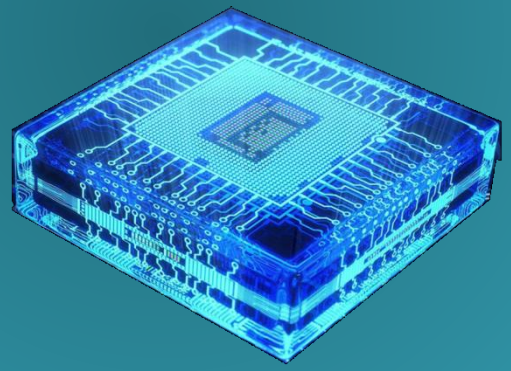
Microprocessors and Assembly language

Isfahan University of Technology (IUT)



Introduction to computing

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بسم الله الرحمن الرحيم

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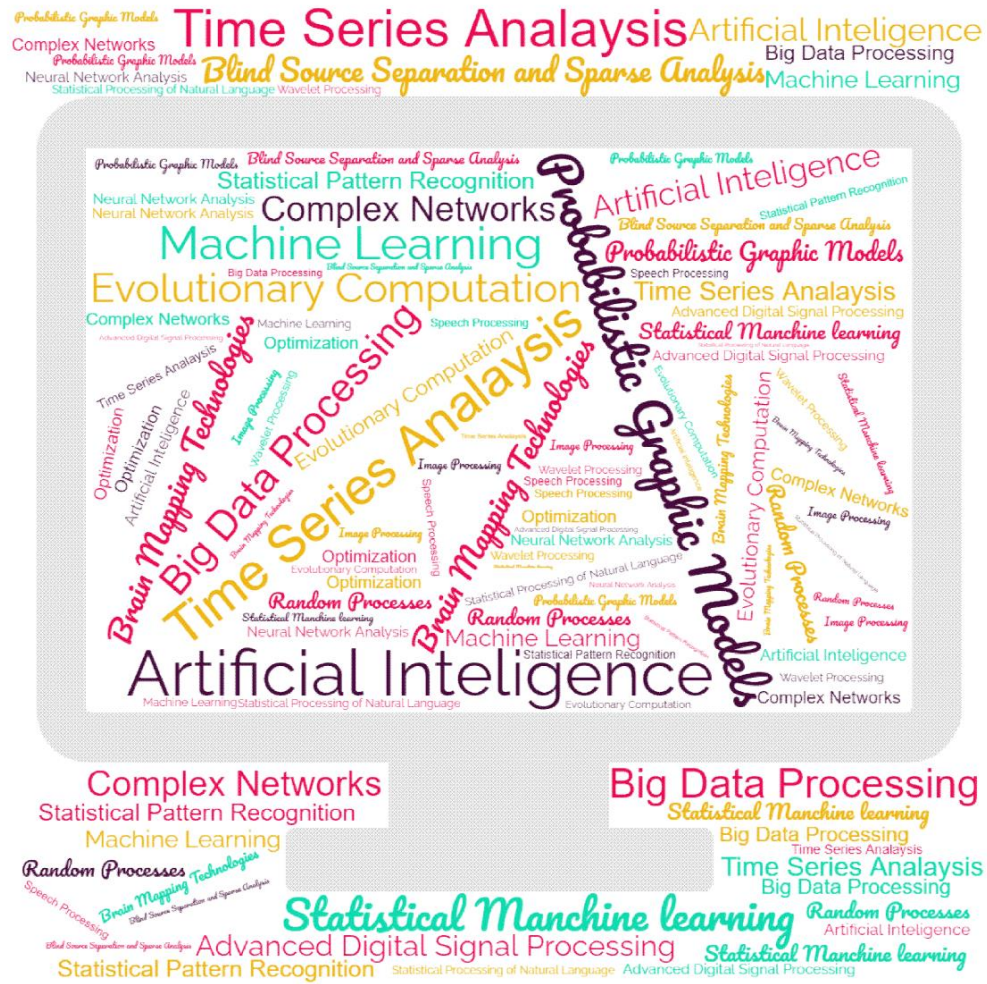
Background


