Homework #3 – Ext. Interrupts

LCDs and keypads can provide a convenient way of interaction with embedded systems to the end user. In this experiment you will be introduced to these components and also get your hands on external interrupts.

The experiment's objective is to design a basic security system with following description. The implemented system consists of an Arduino, 16x2 alphanumeric display, 4x3 keypad and a push button. A default password is hard coded in the Arduino code and users can enter a password using the keypad. Every time they press a button a star symbol is displayed on the LCD. When they entered the desired password, they can submit the password by pressing '*' on the keypad. They can also edit the entered password by pressing '#' which deletes the last character on each press.

But what if the users want to check if they entered the correct password before submitting? This is where the push button comes in. The button acts as a toggle switch for showing the password. If the entered password is invisible and a user presses the button the LCD should be cleared, and the entered password must be printed on it. When the password is visible and user presses the button, LCD should be cleared, and a star symbol should be printed for each entered number. Please note that if show password is active, newly entered characters should also be displayed. The show password mechanism should be implemented with the help of external interrupts. The interrupt should be sensitive to the **rising edge** of the button's signal.

After submitting the password two scenarios happen: the password is either correct or wrong. If the password is correct "Access is granted" should be displayed on the LCD and if it's wrong, "Wrong password" should be displayed. In either case the message should disappear after one second and the system should receive new input again.

Components used in proteus:

SIMULINO UNO, LM016L, BUTTON, KEYPAD-PHONE, 10K pulldown resistor

Good Luck

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