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Sem : VI B
DS LAB END SEM

Q1 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.

Client.py:

```
import socket
import sys

# host and port number to connect to

HOST = '127.0.0.1'
PORT = 12000

p = int(input("Enter number to send :> "))

if __name__ == '__main__':
   # make a tcp socket
   s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
   # tcp connect client
   s.connect((HOST, PORT))
   s.send(bytes(str(p), 'utf-8'))  # send the data to the server
in form of bytes
   sum_result = s.recv(
       1024
   ).decode()  # receive the result of the operation from the
server
   print(f"The sum of the even digits : {sum_result}\n")
   # closing connection
```

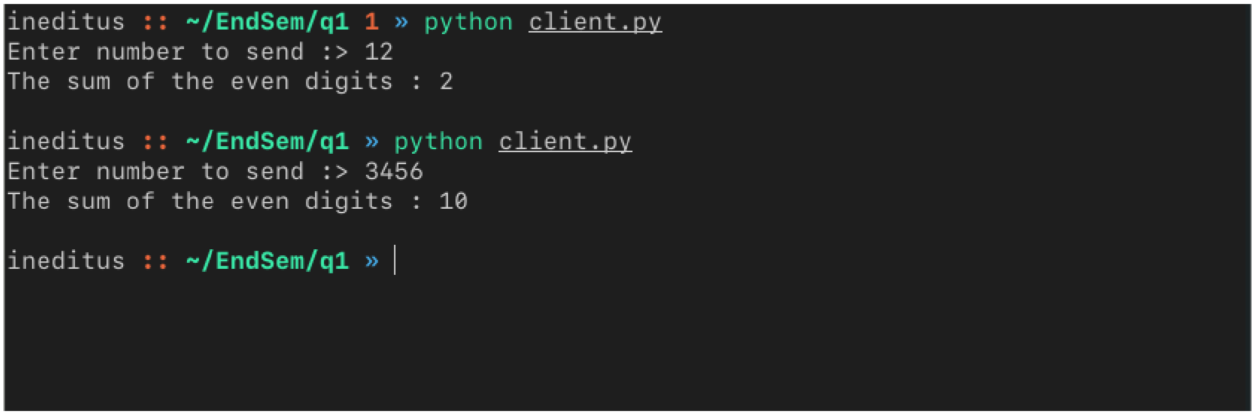
```
    s.close()
```

Server.py

```
import socket

HOST = '127.0.0.1'   # localhost
PORT = 12000         # Port number to listen

with socket.socket(socket.AF_INET, socket.SOCK_STREAM) as s:
    s.bind((HOST, PORT))
    s.listen()
    conn, addr = s.accept()
    with conn:
        #checking the given cond
        print('Connected from:', addr)
        while True:
            data = conn.recv(1024)
            if not data:
                break

            even_sum = 0
            invalid = False
            data = str(data.decode())

            for ch in data:
                #iterating through each character in sent data
                try:
                    if int(ch) % 2 == 0:
                        even_sum += int(ch)
                except ValueError:
                    invalid = True
                    break
            even_sum = str(even_sum) #converting to string before sending and encdoing them
            if invalid:
                conn.sendall(str("invalid Data").encode())
                print("Invalid Data Recieved")
            else:
                conn.sendall(even_sum.encode())
                print("Even Sum of Digits returned")
```

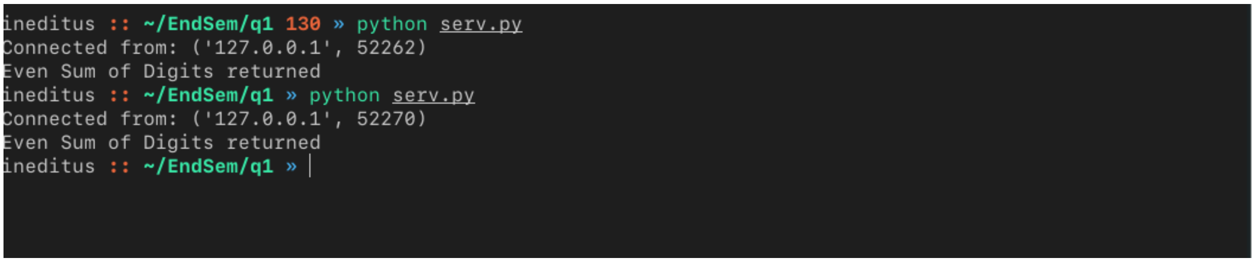
Screenshots:

