HANDSHAKE COMMUNICATION BETWEEN MASTER AND CLIENT

1. PROJECT PURPOSE:

The purpose of this project is to exchange data from master to slave over serial communication (Ex: uart,spi).

2. FUNCTIONALITIES OF THE SYSTEM:

These functionalities have been implemented in the program:

- ➔ Data exchanging between master to slave over serial communication.
- ➔ Support for asynchronous and synchronous communication modes.
- ➔ Error detection and recovery mechanisms.
- ➔ Data integrity verification through checksums or other Techniques.

Compiling the code:

- ➔ On slave's Terminal create an user space application that should invoke the respective driver.
- ➔ To run the code, First on the slave's Terminal: ./a.out driver_name.
- ➔ Compile the Driver and insert the module ex: sudo insmod driver_name.
- ➔ Enter the choice either to send the data or receive etc.
- ➔ Closing The Communication remove the module ex: sudo rmmod driver_name.

3. OPERATING ENVIRONMENT:

Operating environment for Transferring data from master and client using Serial communication are:

- Mater and Client system
- Operating system: Linux
- Platform: Ubuntu/C

4. TESTING PLAN:

- **Test Strategy:** Develop unit tests, integration tests and systems tests for validating the data receiving across the serial communication.
- **Unit Tests:** Test individual handler functionality (Ex: **Spi,Uart**).
- **Integration Tests:** Test master-slave communication and data transfer, ensuring synchronization, error handling and throughput.
- **System Testing :** Test data transfer across the full system (master to client) under various conditions (Ex: different baudrates , data sizes).

