INF 01151 - Sistemas Operacionais II
Programming Assignment 1

Team:

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Codebase: https://github.com/GarrenSouza/inf01151_pg-1

Some functions:

```
async def http_handler(path, headers):
    """Route HTTP requests to their handlers"""
    from http import HTTPStatus
    from websockets.http import Headers

    if path == '/ui-chat':
        # Entregar para o navegador o conteúdo do arquivo chat.html,
        # que corresponde ao cliente chat implementado pelo webservice
        with open("chat.html") as f:
            headers = Headers(**{'Content-Type': 'text/html'})
            body = bytes(f.read(), 'utf-8')

            return HTTPStatus.OK, headers, body

    elif path == '/ui-echo':
        # Entregar para o navegador o conteúdo do arquivo echo.html,
        # que corresponde ao cliente echo implementado pelo webservice
        with open("echo.html") as f:
            headers = Headers(**{'Content-Type': 'text/html'})
            body = bytes(f.read(), 'utf-8')

            return HTTPStatus.OK, headers, body

    else:
        return None
```

The following procedure was repeatedly used to update all connected users on the messages received, so we wrapped it in a function to keep the code clean.

```
async def relay_message(message, sessions):
    for socket in sessions.values():
        await socket.send(message)
```

August 6th, 2022

Some logging notation was introduced to provide a more concise view of what was happening with the server (and who was sending what through the chat).

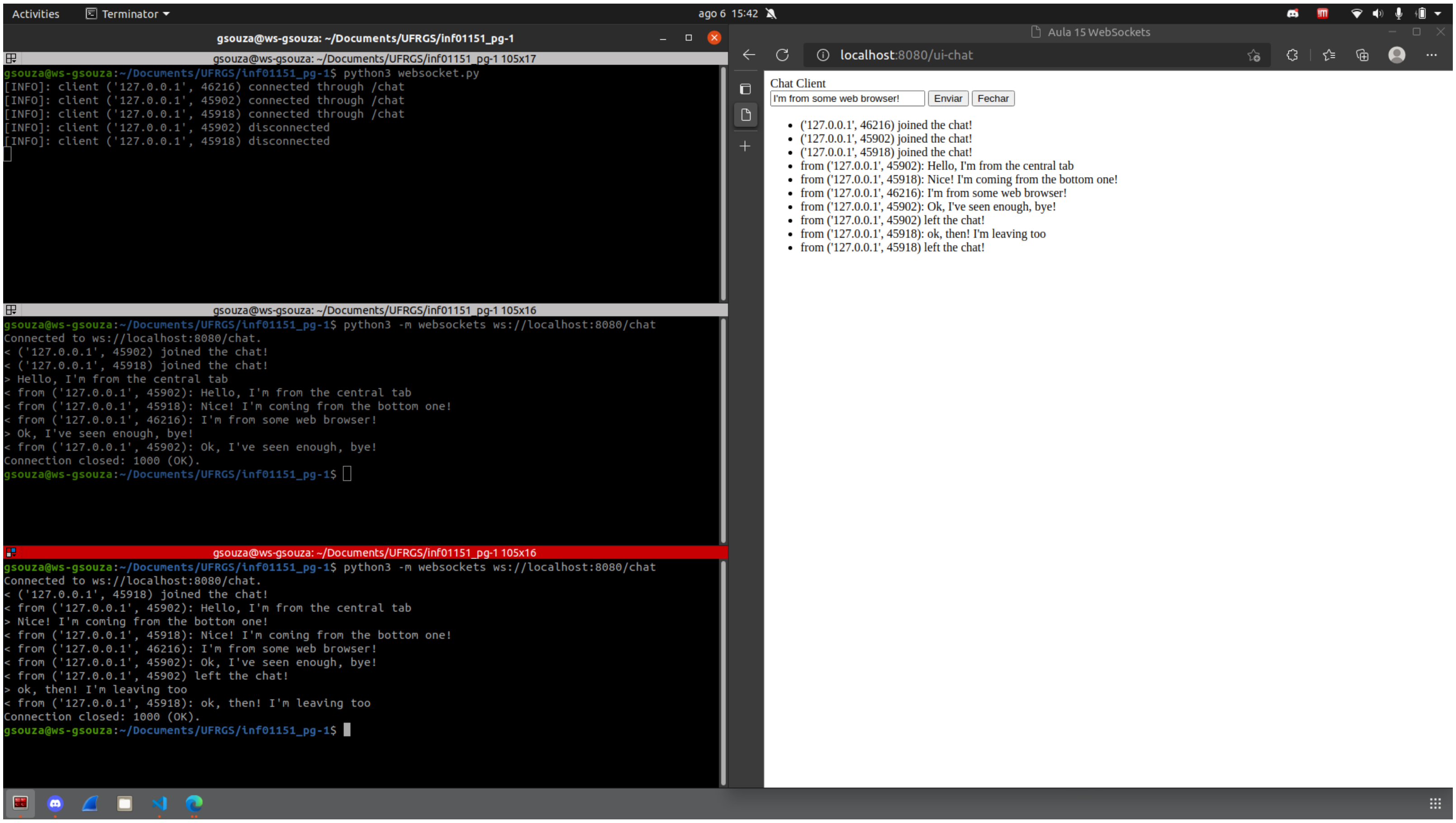
```
async def chat(websocket, sessions={}):
    remote = websocket.remote_address
    sessions[remote] = websocket
    await relay_message(f"{websocket.remote_address} joined the chat!",
sessions)
    try:
        async for message in websocket:
            await relay_message(f"from {websocket.remote_address}:
{message}", sessions)
    finally:
        del sessions[remote]
        print(f"[INFO]: client {websocket.remote_address} disconnected")
        await relay_message(f"from {websocket.remote_address} left the
chat!", sessions)
```

