Rohan Tumma
CSE-BE-B09
DISTRIBUTED SYSTEM

EXP: 5th and 6th

5: Implement concurrent echo client-server application

6: To write Program multi-threaded client/server processes

Server:

```
import _thread as thread
from ChatFns import *


#--------------------------------------------------#
#---------INITIALIZE CONNECTION VARIABLES-----------#
#--------------------------------------------------#
#Initiate socket and bind port to host PC

WindowTitle = 'Rohan Tech - Host'
s = socket(AF_INET, SOCK_STREAM)
HOST = gethostname()
PORT = 8011
conn = ''
s.bind((HOST, PORT))

def ClickAction():
    #Write message to chat window
    EntryText = FilteredMessage(EntryBox.get("0.0",END))
    LoadMyEntry(ChatLog, EntryText)
    #Scroll to the bottom of chat windows
    ChatLog.yview(END)
    #Erace previous message in Entry Box
    EntryBox.delete("0.0",END)

    #Send my mesage to all others
    conn.sendall(EntryText.encode('utf-8'))



#--------------------------------------------------#
#----------------- KEYBOARD EVENTS -----------------#
#--------------------------------------------------#
def PressAction(event):
    EntryBox.config(state=NORMAL)
    ClickAction()
def DisableEntry(event):
    EntryBox.config(state=DISABLED)

#--------------------------------------------------#
#-----------------GRAPHICS MANAGEMENT---------------#
#--------------------------------------------------#
#Create a window
base = Tk()
base.title(WindowTitle)
base.geometry("400x500")
base.resizable(width=FALSE, height=FALSE)
#Create a Chat window
ChatLog = Text(base, bd=0, bg="white", height="8", width="50", font="Arial",)
ChatLog.insert(END, "Waiting for your partner to connect..\n")
ChatLog.config(state=DISABLED)
#Bind a scrollbar to the Chat window
scrollbar = Scrollbar(base, command=ChatLog.yview, cursor="heart")
ChatLog['yscrollcommand'] = scrollbar.set
#Create the Button to send message
SendButton = Button(base, font=30, text="Send", width="12", height=5,
                    bd=0, bg="#eb3434", activebackground="#34ebc0",
                    command=ClickAction)

#Create the box to enter message
EntryBox = Text(base, bd=0, bg="white",width="29", height="5", font="Arial")
EntryBox.bind("<Return>", DisableEntry)
EntryBox.bind("<KeyRelease-Return>", PressAction)
#Place all components on the screen
scrollbar.place(x=376,y=6, height=386)
ChatLog.place(x=6,y=6, height=386, width=370)
EntryBox.place(x=128, y=401, height=90, width=265)
SendButton.place(x=6, y=401, height=90)
def GetConnected():
    s.listen(1)
    global conn
    conn, addr = s.accept()
    LoadConnectionInfo(ChatLog, 'Connected with: ' + str(addr) + '\n-----------------------------------------------
----------------')

    while 1:
        try:
            data = conn.recv(1024)
            LoadOtherEntry(ChatLog, data.decode('utf-8'))
            if base.focus_get() == None:
                FlashMyWindow(WindowTitle)
                playsound('SOUND1.wav')
        except:
            LoadConnectionInfo(ChatLog, '\n [ Your partner has disconnected ]\n [ Waiting for him to conn
ect..] \n  ')
            GetConnected()
    conn.close()

thread.start_new_thread(GetConnected,())
base.mainloop()
```

