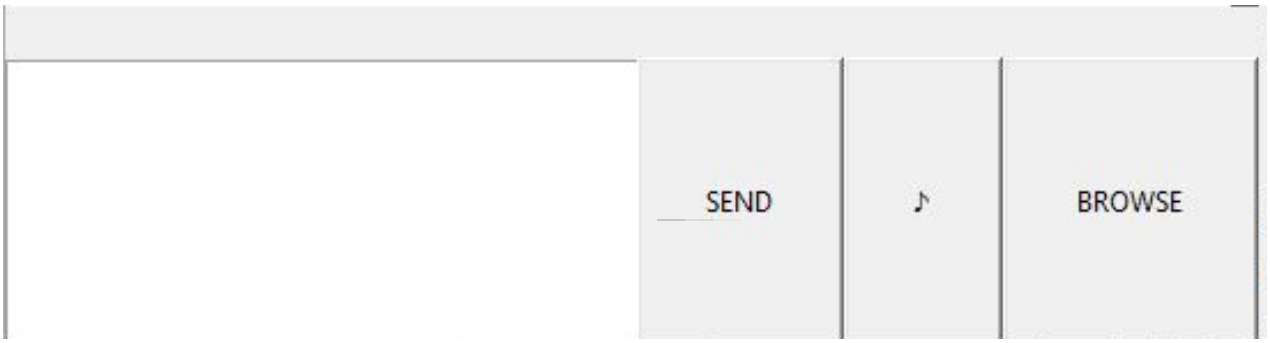
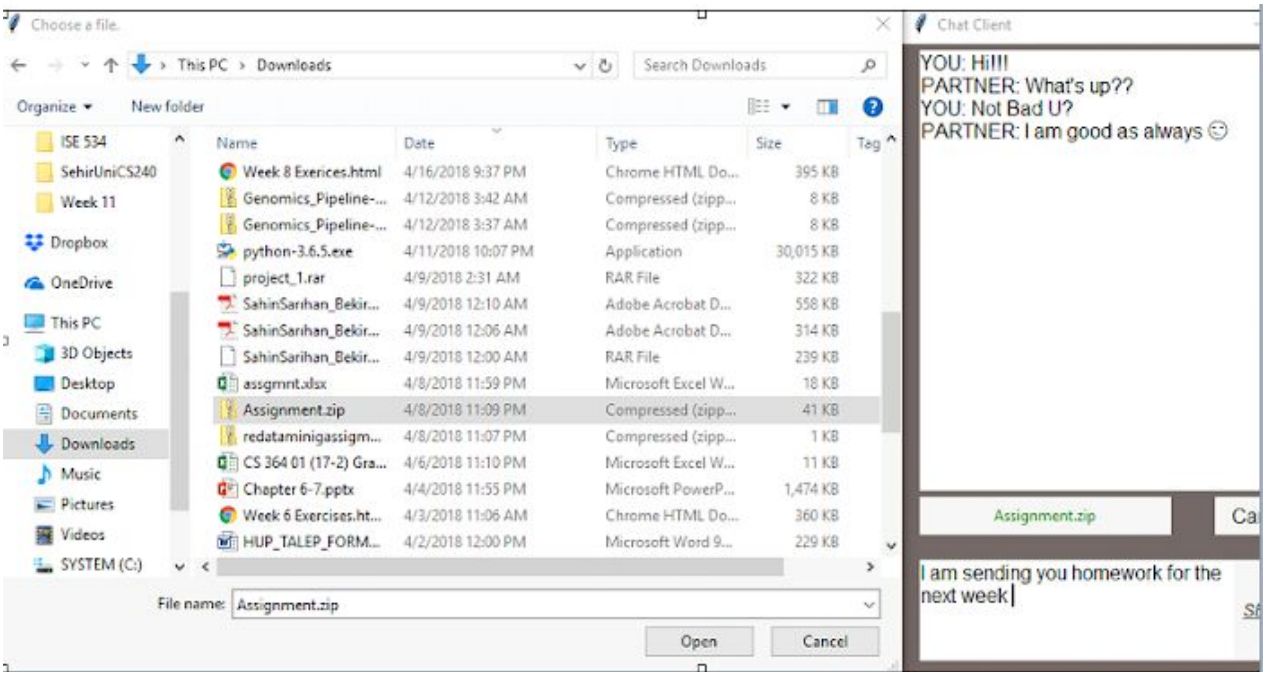
CS364 - Computer Networks

Project 2

The second part of the project will be an extension to the first one and you will add file transfer functionality to your application.