Probabilistic Graphic Models
Time Series Analysis
Artificial Inteligence
Complex Networks
Big Data Processing
Blind Source Separation and Sparse Analysis
Machine Learning
Neural Network Analysis
Statistical Processing of Natural Language
Wavelet Processing
Statistical Pattern Recognition
Complex Networks
Machine Learning
Evolutionary Computation
Big Data Processing
Brain Mapping Technologies
Time Series Analysis
Artificial Inteligence
Statistical Manchine learning
Advanced Digital Signal Processing
Optimization
Random Processes
Neural Network Analysis
Speech Processing
Image Processing
Wavelet Processing
Big Data Processing
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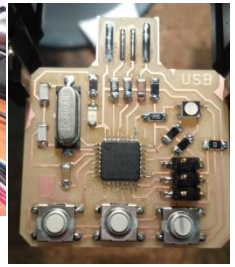
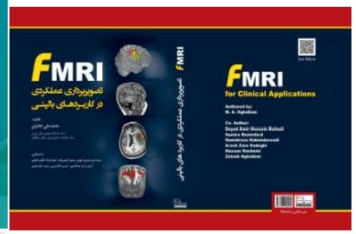
Statistical Pattern Recognition
Statistical Processing of Natural Language
Advanced Digital Signal Processing



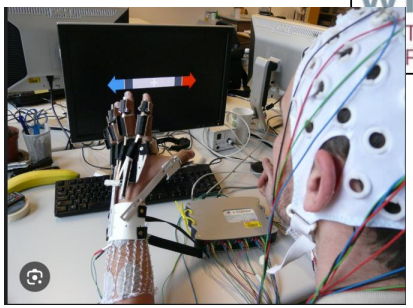

JOURNAL OF NEURAL ENGINEERING


