

Part 1:

Task 1.1:

TCP Server:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuTh  
anhNhan - ITITIU21267 - Lab3\Part1> go run tcp_  
server.go  
Chat server listening on :9000  
Alice joined the chat  
Bob joined the chat  
Broadcasting from Alice: Hello everyone!  
Broadcasting from Bob: Hi Alice!  
Alice left the chat  
[]
```

TCP Client 1 (Alice):

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuTh  
anhNhan - ITITIU21267 - Lab3\Part1> go run tcp_  
client.go  
Enter username: Alice  
*** Alice joined the chat ***  
Hello everyone!  
[Bob]: Hi Alice!  
exit  
Leaving chat...
```

TCP Client 1 (Bob):

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuTh  
anhNhan - ITITIU21267 - Lab3\Part1> go run tcp_  
client.go  
Enter username: Bob  
*** Bob joined the chat ***  
[Alice]: Hello everyone!  
Hi Alice!
```

Task 1.2:

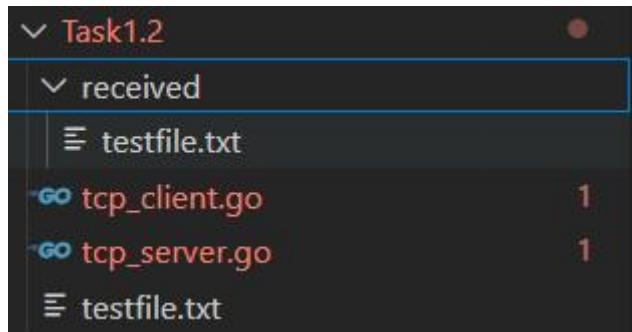
TCP Server:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuThanhNhan - ITITIU21267 -  
Lab3\Part1\Task1.2> go run .\tcp_server.go  
File Transfer Server listening on :8081  
Client connected  
Receiving file: testfile.txt (94 bytes)  
File saved successfully to received\testfile.txt (94 bytes written)
```

TCP Client:

```
Lab3\Part1\Task1.2> echo "Hello, this is a test file for TCP transfer!"> testfile.txt  
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuThanhNhan - ITITIU21267 -  
Lab3\Part1\Task1.2> go run .\tcp_client.go testfile.txt  
Sending file: testfile.txt  
Connected to server  
Sent: 94/94 bytes (100.00%)  
✓ File transfer complete!  
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuThanhNhan - ITITIU21267 -
```

Receive file data and save it to ./received/:



Part 2:

Task 2.1:

UDP Ping Server:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuThanhNhan - ITITIU21267 -  
Lab3\Part2\Task2.1> go run .\udp_ping_server.go  
== UDP Ping Servers ==  
Ping server [Server-3] started on port 9003  
Ping server [Server-1] started on port 9001  
Ping server [Server-2] started on port 9002
```

UDP Ping Client:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuThanhNhan - ITITIU21267 -  
Lab3\Part2\Task2.1> go run .\udp_ping_client.go  
== UDP Ping Monitor ==
```

Pinging servers...

Server	Status	RTT
<hr/>		
localhost:9001	✓ Online	0.5ms
localhost:9003	✓ Online	0.5ms
localhost:9002	✓ Online	0.5ms

Average RTT: 0.5ms

Success Rate: 100.00% (3/3)

Pinging servers...

Task 2.2:

UDP Discovery Server:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuThanhNhan - ITITIU21267 -  
Lab3\Part2\Task2.2> go run .\udp_discovery_server.go  
== UDP Discovery Server ==  
Discovery server listening on port 8083  
Responded to discovery from 192.168.1.5:56960 for service 'Database Service'  
Responded to discovery from 192.168.1.5:56960 for service 'Web Service'  
Responded to discovery from 192.168.1.5:56960 for service 'API Service'
```

UDP Service Discovery Client:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuThanhNhan - ITITIU21267 -  
Lab3\Part2\Task2.2> go run .\udp_discovery_client.go  
== UDP Service Discovery Client ==  
Discovering services...  
Found 3 services:  
Service Name          Address      Port  
-----  
Database Service     192.168.1.5    5432  
Web Service          192.168.1.5    8080  
API Service          192.168.1.5    3000  
  
Discovery complete!
```

Part 4:

Server:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuT  
hanhNhan - ITITIU21267 - Lab3\Part4> go run hybrid_chat_server.go  
== Hybrid Chat Server ==  
UDP Server listening on :9001  
TCP Server listening on :9000  
Alice connected via TCP  
[UDP] Alice: online  
[UDP] Alice: typing  
[TCP] Alice: Hi all  
[UDP] Alice: online  
[UDP] Alice: online  
[UDP] Alice: online  
Bob connected via TCP  
[UDP] Bob: online
```

Client Alice:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuT  
hanhNhan - ITITIU21267 - Lab3\Part4> go run .\hybrid_chat_client.go  
)  
Enter username: Alice  
*** Joined chat room ***  
> Hi all  
[23:20:42] Alice: Hi all  
>  
Status Update: Bob is online  
>  
Status Update: Bob is online  
>  
Status Update: Bob is typing  
> [23:20:58] Bob: Hi  
>  
Status Update: Bob is online
```

Client Bob:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuT  
hanhNhan - ITITIU21267 - Lab3\Part4> go run .\  
hybrid_chat_client.go  
Connected to chat server (TCP: 9000, UDP: 9001  
)  
Enter username: Bob  
*** Joined chat room ***  
[23:20:42] Alice: Hi all  
> >  
Status Update: Alice is online  
> Hi  
[23:20:58] Bob: Hi  
>  
Status Update: Alice is online  
>
```