Notice that we are notifying each client about new connections or disconnections (using *relay_message*.

```
async def web_socket_router(websocket, path):
    """Route WebSocket requests to their handlers"""
    if path == '/':
        await websocket.close(reason=f'needs a path')
    elif path == '/echo':
        print(f"[INFO]: client {websocket.remote_address} connected through
/echo")
        await echo(websocket)
    elif path == '/chat':
        print(f"[INFO]: client {websocket.remote_address} connected through
/chat")
        await chat(websocket)
    else:
        await websocket.close(reason=f'path not found: {path}')
```

Screen captures

Still Images:



gsouza@ws-gsouza: ~/Documents/UFRGS/inf01151_pg-1

gsouza@ws-gsouza: ~/Documents/UFRGS/inf01151_pg-1 105x17

```
gsouza@ws-gsouza:~/Documents/UFRGS/inf01151_pg-1$ python3 websocket.py
[INFO]: client ('127.0.0.1', 46216) connected through /chat
[INFO]: client ('127.0.0.1', 45902) connected through /chat
[INFO]: client ('127.0.0.1', 45918) connected through /chat
[INFO]: client ('127.0.0.1', 45902) disconnected
[INFO]: client ('127.0.0.1', 45918) disconnected
```

gsouza@ws-gsouza: ~/Documents/UFRGS/inf01151_pg-1 105x16

```
gsouza@ws-gsouza:~/Documents/UFRGS/inf01151_pg-1$ python3 -m websockets ws://localhost:8080/chat
Connected to ws://localhost:8080/chat.
< ('127.0.0.1', 45902) joined the chat!
< ('127.0.0.1', 45918) joined the chat!
> Hello, I'm from the central tab
< from ('127.0.0.1', 45902): Hello, I'm from the central tab
< from ('127.0.0.1', 45918): Nice! I'm coming from the bottom one!
< from ('127.0.0.1', 46216): I'm from some web browser!
> Ok, I've seen enough, bye!
< from ('127.0.0.1', 45902): Ok, I've seen enough, bye!
Connection closed: 1000 (OK).
gsouza@ws-gsouza:~/Documents/UFRGS/inf01151_pg-1$
```

gsouza@ws-gsouza: ~/Documents/UFRGS/inf01151_pg-1 105x16

```
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Connected to ws://localhost:8080/chat.
< ('127.0.0.1', 45918) joined the chat!
< from ('127.0.0.1', 45902): Hello, I'm from the central tab
> Nice! I'm coming from the bottom one!
< from ('127.0.0.1', 45918): Nice! I'm coming from the bottom one!
< from ('127.0.0.1', 46216): I'm from some web browser!
< from ('127.0.0.1', 45902): Ok, I've seen enough, bye!
< from ('127.0.0.1', 45902) left the chat!
> ok, then! I'm leaving too
< from ('127.0.0.1', 45918): ok, then! I'm leaving too
Connection closed: 1000 (OK).
gsouza@ws-gsouza:~/Documents/UFRGS/inf01151_pg-1$
```

Chat Client

I'm from some web browser! [Enviar] [Fechar]

