

Part 1:

Task 1.1:

TCP Server:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuTh  
anhNhan - ITITI21267 - 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 - ITITI21267 - 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 - ITITI21267 - 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 - ITITI21267 -  
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 - ITITI21267 -  
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 - ITITI21267 -
```

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



Part 2:

Task 2.1:

UDP Ping Server:

```
PS C:\Users\VUTHANHHUNG\Desktop\Netcen Pro\VuThanhNhan - ITITI21267 -  
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 - ITITI21267 -  
Lab3\Part2\Task2.1> go run .\udp_ping_client.go  
=== UDP Ping Monitor ===  
  
Pinging servers...  


| Server         | Status   | RTT   |
|----------------|----------|-------|
| 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 - ITITI21267 - Lab3\Part4> go run hy
brid_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 - ITITI21267 - 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
>
```