Digital Signal Processing

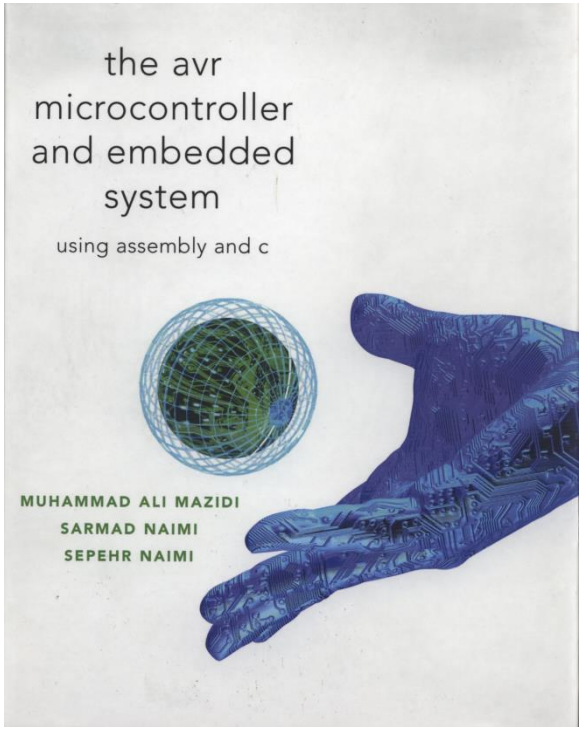

FMRI
FMRI
for Clinical Applications

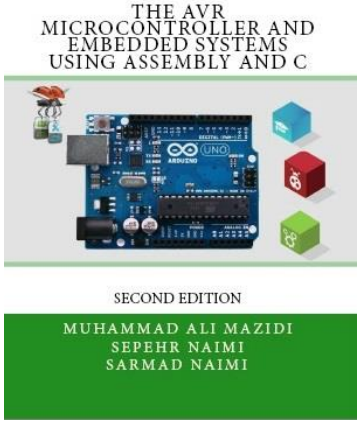

frontiers
in Human Neuroscience


WIPO | PCT
The International
Patent System

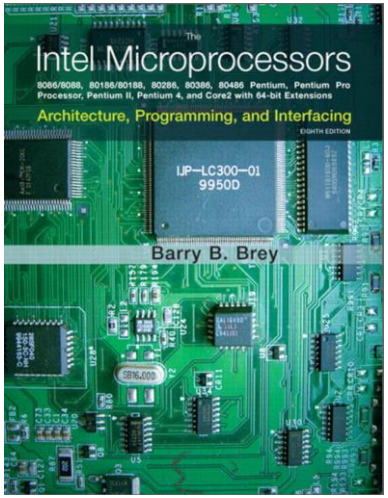


References





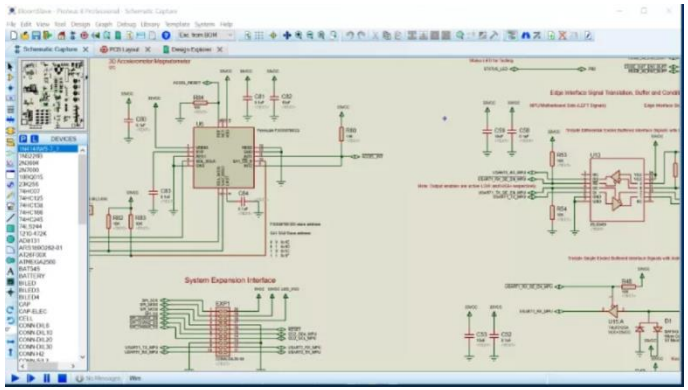
Sepehr Naimi



Grades

- Exercises: 5 points
- Exams and Quizzes: 13 points
- Project and presentation : 2 Point

+ collaboration and class attendance



Learning Outcome

At the end of the course, student should be:

- Able to understand the basic operation of microprocessor.
- Able to understand the basic concept of microprocessor architecture and its pins configuration.
- Able to understand the machine language programs.
- Able to design and write programs in assembly language.
- Able to understand the basic concept of microprocessor input/output interfacing.

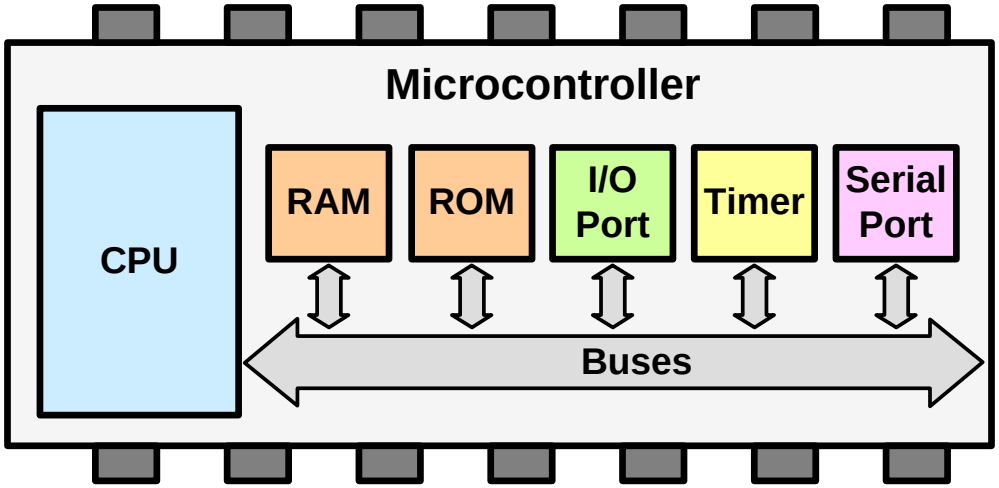
Create Your Idea !!!

