

Lab 5

- Interfacing EEPROM via MSSP
 - SPI and I2C interfaces
- Most of us are done with lab 4
- This is the last week for full credit on labs 2 and 3
- Get a new partner
- If you were done with lab 4 at the beginning of class last Thursday you are to use the DEM2 board with your new partner (I2C interface)
- We've already reviewed EEPROMs, I2C, and SPI

Lab 5

- Stuff we've already done
- Write to the LCD
- Read value from potentiometer via A/D
- Read from push buttons
- I would recommend using polling for
 - Reading from pot
 - Reading from buttons

Lab 5

- General program flow
 - Initialize LCD
 - Setup buttons and pot
 - Setup EEPROM
 - Port directions & MSSP setup
 - Infinite loop
 - Read pot value
 - Check buttons
 - Read/write to EEPROM
 - Update LCD based

Lab 5

- I have the following functions
 - void writeAddressToLCDInHex(unsigned int value, unsigned char digits, unsigned char with0x);
 - void writeAddressToLCDInDec(unsigned int value, unsigned char digits, unsigned char withComma);
 - void writeAddressToLCDInBin(unsigned int value, unsigned char digits, unsigned char with0b);
 - void initializeEEPROM(void);
 - unsigned char readByteEEPROM(unsigned int address);
 - void writeByteEEPROM(unsigned int address, unsigned char value);
 - void errorEEPROM(unsigned char);

Lab 5

- Information sources
 - SPI EEPROM
 - The EEPROM datasheet has the instructions
 - Read, write, write enable
 - The board user manual has the wiring
 - SDI, SDO, CS, SCK
 - I2C EEPROM
 - The EEPROM datasheet has lots of good information
 - Control code 1010
 - Chip select bits 000
 - The board user manual has the wiring
 - SDA and SCK

Lab 5

- SPI Read
 - Clear CS
 - Clear SSPIF
 - Assign instruction to SSPBUF
 - Poll SSPIF
 - Clear SSPIF
 - Assign address MSB to SSPBUF
 - Poll SSPIF
 - Clear SSPIF
 - Assign address LSB to SSPBUF
 - Poll SSPIF
 - Clear SSPIF
 - Clear SSPBUF
 - Poll SSPIF
 - Poll SSP buffer full (BF)
 - Clear SSPIF
 - Copy value from SSPBUF (result of read)
 - Set CS

Lab 5

- I2C Read
 - Clear SSPIF
 - Set SEN (start condition)
 - Poll SSPIF
 - Check ACKSTAT
 - Clear SSPIF
 - Assign write command to SSPBUF (to set the address)
 - Poll SSPIF
 - Check ACKSTAT
 - Clear SSPIF
 - Assign address MSB to SSPBUF
 - Poll SSPIF
 - Check ACKSTAT
 - Clear SSPIF
 - Assign address LSB to SSPBUF
 - Poll SSPIF
 - Check ACKSTAT

Lab 5

- I2C Read (cont)
 - Clear SSPIF
 - Set RSEN (start condition - cancel write, switch to read)
 - Poll SSPIF
 - Don't check ACKSTAT
 - Clear SSPIF
 - Assign read command to SSPBUF
 - Poll SSPIF
 - Check ACKSTAT
 - Clear SSPIF
 - Set RCEN (receive condition)
 - Poll SSPIF
 - Check ACKSTAT
 - Clear SSPIF
 - Copy value from SSPBUF (result of read)
 - Set PEN (stop condition)
 - Poll SSPIF
 - Check ACKSTAT

Lab 5

- Tonight
 - Get the basic functionality working
 - Reading potentiometer
 - Reading buttons
 - Output to LCD
 - Put stubs in for reading/writing to EEPROM
 - Have Read return 0 (or some other value)
 - Have write simply return
 - Toggling between modes
 - Start working on reading from the EEPROM
- We are shooting to have the lab done Thursday
 - Once we have reading working, writing should be pretty easy