- ('127.0.0.1', 46216) joined the chat!
- ('127.0.0.1', 45902) joined the chat!
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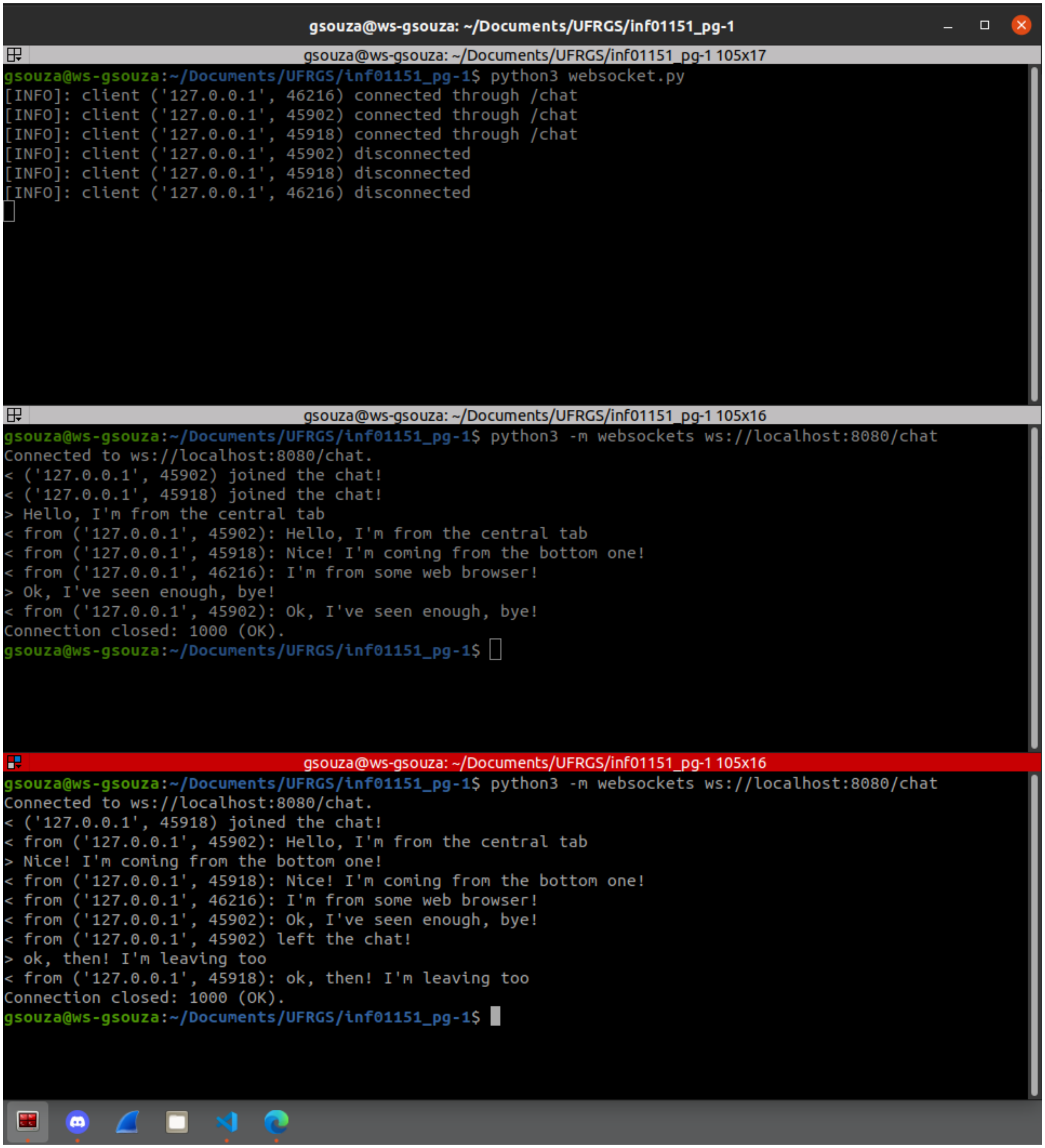
- from ('127.0.0.1', 45918): Nice! I'm coming from the bottom one!
- from ('127.0.0.1', 46216): I'm from some web browser!
- from ('127.0.0.1', 45902): Ok, I've seen enough, bye!
- from ('127.0.0.1', 45902) left the chat!
- from ('127.0.0.1', 45918): ok, then! I'm leaving too
- from ('127.0.0.1', 45918) left the chat!

In the top left we have the server, right below its command prompt we have two CLI clients. On the left we can see a browser instance running. All the clients share the same session and you can identify who's sent each message by just reading the text in each one of the “interfaces”.

After disconnecting from the web browser:


gsouza@ws-gsouza: ~/Documents/UFRGS/inf01151_pg-1
gsouza@ws-gsouza: ~/Documents/UFRGS/inf01151_pg-1 105x17
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[INFO]: client ('127.0.0.1', 45902) connected through /chat
[INFO]: client ('127.0.0.1', 45918) connected through /chat
[INFO]: client ('127.0.0.1', 45902) disconnected
[INFO]: client ('127.0.0.1', 45918) disconnected
[INFO]: client ('127.0.0.1', 46216) disconnected
```

```
gsouza@ws-gsouza:~/Documents/UFRGS/inf01151_pg-1$ python3 -m websockets ws://localhost:8080/chat
Connected to ws://localhost:8080/chat.
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Connection closed: 1000 (OK).
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```

Notice the last line in the server command prompt (a third disconnection, just as expected)