

The Project Ideas of Embedded System Course

- This is a team-based project, so **each student must join a team.**
- Each team should consist of **4 to 6 members at maximum.**
- The deadline for registration is **Tuesday 9-5-2-2023 at 11:59 pm**
- The project discussion: **Saturday 27-5-2023**
- Anyone who registers after the deadline → **MINUS 3**
- Anyone does not adhere to his idea or choose his idea by himself without referring to us → **MINUS 5**

| Project Name | Description |
|--------------|--|
| Alarm clock | <ul style="list-style-type: none">• General Idea: Have an alarm that displays the current time and the alarm time in the format HH: MM: SS PM/AM, and when the alarm time comes, the buzzer and the red Led are turned on until the user turns them off.• The current time is displayed on the LCD and the user can control it through the keypad.• When the clock starts, the user should adjust the time in HH: MM: SS PM/AM format.• After that, the clock should work typically: when the seconds reach 59, the seconds should reset to 0, and the minutes should increment by 1. When the minutes reach 59, the minutes should reset to 0, the hour increment by 1, and so on.• There should be three specific buttons—the first one to be able to adjust the time at any time.• The second button is to be able to enter the alarm time mode. In this mode, the user can enter the alarm time. When the user presses this button again after entering the alarm time, the clock will return to the normal mode, which is the time mode.• The third button is to turn off the buzzer and the red LED when the alarm time comes.• Note: You must implement any needed driver for the used H/W component. It is not allowed to write all the code in the main. |

The Project Ideas of Embedded System Course

| | |
|----------------------------|---|
| Sorting Algorithm | <ul style="list-style-type: none">• General Idea: have an algorithm for sorting numbers in ascending order.• The user will enter the numbers through the keypad, which will be displayed on the LCD.• And after pressing the confirmation button (the end of entering numbers), they should be displayed in order on the LCD and then on the 4 seven segments.• Ex: if the user enters: 4, 1889, 177,23• It should be displayed as 4, 23, 177, 1889 on the LCD.• After that, we should first see number 4 in the seven segment. After 1 sec, we should see 23 in the seven segments. After another 1 sec, we should see 177 on the seven segments and so on.• The numbers can consist of 4 digits maximum.• Note: You must implement any needed driver for the used H/W component. It is not allowed to write all the code in the main. |
| Searching Algorithm | <ul style="list-style-type: none">• General Idea: have an algorithm for searching for a specific number and returning its position/s.• The user will enter a list of numbers through the keypad, which will be displayed on the LCD.• After pressing the confirmation button (the end of entering numbers), the user will enter the number he wants to search for.• After pressing the confirmation button, the position will be displayed on the seven segment. Also, the binary representation of the position should be displayed on the LEDs.• Ex: if the user enters: 1, 1, 2,1 and he wants to search on 1• We should first see 0 in the seven segment and 0000 on the LEDs. After 1 sec, we should see 1 in the seven segments and 0001 on the LEDs. After another 1 sec, we should see 3 on the seven segment and 0011 on the LEDs where 0,1, and 3 are the positions of 1.• In the binary representations of the LEDs, 0 means the LED is off and 1 means the LED is on.• If the number is repeated, all positions must be printed.• The maximum length of the list is 16.• Note: You must implement any needed driver for the used H/W component. It is not allowed to write all the code in the main. |