NFL Socket Programming Project

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CYSE 250

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Problem Statements: When deciding to create this program, my goal was to design a simple server capable of quickly gathering information on NFL league MVP statistics. Rather than navigating multiple websites for various information, my program shortens the process. Users can effortlessly input the desired year, instantly revealing the MVP of that season along with the pivotal statistics that secured their award. Although the current program focuses on the most prominent player stats, it's flexible and can be easily tailored to incorporate additional categories for a more detailed experience. The biggest problem I had developing this program was mastering the communication between the server and the client. It took a while to get the server working to where it displays the statistics after the user year entry, and it involved a lot of checking the indentations in my code to get it working properly.

Hardware/Software Used: I utilized my Lenovo Legion Laptop to create the program, and my laptop currently runs Windows 11 Operating System with a 64-bit OS. The application I used to construct the code was the same Python IDLE application we've been using throughout the semester.

Results: Order: Server Code 1, Server Code 2, Client Code, Results. For the code, I utilized a dictionary to store the player's information. I utilized a defined function and if statements to ensure the client is inputting a valid year. If a valid year is chosen, a for loop is called which will loop through the stat and value as defined in the dictionary to display the proper statistics.

```python
import socket

HOST = 'localhost'
PORT = 5002
BUFSIZE = 1024
ADDRESS = (HOST, PORT)

nfl_mvp_data = {
    2000: {'MVP': 'Marshall Faulk', 'Rushing Yards': 1359, 'Rushing Touchdowns': 18, 'Receiving Yards': 830, 'Receiving Touchdowns': 8},
    2001: {'MVP': 'Kurt Warner', 'Passing Yards': 4830, 'Passing Touchdowns': 36, 'Interceptions': 22},
    2002: {'MVP': 'Rich Gannon', 'Passing Yards': 4689, 'Passing Touchdowns': 26, 'Interceptions': 10},
    2003: {'MVP': 'Peyton Manning', 'Passing Yards': 4267, 'Passing Touchdowns': 29, 'Interceptions': 10},
    2004: {'MVP': 'Peyton Manning', 'Passing Yards': 4557, 'Passing Touchdowns': 49, 'Interceptions': 10},
    2005: {'MVP': 'Shaun Alexander', 'Rushing Yards': 1880, 'Rushing Touchdowns': 27, 'Receiving Yards': 28, 'Receiving Touchdowns': 1},
    2006: {'MVP': 'LaDanian Tomlinson', 'Rushing Yards': 1815, 'Rushing Touchdowns': 28, 'Receiving Yards': 508, 'Receiving Touchdowns': 3},
    2007: {'MVP': 'Tom Brady', 'Passing Yards': 4806, 'Passing Touchdowns': 50, 'Interceptions': 8},
    2008: {'MVP': 'Peyton Manning', 'Passing Yards': 4002, 'Passing Touchdowns': 27, 'Interceptions': 12 },
    2009: {'MVP': 'Peyton Manning', 'Passing Yards': 4500, 'Passing Touchdowns': 33, 'Interceptions': 16},
    2010: {'MVP': 'Tom Brady', 'Passing Yards': 3900, 'Passing Touchdowns': 36, 'Interceptions': 4},
    2011: {'MVP': 'Aaron Rodgers', 'Passing Yards': 4643, 'Passing Touchdowns': 45, 'Interceptions': 6},
    2012: {'MVP': 'Adrian Peterson', 'Rushing Yards': 2097, 'Rushing Touchdowns': 12, 'Receiving Yards': 217, 'Receiving Touchdowns': 1},
    2013: {'MVP': 'Peyton Manning', 'Passing Yards': 5477, 'Passing Touchdowns': 55, 'Interceptions': 10},
    2014: {'MVP': 'Aaron Rodgers', 'Passing Yards': 4381, 'Passing Touchdowns': 38, 'Interceptions': 5},
    2015: {'MVP': 'Cam Newton', 'Passing Yards': 3837, 'Passing Touchdowns': 35, 'Rushing Yards': 646, 'Rushing Touchdowns': 10, 'Interceptions': 10},
    2016: {'MVP': 'Matt Ryan', 'Passing Yards': 4944, 'Passing Touchdowns': 38, 'Interceptions': 7},
    2017: {'MVP': 'Tom Brady', 'Passing Yards': 4577, 'Passing Touchdowns': 32, 'Interceptions': 8},
    2018: {'MVP': 'Patrick Mahomes', 'Passing Yards': 5097, 'Passing Touchdowns': 50, 'Interceptions': 12},
    2019: {'MVP': 'Lamar Jackson', 'Passing Yards': 3127, 'Passing Touchdowns': 36, 'Rushing Yards': 1206, 'Rushing Touchdowns': 7, 'Interceptions': 6},
    2020: {'MVP': 'Aaron Rodgers', 'Passing Yards': 4299, 'Passing Touchdowns': 48, 'Interceptions': 5},
    2021: {'MVP': 'Aaron Rodgers', 'Passing Yards': 4115, 'Passing Touchdowns': 37, 'Interceptions': 4},
    2022: {'MVP': 'Patrick Mahomes', 'Passing Yards': 5250, 'Passing Touchdowns': 41, 'Interceptions': 12},

}


def process_client_message(client, message):
    if not message:
        print('Client Disconnected')
        client.close()
    elif message.lower() == 'quit':
        print('Client requested to exit')
        client.close()
    elif message.isdigit():
        year = int(message)
        if year in nfl_mvp_data:
            reply = f"NFL MVP in {year}: {nfl_mvp_data[year]['MVP']}\n" \
                    f"Statistics:\n"
```

```python
def process_client_message(client, message):
    if not message:
        print('Client Disconnected')
        client.close()
    elif message.lower() == 'quit':
        print('Client requested to exit')
        client.close()
    elif message.isdigit():
        year = int(message)
        if year in nfl_mvp_data:
            reply = f"NFL MVP in {year}: {nfl_mvp_data[year]['MVP']}\n" \
                    f"Statistics:\n"
            for stat, value in nfl_mvp_data[year].items():
                if stat != 'MVP':
                    reply += f"{stat}: {value}\n"
            client.sendall(reply.encode())
        else:
            error_message = f"No data available for NFL MVP in {year}"
            client.sendall(error_message.encode())
    else:
        error_message = "Invalid input. Please enter a valid year (2000-2022) or 'exit' to quit."
        client.sendall(error_message.encode())

server = socket.socket()
server.bind(ADDRESS)
server.listen()

while True:
    print('Waiting for connection ...')
    (client, address) = server.accept()
    print('Connecting from:', address)
    client.send('Welcome to the server '.encode())

    while True:
        client.sendall('Enter a year from 2000-2022 to view the NFL league MVP and their statistics, or type quit to exit: '.encode())
        message = client.recv(BUFSIZE).decode()
        process_client_message(client, message)
```