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Client:

```
import _thread as thread
from ChatFns import *

#--------------------------------------------------#
#---------INITIALIZE CONNECTION VARIABLES-----------#
#--------------------------------------------------#
WindowTitle = 'JChat v0.1 - Client'
HOST = gethostname()
PORT = 8011
s = socket(AF_INET, SOCK_STREAM)
#--------------------------------------------------#
#------------------ MOUSE EVENTS -------------------#
#--------------------------------------------------#
def ClickAction():
   #Write message to chat window
   EntryText = FilteredMessage(EntryBox.get("0.0",END))
   LoadMyEntry(ChatLog, EntryText)
   #Scroll to the bottom of chat windows
   ChatLog.yview(END)
   #Erace previous message in Entry Box
   EntryBox.delete("0.0",END)

   #Send my mesage to all others
   s.sendall(EntryText.encode('utf-8'))
#--------------------------------------------------#
#----------------- KEYBOARD EVENTS -----------------#
#--------------------------------------------------#
def PressAction(event):
   EntryBox.config(state=NORMAL)
   ClickAction()
def DisableEntry(event):
   EntryBox.config(state=DISABLED)

#--------------------------------------------------#
#-----------------GRAPHICS MANAGEMENT---------------#
#--------------------------------------------------#
#Create a window
base = Tk()
base.title(WindowTitle)
base.geometry("400x500")
base.resizable(width=FALSE, height=FALSE)
#Create a Chat window
ChatLog = Text(base, bd=0, bg="white", height="8", width="50", font="Arial",)
ChatLog.insert(END, "Connecting to your Loki..\n")
ChatLog.config(state=DISABLED)
#Bind a scrollbar to the Chat window
scrollbar = Scrollbar(base, command=ChatLog.yview, cursor="heart")
ChatLog['yscrollcommand'] = scrollbar.set
#Create the Button to send message
SendButton = Button(base, font=30, text="Send", width="12", height=5,
                bd=0, bg="#34ebc0", activebackground="#eb3434",
                command=ClickAction)
#Create the box to enter message
EntryBox = Text(base, bd=0, bg="white",width="29", height="5", font="Arial")
```

```
EntryBox.bind("<Return>", DisableEntry)
EntryBox.bind("<KeyRelease-Return>", PressAction)
#Place all components on the screen
scrollbar.place(x=376,y=6, height=386)
ChatLog.place(x=6,y=6, height=386, width=370)
EntryBox.place(x=128, y=401, height=90, width=265)
SendButton.place(x=6, y=401, height=90)
#--------------------------------------------------#
#----------------CONNECTION MANAGEMENT--------------#
#--------------------------------------------------#
def ReceiveData():
    try:
        s.connect((HOST, PORT))
        LoadConnectionInfo(ChatLog, '[ Succesfully connected ]\n--------------------------------------------------------------')
    except:
        LoadConnectionInfo(ChatLog, '[ Unable to connect ]')
        return

    while 1:
        try:
            data = s.recv(1024)
        except:
            LoadConnectionInfo(ChatLog, '\n [ Your partner has disconnected ] \n')
            break
        if data != '':
            LoadOtherEntry(ChatLog, data.decode('utf-8'))
            if base.focus_get() == None:
                FlashMyWindow(WindowTitle)
                playsound('SOUND.wav')

        else:
            LoadConnectionInfo(ChatLog, '\n [ Your partner has disconnected ] \n')
            break
    #s.close()
thread.start_new_thread(ReceiveData,())
base.mainloop()
```

