

## SYSTEM\_REQUIREMENTS

*	Write the LCD driver [ LCD.c , LCD.h , LCD_CFG.h ] The driver must be able to operate the LCD in both modes [ 4-bit mode , 8-bit mode ] Let me choose the mode of operation in LCD_CFG.h file The LCD.c file must contain the following functions :
1	<u>void LCD_INIT()</u> To initialize the LCD as output component Send commands to LCD to choose mode of operation [ 4-bit or 8-bit ]
2	<u>void LCD_WRITE_CMD( u8 command)</u> Use this function to send command to LCD
3	<u>void LCD_WRITE_CHR( u8 character)</u> Use this function to display character on LCD
4	<u>void LCD_WRITE_STRING( u8*p )</u> Use this function to display string on LCD
5	<u>void LCD_WRITE_NUM( u32 number )</u> Use this function to display numbers on LCD
6	<u>void LCD_CLEAR()</u> Use this function to clear the LCD screen
7	<u>void LCD_STOP_GO_TO( u8 row , u8 col )</u> Use this function to display in a specific row and column in the LCD
8	<u>void LCD_STOP_WATCH_DISPLAY( u8 second , u8 minut , u8 hour )</u> Use this function to display the time in this form ( hh:mm:ss )

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*	Write the BUZZER driver [ BUZZER.c , BUZZER.h , BUZZER_CFG.h ] The BUZZER.c file must contain the following functions :
1	<u>void BUZZER_INIT( void )</u> To initialize the buzzer as output component
2	<u>void BUZZER_ON( void )</u> Turning on buzzer
3	<u>void BUZZER_OFF( void )</u> Turning off buzzer
4	<u>void BUZZER_ONCE( void )</u> Generate short beep sound for one time
5	<u>void BUZZER_TWICE( void )</u> Generate short beep sound two times
6	<u>void BUZZER_TRIPLE( void )</u> Generate short beep sound three times
7	<u>void BUZZER_LONG( void )</u> Generate long beep sound for one time



