Python Project

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What is the Objective of the Project?

- Server and client programs in Python
- Returns the capital of any country or territory in North America
- Allows the user to learn the capital of specified location
- Allows for repeated use without disconnecting

Hardware and Software Used to Solve Problem

- Written on Dell Inspiron 7415 laptop
- AMD Ryzen 5 5500 cpu with Radeon 2100 graphics card and 16GB of RAM
- Laptop runs windows 10
- Python version 3.10 with Pycharm as interpreter

Code Server Program:

```python
from socket import *
from time import *

HOST = "LocalHost"
PORT = 5000
BUFSIZE = 1024
ADDRESS = (HOST, PORT)

server = socket(AF_INET, SOCK_STREAM)
server.bind(ADDRESS)
server.listen(3)
while True:
    print("Waiting to connect")  # prints while waiting for client
    (client, address) = server.accept()  # accepts the client
    print("Connecting")
    client.send("Welcome, please input any country or territory in North America to get its capital".encode())  # sends instructions
    while True:
        countryList = (client.recv(BUFSIZE)).decode()  # decodes message
if not countryList:
    print("Disconnected")  # if not a proper input than it disconnects and closes
    client.close()
    break
else:
    countries = {"united states": 0, "canada": 1, "mexico": 2, "anguilla": 3, "antigua and barbuda": 4, "aruba": 5, "the bahamas": 6, "ba
    # is a dictionary of all countries and territories in North America along with a number

    capitals = ["Washington DC", "Ottawa", "Mexico City", "The Vally", "St. John's", "Oranjestad", "Nassau", "Bridgetown", "Belmopan", "H
    # is a list of all capitals, with place in list reflecting number in dictionary

    countryList2 = countryList.lower()  # converts message to lowercase
    number = countries.get(countryList2)  # compares message to dictionary and assigns the number
    output = capitals[number]  # runs number through list to assign capital to output
    client.send(output.encode())  # sends and encodes output
```

Code Client Program

```python
import socket
BUFSIZE = 1024
HOST = "localhost"
PORT = 5000
ADDRESS = (HOST, PORT)
soc=socket.socket()
soc.connect(ADDRESS)  # connects to host
print(soc.recv(BUFSIZE).decode())  # gets and decodes message
while True:
    countries = input("Enter country here (press enter without typing anything to exit): ")  # instructions
    if not countries:  # if a bad input it breaks
        break
    soc.send(countries.encode())  # sends encoded message to host
    output = (soc.recv(BUFSIZE)).decode()  # gets and decodes response
    if not output:
        print("Disconnected")  # if a bad output, break
        break
    print(output)  # if a good output, print
soc.close()
```

Code Step by Step

- Server starts, with client than connecting to server
- Server sends client instructions
- Client allows user to type in name of location
- Users input sent to server, which than compares input to country dictionary
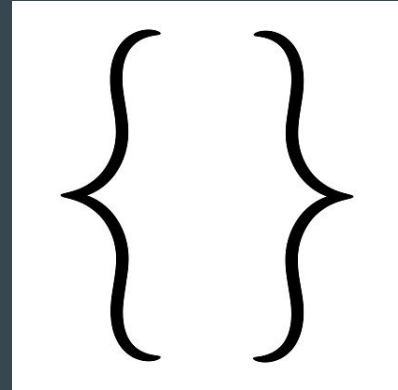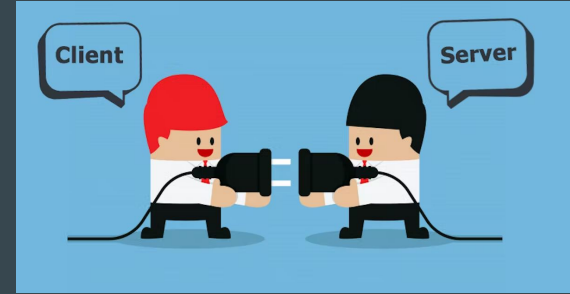
Code Step by Step Cont.

- Dictionary returns number associated with country
- Number is used to pull from capitals list
- Capital is than sent to client and printed
- Loop allows for user to enter another input or quit
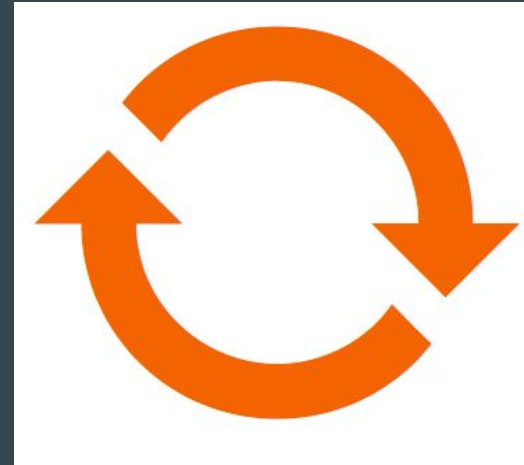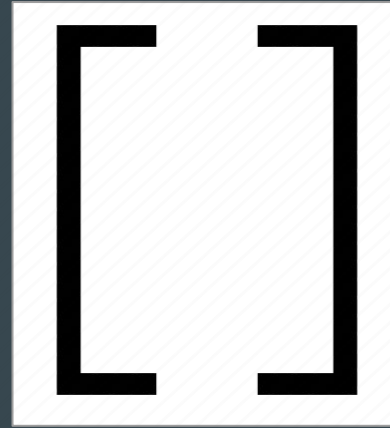
Output of Code

```
Welcome, please input any country or territory in North America to get its capital
Enter country here (press enter without typing anything to exit): united states
Washington DC
Enter country here (press enter without typing anything to exit):


Process finished with exit code 0
```

```
Welcome, please input any country or territory in North America to get its capital
Enter country here (press enter without typing anything to exit): mexico
Mexico City
Enter country here (press enter without typing anything to exit): canada
Ottawa
Enter country here (press enter without typing anything to exit): cuba
Havana
```

Importance of Code

- Dictionary and list needed to return correct capital
- Loops allow repeated use
- Socket functions connect server and client
- Program is ready for use