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ChatGUI:

```
from tkinter import *
from socket import *
import urllib
import re
import pygame
import win32gui

def getmixerargs():
    pygame.mixer.init()
    freq, size, chan = pygame.mixer.get_init()
    return freq, size, chan
def initMixer():
    BUFFER = 3072  # audio buffer size, number of samples since pygame 1.8.
    FREQ, SIZE, CHAN = getmixerargs()
    pygame.mixer.init(FREQ, SIZE, CHAN, BUFFER)
def playsound(soundfile):
    """Play sound through default mixer channel in blocking manner.
       This will load the whole sound into memory before playback
    """
    pygame.init()
    pygame.mixer.init()
    sound = pygame.mixer.Sound(soundfile)
    clock = pygame.time.Clock()
    sound.play()
    while pygame.mixer.get_busy():
        clock.tick(1000)
def playmusic(soundfile):
    """Stream music with mixer.music module in blocking manner.
       This will stream the sound from disk while playing.
    """
    pygame.init()
    pygame.mixer.init()
    clock = pygame.time.Clock()
    pygame.mixer.music.load(soundfile)
    pygame.mixer.music.play()
    while pygame.mixer.music.get_busy():
        clock.tick(1000)
def stopmusic():
    """stop currently playing music"""
    pygame.mixer.music.stop()
#HOW TO PLAY SONG:
initMixer()
#playmusic(filename)

def FlashMyWindow(title):
    ID = win32gui.FindWindow(None, title)
    win32gui.FlashWindow(ID,True)
def FlashMyWindow2(title2):
    ID2 = win32gui.FindWindow(None, title2)
    win32gui.FlashWindow(ID2,True)
def GetExternalIP():
    url = "http://checkip.dyndns.org"
    request = urllib.urlopen(url).read()
    return str(re.findall(r"\d{1,3}\.\d{1,3}\.\d{1,3}.\d{1,3}", request))
```

```
def GetInternalIP():
    return str(gethostbyname(getfqdn()))

def FilteredMessage(EntryText):
    """
    Filter out all useless white lines at the end of a string,
    returns a new, beautifully filtered string.
    """
    EndFiltered = ''
    for i in range(len(EntryText)-1,-1,-1):
        if EntryText[i]!='\n':
            EndFiltered = EntryText[0:i+1]
            break
    for i in range(0,len(EndFiltered), 1):
            if EndFiltered[i] != "\n":
                    return EndFiltered[i:]+'\n'
    return ''

def LoadConnectionInfo(ChatLog, EntryText):
    if EntryText != '':
        ChatLog.config(state=NORMAL)
        if ChatLog.index('end') != None:
            ChatLog.insert(END, EntryText+'\n')
            ChatLog.config(state=DISABLED)
            ChatLog.yview(END)
def LoadMyEntry(ChatLog, EntryText):
    if EntryText != '':
        ChatLog.config(state=NORMAL)
        if ChatLog.index('end') != None:
            LineNumber = float(ChatLog.index('end'))-1.0
            ChatLog.insert(END, "Rohan : " + EntryText)
            ChatLog.tag_add("Rohan ", LineNumber, LineNumber+0.4)
            ChatLog.tag_config("Rohan " , foreground="#eb3434", font=("Arial", 18, "bold"))
            ChatLog.config(state=DISABLED)
            ChatLog.yview(END)
def LoadOtherEntry(ChatLog, EntryText):
    if EntryText != '':
        ChatLog.config(state=NORMAL)
        if ChatLog.index('end') != None:
            try:
                LineNumber = float(ChatLog.index('end'))-1.0
            except:
                pass
            ChatLog.insert(END, "Loki: " + EntryText)
            ChatLog.tag_add("Loki ", LineNumber, LineNumber+0.6)
            ChatLog.tag_config("Loki ", foreground="#34ebc0", font=("Arial", 18, "bold"))
            ChatLog.config(state=DISABLED)
            ChatLog.yview(END)
```