SocketfromhomeCLIENT.py - C:\Users\chand\OneDrive\Documents\College Classes\C'

File   Edit   Format   Run   Options   Window   Help

```python
import socket

HOST = 'localhost'
PORT = 5002
BUFSIZE = 1024
ADDRESS = (HOST, PORT)

client = socket.socket()
client.connect(ADDRESS)
print(client.recv(BUFSIZE).decode())

while True:
    year_input = input('> ')
    client.sendall(year_input.encode())

    if year_input.lower() == 'quit':
        print('Exiting...')
        break

    response = client.recv(BUFSIZE).decode()
    print(response)
    print()
```

Left Window (Server)

```
IDLE Shell 3.11.5
File  Edit  Shell  Debug  Options  Window  Help

Python 3.11.5 (tags/v3.11.5:cce6ba9, Aug 24 2023, 14:38:34) [MSC v.1936 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\chand\OneDrive\Documents\College Classes\CYSE 250\Socket Pro
gramming\Official Server.py
Waiting for connection ...
Connecting from: ('127.0.0.1', 58651)
Client requested to exit
Traceback (most recent call last):
  File "C:\Users\chand\OneDrive\Documents\College Classes\CYSE 250\Socket Progra
mming\Official Server.py", line 70, in <module>
    client.sendall('Enter a year from 2000-2022 to view the NFL league MVP and t
heir statistics, or type quit to exit: '.encode())
OSError: [WinError 10038] An operation was attempted on something that is not a
socket
>>>
```

Ln: 12 Col: 0

Right Window (Client)

```
IDLE Shell 3.11.5
File  Edit  Shell  Debug  Options  Window  Help

Python 3.11.5 (tags/v3.11.5:cce6ba9, Aug 24 2023, 14:38:34) [MSC v.1936 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\chand\OneDrive\Documents\College Classes\CYSE 250\Socket Pro
gramming\SocketfromhomeCLIENT.py
Welcome to the server
>
Enter a year from 2000-2022 to view the NFL league MVP and their statistics, or
type quit to exit:

> 2001
NFL MVP in 2001: Kurt Warner
Statistics:
Passing Yards: 4830
Passing Touchdowns: 36
Interceptions: 22


>
Enter a year from 2000-2022 to view the NFL league MVP and their statistics, or
type quit to exit:

> 2009
NFL MVP in 2009: Peyton Manning
Statistics:
Passing Yards: 4500
Passing Touchdowns: 33
Interceptions: 16


>
Enter a year from 2000-2022 to view the NFL league MVP and their statistics, or
type quit to exit:

> quit
Exiting...
>>>
```

Ln: 28 Col: 0