Here's a **clear explanation of all the slides** you shared, **in the exact order** you sent them, split into understandable parts:

☑ Basic UDP Client Code (Slide 46)

📄 Code Overview – `UDPClient.java`

```
import java.io.*;
import java.net.*;

public class UDPClient {
    public static void main(String args[]) throws Exception {
        BufferedReader inFromUser = new BufferedReader(new
InputStreamReader(System.in));
        DatagramSocket clientSocket = new DatagramSocket(); // Create UDP
socket

        InetAddress IPAddress = InetAddress.getByName("localhost"); // Server
IP

        byte[] sendData = new byte[1024];
        byte[] receiveData = new byte[1024];

        String sentence = inFromUser.readLine(); // Read input from user
        sendData = sentence.getBytes(); // Convert to bytes

        DatagramPacket sendPacket = new DatagramPacket(sendData,
sendData.length, IPAddress, 9876);
        clientSocket.send(sendPacket); // Send to server

        DatagramPacket receivePacket = new DatagramPacket(receiveData,
receiveData.length);
        clientSocket.receive(receivePacket); // Wait for response

        String modifiedSentence = new String(receivePacket.getData());
        System.out.println("FROM SERVER:" + modifiedSentence);

        clientSocket.close(); // Close connection
    }
}
```

☑ Summary:

- The client reads input from the user.
- Sends a datagram to the server at `localhost:9876`.
- Waits for the server's reply.
- Prints the server's response and exits.

☑ Basic UDP Server Code (Also Slide 46)

📄 Code Overview – `UDPServer.java`

```
import java.io.*;
import java.net.*;

class UDPServer {
    public static void main(String args[]) throws Exception {
        DatagramSocket serverSocket = new DatagramSocket(9876); // Listen on
port 9876
        byte[] receiveData = new byte[1024];
        byte[] sendData  = new byte[1024];

        while(true) {
            DatagramPacket receivePacket = new DatagramPacket(receiveData,
receiveData.length);
            serverSocket.receive(receivePacket); // Receive client request

            String sentence = new String(receivePacket.getData());
            InetAddress IPAddress = receivePacket.getAddress();
            int port = receivePacket.getPort();

            String capitalizedSentence = sentence.toUpperCase(); // Process
message
            sendData = capitalizedSentence.getBytes();

            DatagramPacket sendPacket = new DatagramPacket(sendData,
sendData.length, IPAddress, port);
            serverSocket.send(sendPacket); // Reply to client
        }
    }
}
```

☑ Summary:

- Server listens on port 9876.
- Converts incoming message to uppercase.
- Sends it back to the client.
- Runs indefinitely.

☑ Quote Server & Client Overview (Slide 47)

This is a more **structured example** of UDP communication.

- **Server:** Listens for client requests.
    - Each request means: “Send me a quote.”

    - Server reads a quote from a file (`one-liners.txt`) and sends it back.
- **Client:** Sends one request and receives one quote.
- Two server classes: `QuoteServer` and `QuoteServerThread`
- One client class: `QuoteClient`

☑ QuoteServer.java (Slide 47)

📄 Code:

```
import java.io.*;

public class QuoteServer {
    public static void main(String[] args) throws IOException {
        new QuoteServerThread().start();
    }
}
```

- It just starts the `QuoteServerThread`, which contains the real logic.
- Runs the quote server on a separate thread.

☑ QuoteServerThread.java – Constructor (Slide 48)

📄 Constructor:

```
public QuoteServerThread() throws IOException {
    this("QuoteServer");
}

public QuoteServerThread(String name) throws IOException {
    super(name);
    socket = new DatagramSocket(4445); // Server listens on port 4445

    try {
        in = new BufferedReader(new FileReader("one-liners.txt"));
    } catch (FileNotFoundException e) {
        System.err.println("Couldn't open quote file. Serving time
instead.");
    }
}
```

- Server socket listens on **port 4445**
- Tries to open a file containing quotes (`one-liners.txt`)
- If the file is not found, it will instead return the current system time

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☑ QuoteServerThread.java – run() Method (Slide 49)

📄 Logic:

```
byte[] buf = new byte[256];
DatagramPacket packet = new DatagramPacket(buf, buf.length);
socket.receive(packet); // Wait for a request
```

- Receives a packet from a client.

```
String dString = null;
if (in == null)
    dString = new Date().toString(); // Use date if file is missing
else
    dString = getNextQuote(); // Read quote from file
```

- Gets a quote or the current date.

```
buf = dString.getBytes();
InetAddress address = packet.getAddress();
int port = packet.getPort();
packet = new DatagramPacket(buf, buf.length, address, port);
socket.send(packet); // Send the quote to the client
```

- Sends the response to the same address and port of the requesting client.

☑ QuoteClient.java (Slide 51)

📄 Key variables in the main method:

```
int port;
InetAddress address;
DatagramSocket socket = null;
DatagramPacket packet;
byte[] sendBuf = new byte[256];
```

- These are used to manage the sending/receiving of datagram packets.

📄 Command-line check:

```
if (args.length != 1) {
    System.out.println("Usage: java QuoteClient <hostname>");
    return;
}
```

- The client **requires one argument**, the hostname of the server (e.g., `localhost` or IP).

☑ How the QuoteClient Works (implied):

- Sends a request to the server.
- Waits for a quote to be returned.
- Prints the quote.

📌 Summary of Key Concepts

Concept	Explanation
UDP	Connectionless protocol for fast, lightweight communication.
`DatagramSocket`	Used to send/receive UDP packets.
`DatagramPacket`	Contains data, address, and port for sending/receiving.
Client Workflow	Create socket → send packet → wait for reply → close.
Server Workflow	Create socket → wait for packets in loop → process and reply.
QuoteServer	Responds with a quote (or date) for each client request.

Let me know if you'd like me to:

- Provide diagrams
- Add full `QuoteClient.java` code
- Or explain `getNextQuote()` method implementation.