Client side



```
ineditus :: ~/EndSem/q1 1 » python client.py
Enter number to send :> 12
The sum of the even digits : 2

ineditus :: ~/EndSem/q1 » python client.py
Enter number to send :> 3456
The sum of the even digits : 10

ineditus :: ~/EndSem/q1 »
```

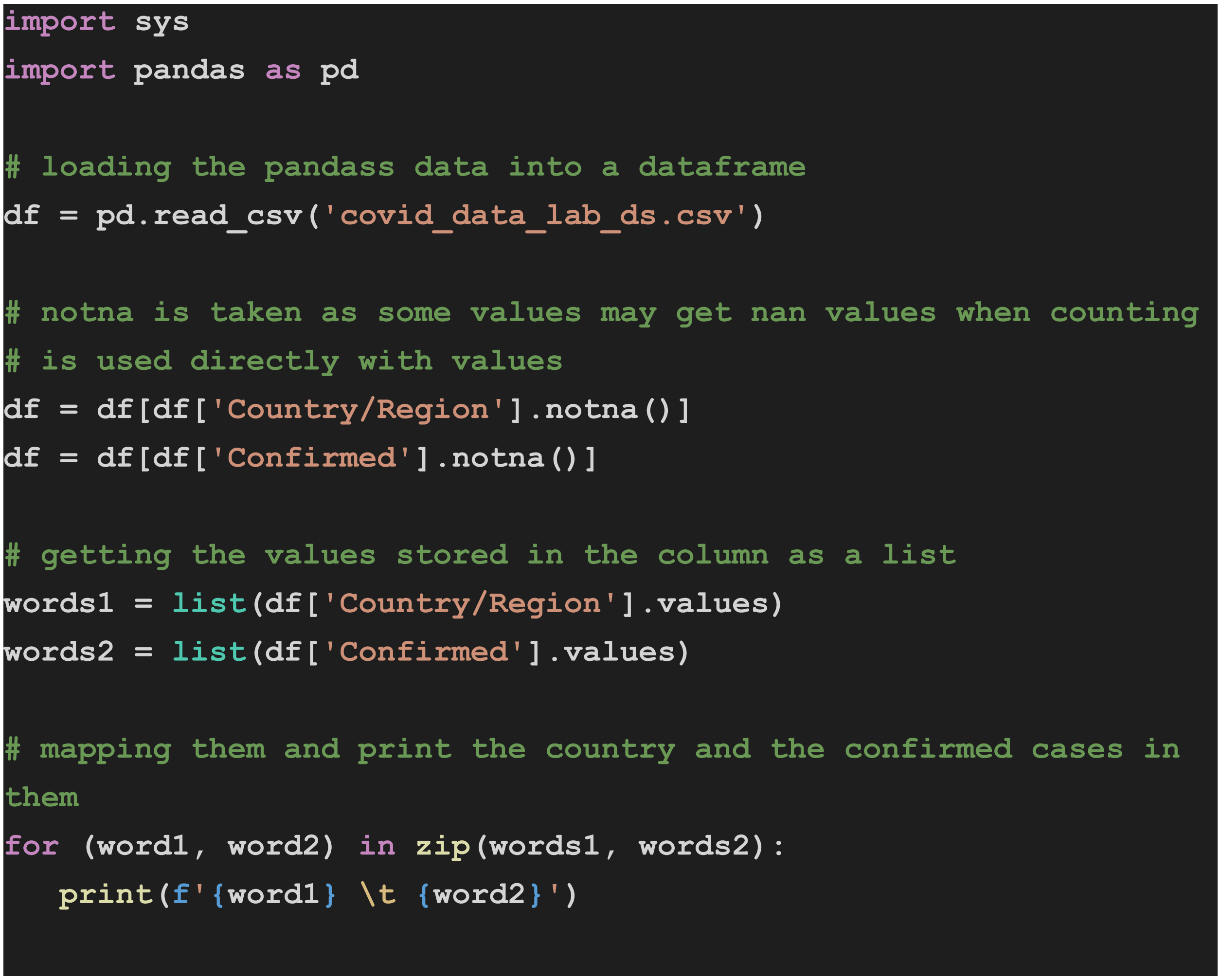
Server side:



```
ineditus :: ~/EndSem/q1 130 » python serv.py
Connected from: ('127.0.0.1', 52262)
Even Sum of Digits returned
ineditus :: ~/EndSem/q1 » python serv.py
Connected from: ('127.0.0.1', 52270)
Even Sum of Digits returned
ineditus :: ~/EndSem/q1 » |
```