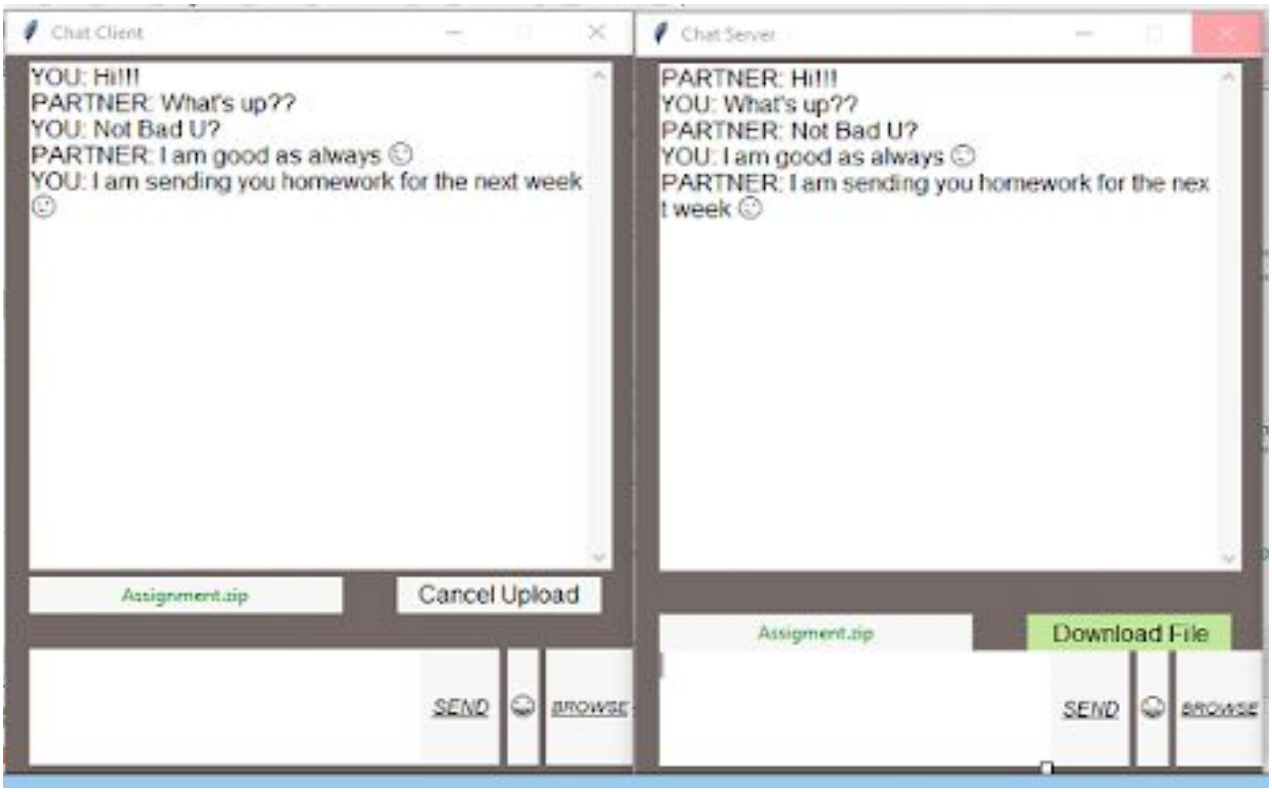
The browse button on the will open a file dialogue to select the file that is to be sent to the partner.





Notes:

1. The name of the selected file appears on both sides.
2. The file transfer does not start until the receiver confirms the transfer by clicking the download button.
3. The sender is able to abort the transfer if the receiver has not started downloading the file.



Part A (30 points):

You should be able to send the file to other side successfully.

Part B (60 points):

When you send a file, you should divide the file into small pieces (1000 bytes) and assign a sequence number to each piece. Then you should send each piece in a single packet. On the receiving end you should combine these pieces to reconstruct the file. With TCP you should not have any lost packets and packets should be received in correct order, but with UDP you might lose packets and

some of the packets might change order. You should report how many packets are lost and how many changed order (try files with different sizes 100KB to 100MB). Moreover report the upload/download rate(bits/seconds) over time.

Part - C (10 points):

Security is an important aspect while sending files over the network. Your application should scan the file that you are sending for potential malware and notify the receiver via message. You can do it via virustotal api. Here is an example code:

```
import requests
url = 'https://www.virustotal.com/vtapi/v2/file/scan'
params = {'apikey': '<apikey>'}
files = {'file': ('myfile.exe', open('myfile.exe', 'rb'))}
response = requests.post(url, files=files, params=params)
print(response.json())
```

All you need to do is create a free account on virustotal.com. After verifying your account, sign in and click on your name at the top right corner. You will see your api key there.

Bonus Part (50 points)

Your file transfer program should add reliability to UDP at the application layer. It should handle packet losses (timeouts, retransmissions) and out-of-order packets (put packets in correct order before processing, buffering).