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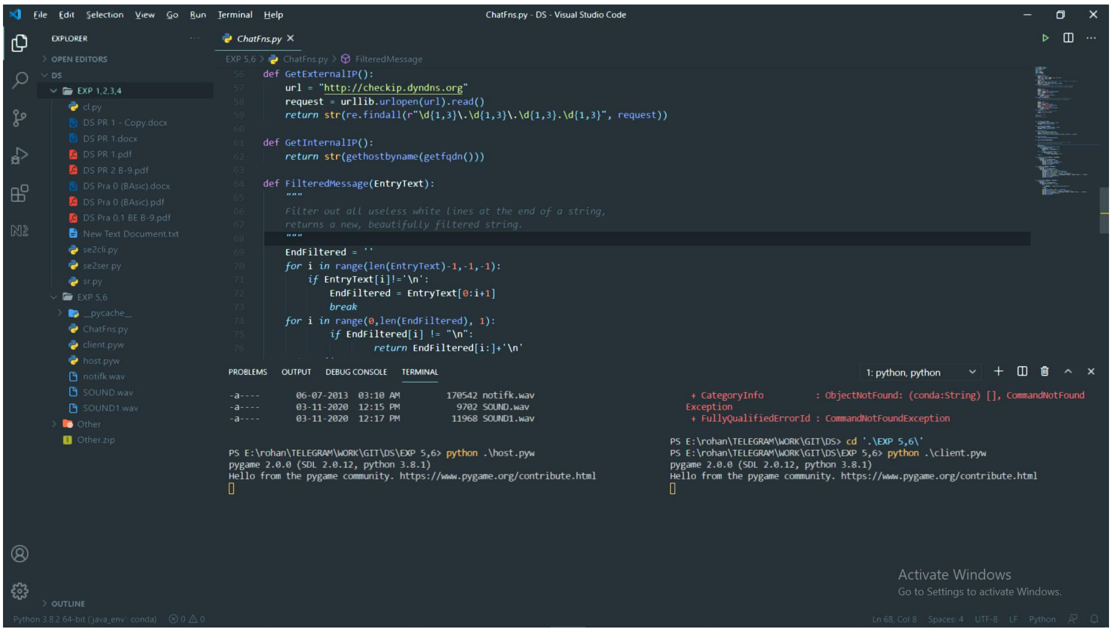
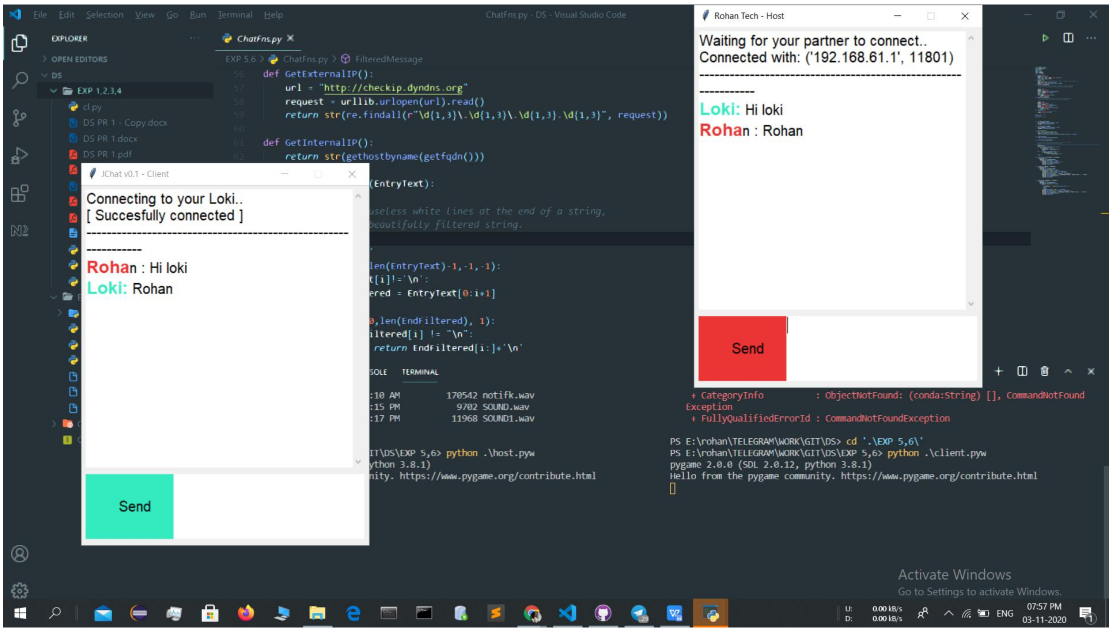
Output:



```python
def GetExternalIP():
    url = "http://checkip.dyndns.org"
    request = urllib.urlopen(url).read()
    return str(re.findall(r"\d{1,3}\.\d{1,3}\.\d{1,3}.\d{1,3}", request))

def GetInternalIP():
    return str(gethostbyname(getfqdn()))

def FilteredMessage(EntryText):
    """
    Filter out all useless white lines at the end of a string,
    returns a new, beautifully filtered string.
    """
    EndFiltered = ''
    for i in range(len(EntryText)-1,-1,-1):
        if EntryText[i]!='\n':
            EndFiltered = EntryText[0:i+1]
            break
    for i in range(0,len(EndFiltered), 1):
            if EndFiltered[i] != "\n":
                    return EndFiltered[i:]+'\n'
```

```
-a----        06-07-2013  03:10 AM         170542 notifk.wav
-a----        03-11-2020  12:15 PM           9702 SOUND.wav
-a----        03-11-2020  12:17 PM          11968 SOUND1.wav

PS E:\rohan\TELEGRAM\WORK\GIT\DS\EXP 5,6> python .\host.pyw
pygame 2.0.0 (SDL 2.0.12, python 3.8.1)
Hello from the pygame community. https://www.pygame.org/contribute.html
```

```
    + CategoryInfo          : ObjectNotFound: (conda:String) [], CommandNotFound
   Exception
    + FullyQualifiedErrorId : CommandNotFoundException

PS E:\rohan\TELEGRAM\WORK\GIT\DS> cd '.\EXP 5,6\'
PS E:\rohan\TELEGRAM\WORK\GIT\DS\EXP 5,6> python .\client.pyw
pygame 2.0.0 (SDL 2.0.12, python 3.8.1)
Hello from the pygame community. https://www.pygame.org/contribute.html
```



JChat v0.1 - Client

Connecting to your Loki..
[Succesfully connected]

Rohan : Hi loki
Loki: Rohan

Rohan Tech - Host

Waiting for your partner to connect..
Connected with: ('192.168.61.1', 11801)

Loki: Hi loki
Rohan : Rohan