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180905134 CSE C-23
DS LAB END SEM

1. Write a socket program in python using TCP :

   Client should send a number to the server. Server should find the sum of even digits and return the result to the client.

   Used threading so that multiple clients can send a number to the server
   SERVER CODE
   server.py

```
import threading
import socket


def sumOfEvenDigitsFunc(connector, addr):
    num = int(connector.recv(1024).decode())
    sumOfEvenDigits = 0
    print("Port %s has sent the number %d" % (str(addr[1]), num))
    print("Calculating sum of even digits of the number %d.." %
(num))

    while (num != 0):
        dig = num % 10
        if(dig % 2 == 0):
            sumOfEvenDigits = sumOfEvenDigits + (num % 10)
        num = num//10
    print("Calculation done..\nSending result back to client")
    connector.send(str(sumOfEvenDigits).encode())
    print("Closing connection with client ", (str(addr)))
    connector.shutdown(socket.SHUT_RDWR)
    connector.close()


def serverFunc(port=8000):
    server = socket.socket()
    server.bind(('127.0.0.1', port))
    server.listen(5)
    print('Waitiing for a Connection..')
    while True:
        client_conn, client_addr = server.accept()
        print("Got a connection from %s" % str(client_addr))
        current_thread = threading.Thread(
```

```
            target=sumOfEvenDigitsFunc,
            args=(client_conn, client_addr))
        current_thread.start()


if __name__ == '__main__':
    serverFunc(port=8999)
```

CLIENT CODE

client.py

```
import socket


def clientFunc(port=8000):
    s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
    n = input(str("Enter a number whose sum of even digits you
want: "))
    s.connect(('127.0.0.1', port))
    s.send(str(n).encode())
    sumOfEvenDigits = s.recv(1024).decode()
    print("Received data from the server..")
    print('Sum of even digits:', sumOfEvenDigits)
    s.close()


if __name__ == '__main__':
    clientFunc(port=8999)
```

Screenshots:

Input: 36712, Output 8

Server side:

```
TERMINAL    OUTPUT    PROBLEMS    DEBUG CONSOLE
sanskaar@sanskaar-Lenovo-ideapad-330-15IKB:~/6th Sem Labs/DS Lab/endsem
$ python3 server.py
Waitiing for a Connection..
Got a connection from ('127.0.0.1', 55562)
Port 55562 has sent the number 36712
Calculating sum of even digits of the number 36712..
Calculation done..
Sending result back to client
Closing connection with client  ('127.0.0.1', 55562)
```

Client side:

```
sanskaar@sanskaar-Lenovo-ideapad-330-15IKB:~/6th Sem Labs/DS Lab/endsem
$ python3 client.py
Enter a number whose sum of even digits you want: 36712
Received data from the server..
Sum of even digits: 8
sanskaar@sanskaar-Lenovo-ideapad-330-15IKB:~/6th Sem Labs/DS Lab/endsem
$
```

When Input: 2413, Output 6
Using the same running server!

```
sanskaar@sanskaar-Lenovo-ideapad-330-15IKB:~/6th Sem Labs/DS Lab/endsem
$ python3 server.py
Waitiing for a Connection..
Got a connection from ('127.0.0.1', 55562)
Port 55562 has sent the number 36712
Calculating sum of even digits of the number 36712..
Calculation done..
Sending result back to client
Closing connection with client  ('127.0.0.1', 55562)
Got a connection from ('127.0.0.1', 55568)
Port 55568 has sent the number 2413
Calculating sum of even digits of the number 2413..
Calculation done..
Sending result back to client
Closing connection with client  ('127.0.0.1', 55568)
```

Client side:

```
sanskaar@sanskaar-Lenovo-ideapad-330-15IKB:~/6th Sem Labs/DS Lab/endsem
$ python3 client.py
Enter a number whose sum of even digits you want: 2413
Received data from the server..
Sum of even digits: 6
```

2.Write a map reduce program that returns the total number of confirmed Covid cases for each Country/ Region in the dataset covid_data_lab_ds.csv

itemmap.py

```
import pandas as pd
df = pd.read_csv("covid_data_lab_ds.csv")

for i, place in enumerate(df['Country/Region']):
   print(f"{place}\t{df['Confirmed'][i]}")
```

itemred.py

```
import sys

current_country = None
current_confirmed = 0
country = None
print("Country", "Total confirmed cases")
for data in sys.stdin:
   data = data.strip()
   country, confirmed = data.split('\t', 1)
   if country == 'nan':
       continue
   try:
       confirmed = float(confirmed)
   except ValueError:
       continue
   if current_country == country:
       current_confirmed += confirmed
   else:
       if current_country is not None:
           print(current_country, current_confirmed)
       current_confirmed = confirmed
       current_country = country
if current_country == country:
   print(current_country, current_confirmed)
```

Screenshot:

```
sanskaar@sanskaar-Lenovo-ideapad-330-15IKB:~/6th Sem Labs/DS Lab/endsem$ python3 itemmap.py | sort | python3 itemred.py
Country Total confirmed cases
Australia 48.0
Brazil 141506.0
Canada 663.0
Colombia 101.0
Germany 3119.0
Hong Kong 65.0
Italy 1357.0
Japan 280.0
Macau 46.0
Mainland China 91954.0
Mexico 18570.0
Peru 1502.0
Russia 14368.0
Taiwan 52.0
Ukraine 170.0
United Arab Emirates 4.0
US 42.0
```