

PDN HW 1

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January 22, 2020

1 Problem 1

Source code (also turned in as a separate file, UDP_Multiplier_Client.py)

```
from socket import *
from datetime import datetime

# sends the message
# - wait up to one second for a reply
# - - resend if timeout
# - resend on error
# print what happens on each attempt to std_out
def send_message(socket, message, server):
    time_start = datetime.now()
    try:
        # this blocks until success, throws timeout on error
        socket.sendto(message.encode(), server)
        # get the response
        response, server_address = socket.recvfrom(2048)
        response = response.decode()
        if response == 'Incorrect sum':
            print('Server Error, ' + \
                  'RTT = ' + str(datetime.now() - time_start))
            send_message(socket, message, server)    # try again
        else:
            print('Result = ' + str(response) + ' '\
                  'RTT = ' + str(datetime.now() - time_start))
            return(response)
    except timeout:
        print('Request timed out')
        send_message(socket, message, server)        # try again

# init UDP object to send
client_socket = socket(AF_INET, SOCK_DGRAM)

# init servername, port, numbers from user
server_name = input('Input server name: ')
server_port = input('Input server port: ')
num_a       = input('Input first number to multiply: ')
num_b       = input('Input second number to multiply: ')

message = 'Multiply ' \
          + str(num_a) + ' ' + str(num_b) + ' ' + str(num_a+num_b) + ' '\
          + str(datetime.now())
```

```
client_socket.settimeout(1.0)
```

```
send_message(client_socket , message , (server_name , int(server_port)))
```

```
client_socket.close()
```

Ping comparison screenshot:

```
Command Prompt
C:\Users\Jack\College\Spring2020\CS5473\HW1>python UDP_Multiplier_Client.py
Input server name: 127.0.0.1
Input server port: 12000
Input first number to multiply: 402
Input second number to multiply: 12
Result = 4824 RTT = 0:00:00

C:\Users\Jack\College\Spring2020\CS5473\HW1>python UDP_Multiplier_Client.py
Input server name: 34.68.41.35
Input server port: 12000
Input first number to multiply: 52
Input second number to multiply: 3
Request timed out
Result = 156 RTT = 0:00:00.046843

C:\Users\Jack\College\Spring2020\CS5473\HW1>python UDP_Multiplier_Client.py
Input server name: 35.186.147.8
Input server port: 12000
Input first number to multiply: 20
Input second number to multiply: 3
Result = 60 RTT = 0:00:00.226394

C:\Users\Jack\College\Spring2020\CS5473\HW1>
```

2 Problem 2

$$\begin{aligned} \text{delay} &= (56\text{bytes} \times (8\text{bits}/\text{byte})) / 64\text{kbps} + 10\text{msec} + (56\text{bytes} \times (8\text{bits}/\text{byte})) / 2\text{Mbps} \\ &= 7\text{msec} + 10\text{msec} + 0.224\text{msec} = 17.224 \end{aligned}$$