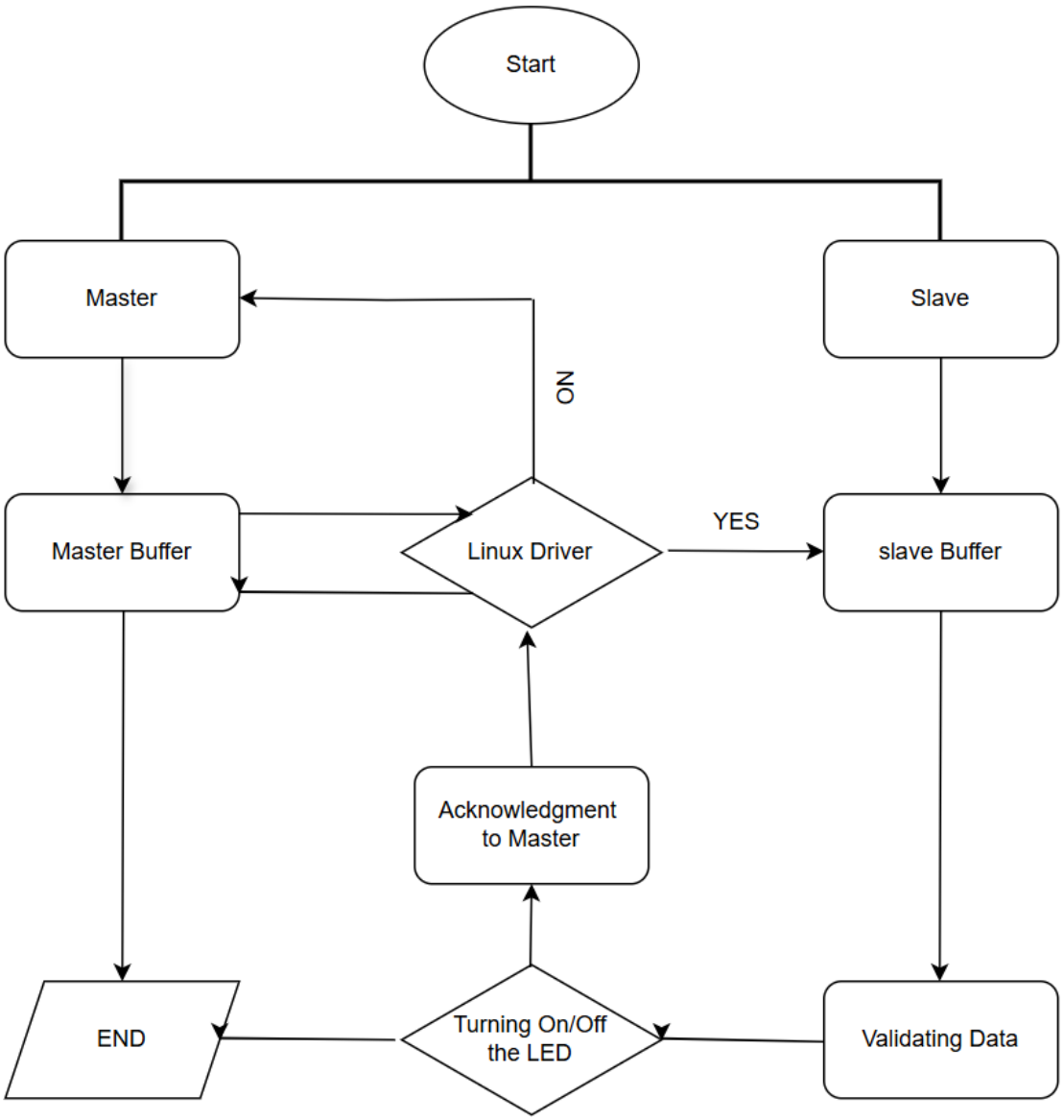
- **Test cases:**

  1. verify successful data receive from master to client.

  2. simulate errors (Ex: buffer overflows ,lost data) and test error handling.

  3. performance testing under different loads.

5.FLOW DIAGRAM



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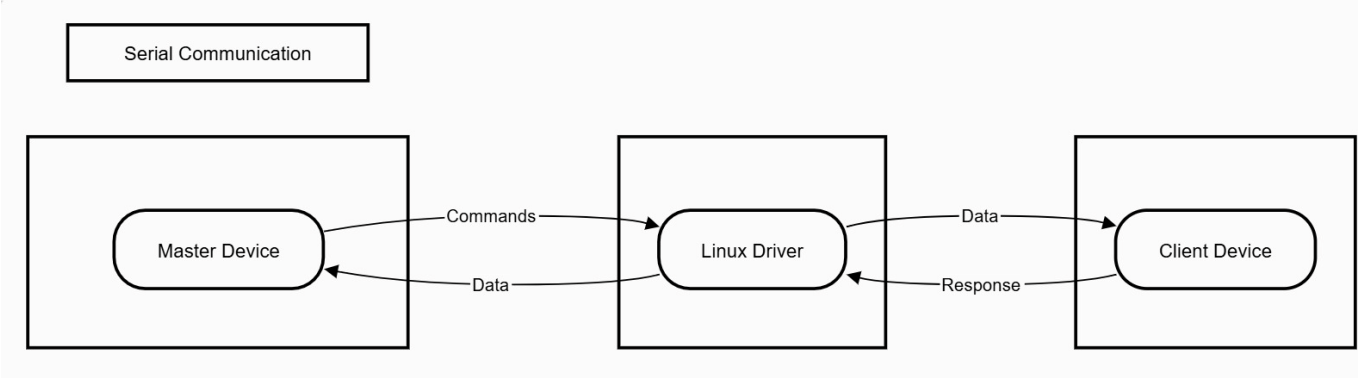

Serial Comm Linux Device Drive b/w master and client .

6.BLOCK DIAGRAM

1. **Master Device:**
   The master device initiates communication by sending the commands. These commands are instructions or request meant to interact with the client device.

2. **Driver Receives commands:**
   The commands from the master device are passed to the Linux driver. The driver acts as an intermediary layer that processes and translates these commands for the client device.
3. **Driver Sends to Client:**
   After processing the commands the Linux driver sends the appropriate data or instruction to the client device via serial communication channel.

4. **Client Device Processes:**
   The Client device receives and interprets the commands from the Linux driver based on the commands, the client device performs specific actions or computations.

5. **Client Sends Response:**
   Once the client device completes the required action. It generates a response this could be a status message, output data or any other result of the operation.

6. **Driver Receives Response:**
   The Linux Driver collects the response from the client device and prepares it for transmission back to the master device.

7. **Master Responds to Driver:**
   The response is send back to the master device through the Linux driver this completes the communication cycle.

5. CONCLUSION:

The project successfully developed and tested a Linux device driver capable of facilitating communication between a master and client over serial communication (Ex: spi,uart)The driver ensures reliable data transfer, robust error handling and correct protocol compliance through rigorous testing and modular design.