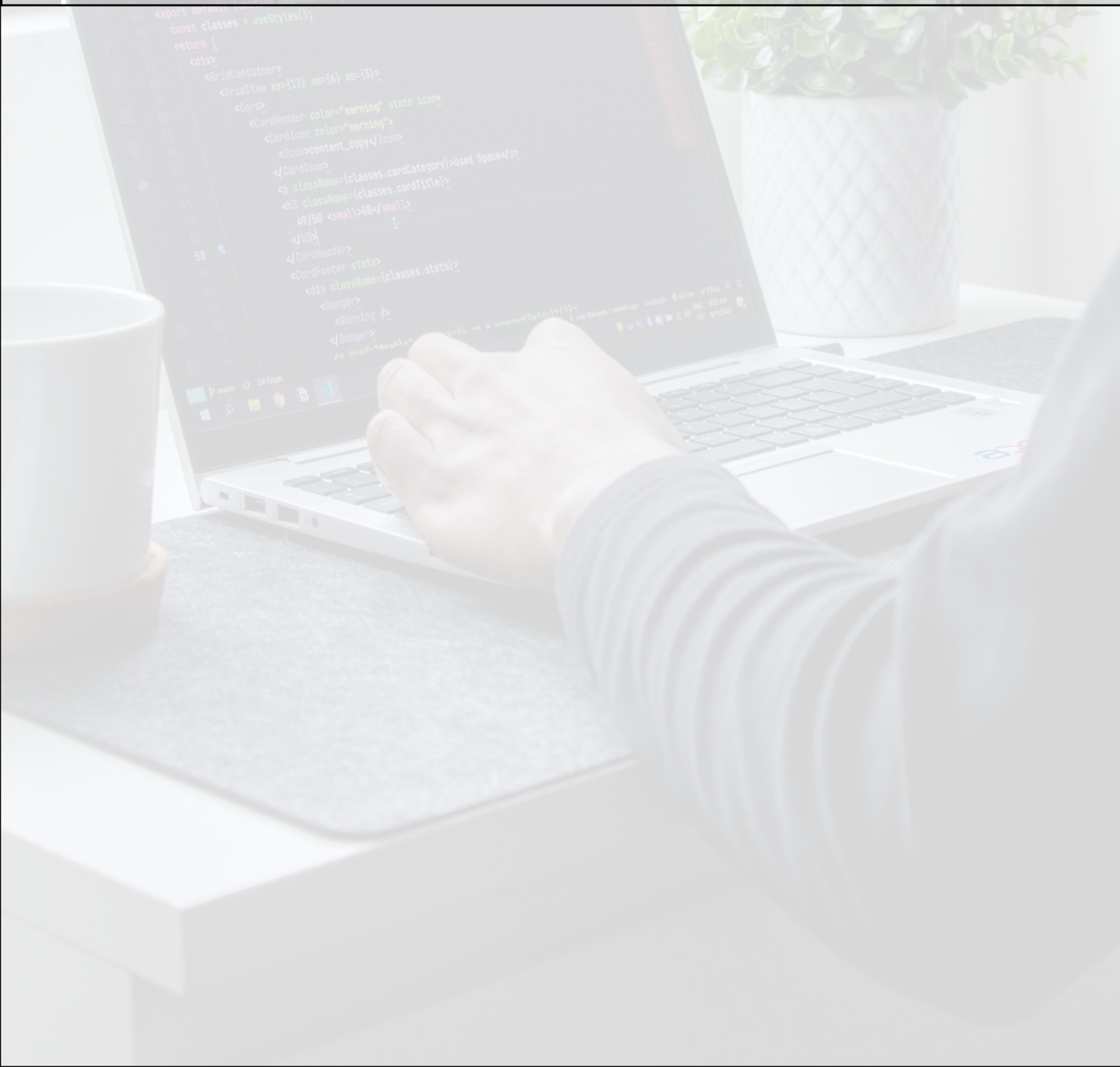
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*	Write the TIMER_0 driver [ TIMER_0.c , TIMER_0.h , TIMER_0_CFG.h ] The TIMER.c file must contain the following functions :
1	<code>void TIMER_0_INIT( void )</code> To initialize the TIMER_0
2	<code>void TIMER_0_SET_TIME( u32 desired_time )</code> Send your desired time to this function -> 1 second
3	<code>void TIMER_0_START( void )</code> To start TIMER_0
4	<code>void TIMER_0_STOP( void )</code> To stop TIMER_0
5	<code>ISR(TIMER_0_vect)</code> Use this function to increase seconds and if seconds = 60, clear it and increase minutes by 1 and if minutes reach 60 clear it and increase hours by 1



## SYSTEM\_REQUIREMENTS

*	Write the PUSH_BUTTON driver [ P_B.c , P_B.h , P_B_CFG.h ] The P_B.c file must contain the following functions :
1	<u>void PUSH_BUTTON_INIT( u8 button )</u>
	Make all push button pins are inputs
	Enable the pull up resistors for all push button pins
	Make PB7 pin as output Make PB7 low
2	<u>u8 PUSH_BUTTON_READ( u8 button )</u>
	Use this function to select a specific push button to read and return 0 if pressed
*	NOTE_1 : solve bouncing problem NOTE_2 : take the action if released push button





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*	Create two files in application layer : [ APP.c , APP.h ] These two files must contain the following functions :
1	<u>void ASKING( void )</u>  Check the 4 push buttons, if any push button pressed, set a specific flag and pass the question number to <u>CHECK_ANSWER()</u>
2	<u>void CHECK_ANSWER( u8 question )</u>  Receive the question number and switch on it from case 1 to case 30 In each case switch on the flag of the right answer from the questions If set call <u>RIGHT_ANSWER()</u> If clear call <u>WRONG_ANSWER()</u>
3	<u>void RIGHT_ANSWER( void )</u>  Call <u>BUZZER_ONCE()</u> Display in LCD " GREAT " increase question by 1 ( flag represent the current question number )
4	<u>void WRONG_ANSWER( void )</u>  Call <u>BUZZER_ONCE()</u> Display in LCD " 1 MINUTE PENALTY " Display in LCD " LOSER " Increase minutes by 1