EECE416 :Microcomputer Fundamentals and Design

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Microcontroller Application

www.MWFTR.com

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Arduino

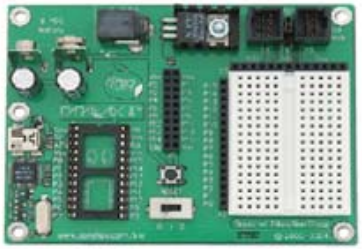
UNO

MINI

Mini USB Arduino Nano V3.0
ATMEGA328P Module CH340G 5V16M
Micro-controller board

Basic Stamp 2

USB



Serial

Texas
Instruments
MSP430
LaunchPad

STM32F

How we learn and use them

- Parallel Learning
  - Class moves on with i386 Assembly
  - uP Project goes on in parallel
  - Team-learning
- Team Learning Process
  - **3**-Week Cycles for a type of uP
  - Take turns to another type of uP (if everything works fine and as scheduled)
- **3** -Week Cycle Schedule
  - Starting Day is Thursday
  - Ending Day is Tuesday
  - 1 Week period is **R**-F-S-D-M-**T**-W

- This means: **Every Tuesday** there must be something to deliver – **presentation, demo, etc**

1st Round (Oct)& 2nd Round (Nov)

Group	Controller / Oct	Controller / Nov
8	Stamp2A	STM32F
6	Stamp2B	Arduino Mini
2	Arduino Uno	MSP430
4	Arduino Uno	Arduino Mini
1	STM32F	Stamp2A
5	Arduino Mini	Stamp2B
7	MSP430	Arduino Uno
3	MSP430	Arduino Uno
9	Arduino Uno	MSP430

1st Round 3-Week Cycle

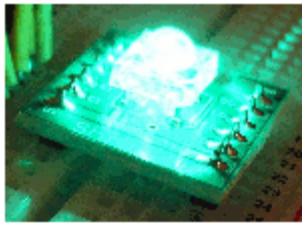
- Week 1: Delivery Date is Oct 11 (T)
  - Find out what items are needed to work with the controller
  - Search and learn about programming environment
  - Know the pins, connectors, cables of the controller
  - Run a sample code
  - **Make and submit a written or video report on the activities (Week 1 deliverables)**
- Week 2:Delivery Date is Oct 18 (T)
  - Write a code for a component and task given
  - Make and submit a written or video report on the activities
- Week 3:Delivery Date is Oct 25 (T)
  - Write a code for a component and task given
  - Make and submit a written or video report on the activities

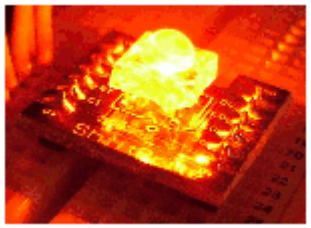
1st Round - Week1 Issues

- Week 1 (due Oct 11)
  - ISSUES – Driver Program and/or OS incompatibility
    - Mini Arduino
    - MSP430
  - SOLUTION1
    - Try to solve by Wednesday
    - If not solved, receive new type of controllers ASAP
  - SOLUTION2
    - Suggestion???

1st Round – Week2

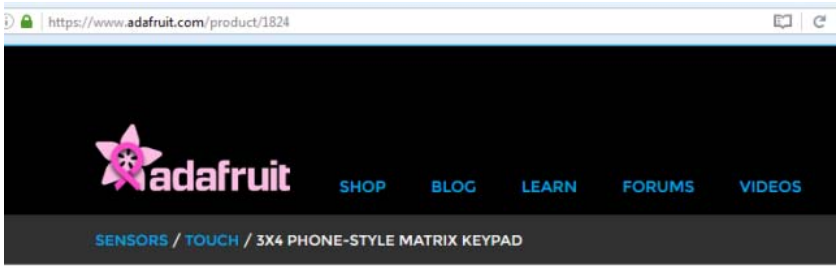
- Week 2 (due Oct 18)
  - Connection of an RGB LED
  - **Written Report (electronic submission)**– must include
    - Brief description of the project
    - Code
    - Connection Diagram
    - Screen captures or photo-shots of working system





1st Round--- 3rd Week

- Add a **keypad** or a **distance sensor** to control/change the color of the RGB LED
- **3x4 Keypad (4)**



1st Round--- 3rd Week

- a distance sensor: HC-SR04 (3)

Microcontroller Project --- 3rd Week

- a distance sensor –Parallax Ping Ultrasound Sensor (2)

1st Round --- 3rd Week

Note2

* Note3

* Microcontroller Project

------- If your board is a mini Arduino USB from China ("Arduino Nano CH340"): (1) Download and Save this driver file, (2) Read this driver installation instruction, and once all done, (3) See this figure to properly select this mini Arduino.