Q2 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

Mapper.py

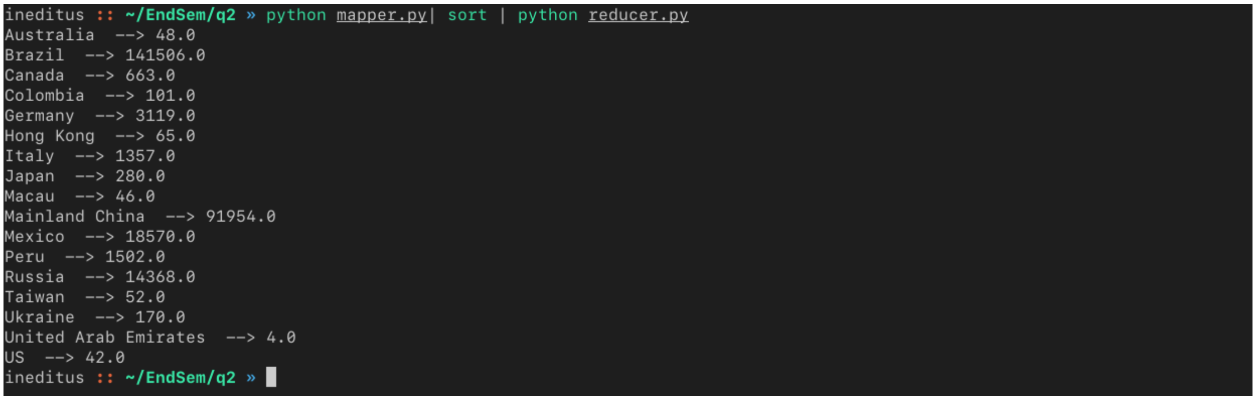


```
import sys
import pandas as pd

# loading the pandass data into a dataframe
df = pd.read_csv('covid_data_lab_ds.csv')

# notna is taken as some values may get nan values when counting
# is used directly with values
df = df[df['Country/Region'].notna()]
df = df[df['Confirmed'].notna()]

# getting the values stored in the column as a list
words1 = list(df['Country/Region'].values)
words2 = list(df['Confirmed'].values)

# mapping them and print the country and the confirmed cases in
them
for (word1, word2) in zip(words1, words2):
   print(f'{word1} \t {word2}')
```

Reducer.py

```python
import fileinput

total_value = 0
old_key = None

# readin lines from stdin
for line in fileinput.input():
    data = line.strip().split("\t")
    if len(data) != 2:
        continue

    # extracting country along with cases being displayed
    current_key, current_value = data

    # if the country is cahnged then print the country with the cases
    if old_key and old_key != current_key:
        print(f"{old_key} --> {float(total_value)}")
        old_key = current_key
        total_value = 0
    # else keep the country same , these will be printed at last
    old_key = current_key

    total_value = total_value + float(current_value)

# print the cases per country
if old_key != None:
    print(f"{old_key} --> {float(total_value)}")
```

Screenshots:



```
ineditus :: ~/EndSem/q2 » python mapper.py| sort | python reducer.py
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
ineditus :: ~/EndSem/q2 » 
```