**Dynamic Design**

CPU Load = 20 %

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task No** | **Task name** | **Periodicity** | **Delay** | **Priority** | **Execution Time** |
| **T1** | **LCD\_TASK** | **2ms** | **0** | **0** | **20us** |
| **T2** | **KPD\_Task** | **150ms** | **0** | **1** | **50us** |
| **T3** | **KEYPAD\_Update** | **5ms** | **0** | **2** | **100us** |
| **T4** | **Display\_task** | **1000ms** | **0** | **3** | **20us** |

**UART Frame Structure**

**Start Byte:** A fixed value (0xFF) marks the beginning of a frame.

**Data Byte:** A single byte containing the payload information (likely the key value in this case).

**Checksum Byte:** A basic calculated checksum to help detect transmission errors.

**End Byte:** Another fixed value (0xFF) signals the end of the frame.

**Why Use a Frame?**

UART communication at its core is asynchronous and serial. This means:

**No Clock Signal:** There's no shared clock between the transmitter and receiver.

**Byte at a Time:** Data is sent one byte after another.

Framing provides structure to this stream of bytes:

**Synchronization:** Start and end bytes help the receiver know where a valid transmission unit begins and ends.

**Basic Error Detection:** The checksum offers a simple way to check for potential corruption during transmission.

**Milestones**

|  |  |
| --- | --- |
| **Team A** | **Team B** |
| **Heba Elsayed Fouad** | **Mohamed Abdelkader** |
| **Mohamed Ahmed Fouad** | **Omer Ahmed Ali** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Implementation** | | | |
| *Team A* | | *Team B* | |
| **Component** | **Owner** | **Component** | **Owner** |
| *MCAL Modules* | | | |
| *RCC Driver* | Heba | *RCC Driver* | Mohamed Abdelkader |
| *GPIO Driver* | Heba | *GPIO Driver* | Mohamed Abdelkader |
| *SysTick Driver* | Mohamed Ahmed Fouad | *SysTick Driver* | Mohamed Abdelkader |
| *NVIC Driver* | Heba | *NVIC Driver* | Omar |
| *RTC* | Heba | *RTC* | Omar |
| *USART Driver* | Heba | *USART Driver* | Mohamed Abdelkader |
| *HAL Modules* | | | |
| *Keypad Driver* | Mohamed Ahmed Fouad | *Keypad Driver* | Omar |
| *LCD Driver* | Mohamed Ahmed Fouad | *LCD Driver* | Mohamed Abdelkader |
| *Service Modules* | | | |
| *Scheduler* | Mohamed Ahmed Fouad | *Scheduler* | Omar |
| *APP Modules* | | | |
| *Data Collect* | Mohamed Ahmed Fouad | *Data Collect* | Mohamed Abdelkader |
| *PROCESSING.* | Heba | *PROCESSING.* | Omar |
| *ACTION* | Mohamed Ahmed Fouad | *ACTION* | Omar |
| **Component Testing** | | | |
| **MCU1** | Both Team Members | **MCU2** | Both Team Members |
| **Integration Testing** | | | |
| **MCU1** | Both Team Members | **MCU2** | Both Team Members |
| **System Testing** | | | |
| **The System is working to the requirements** | | **MCU1**  **MCU2** | All Team Members |