------- First component to connect: ShiftBrite V2.0 RGB LED from Macetech. Link to the Datasheet and Documents. Try to turn on (in different colors) and off.

------- Now connect either a 3x4 keypad or a range finder (Parallax Ping or HC-SRQ4) by which the color of the above RGB LED may controlled.

1st Round --- 3rd Week

- Example Color Control
  - Green (Far) (0 – 3)
  - Yellow (Middle) (4 --6)
  - Red (Close) (7 – 9)



- ***FINAL REPORT***: **WRITTEN** REPORT by T Nov 1
  - Softcopy (File) – Description, Code, Display, Photos, etc

Demo

- Round 1 --- Demonstration from Volunteering groups
  - Group 1
  - Group 4
  - Group 6

2nd round of microcontroller project

- **Exchange** Device (Controller, USB Cable, Keypad/Distance Sensor)
- **Keep** ShiftBrite RGB LED and wires.

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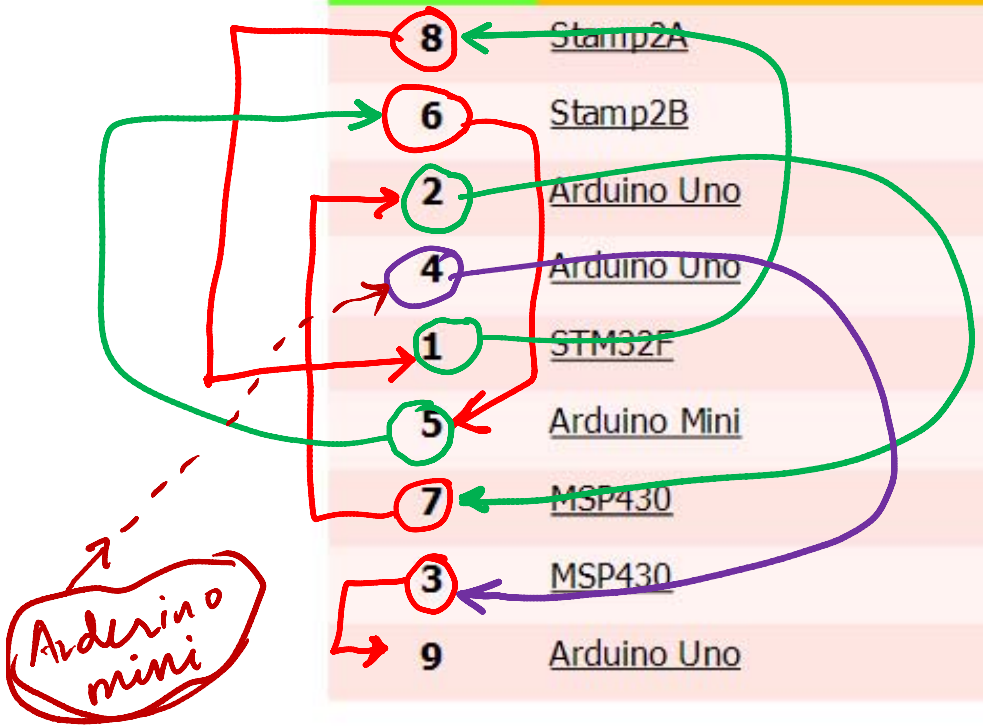

2nd round of microcontroller project

- Week 1 Assignment
  - RGB LED connection
  - Video Clip submission for the completed work (**Nov 8)**

- Week 2: Delivery Date is **Nov 15 (T)**
  - Connect RGB LED and Distance Sensor (or Keypad)
  - Video Clips Submission of the Completed Work (Nov 15)

- Week 3: Delivery Date is **Nov 22 (T)**
  - Connect additional component (TBD) + RGB LED + Sensor (or Keypad)
  - Written Report
  - Demonstration