Patent or DIY project

Some Application

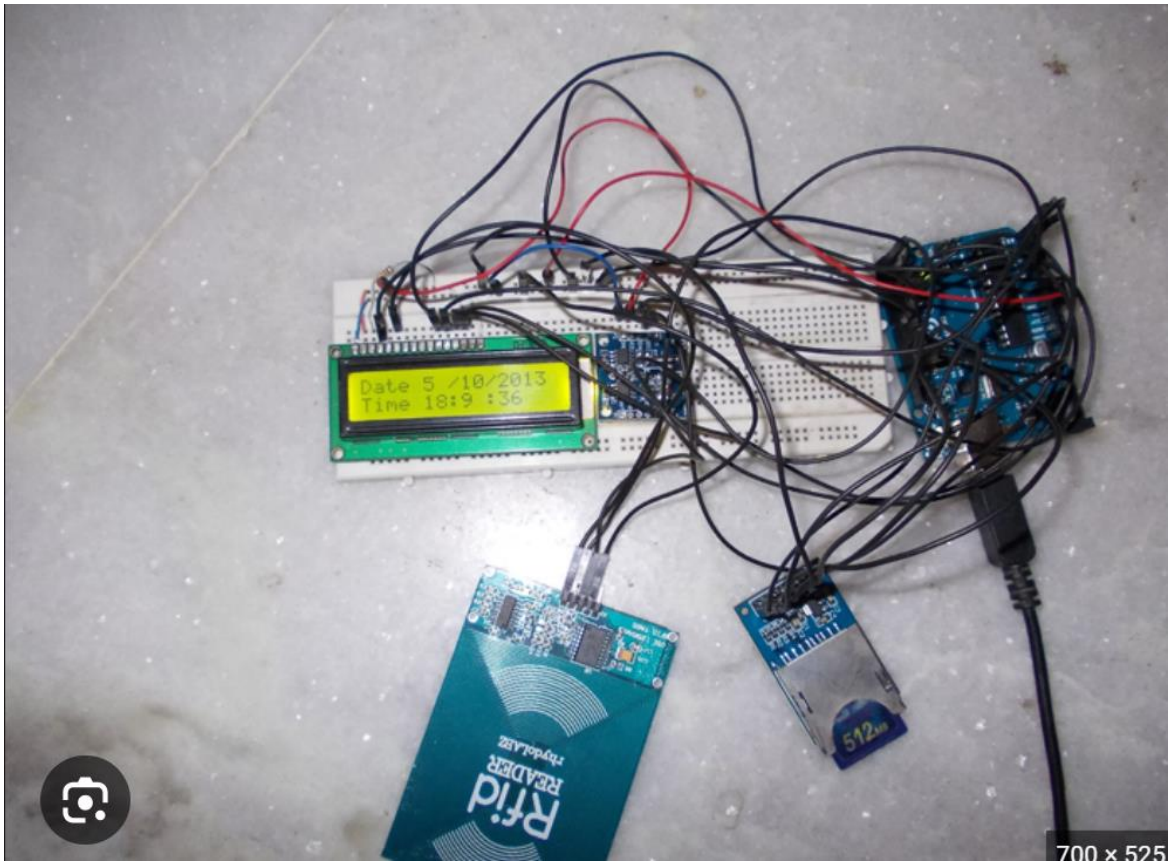
- AVR Projects: Digital Soil Moisture Meter. ...

How does it work?
Price?


Microcontroller
CPU
RAM
ROM
I/O Port
Timer
Serial Port
Buses

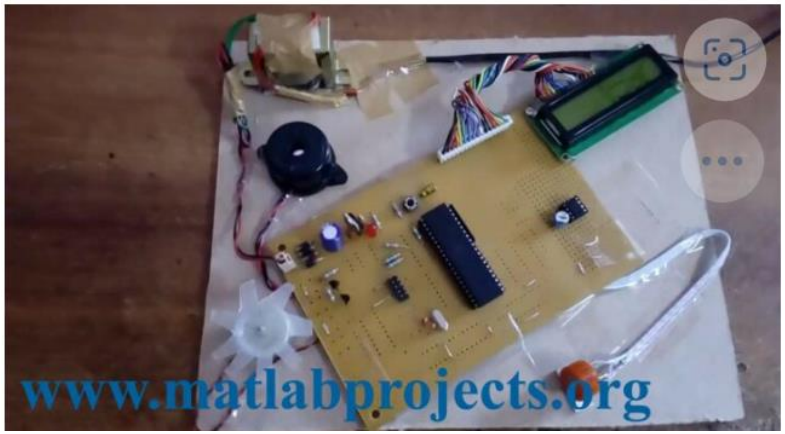
Some Application

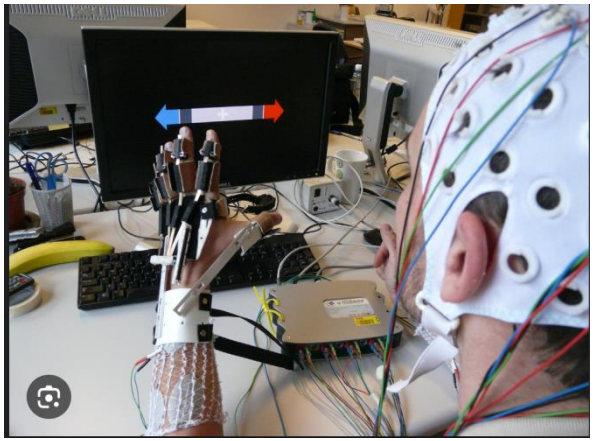
- RFID Based Attendance System. ...

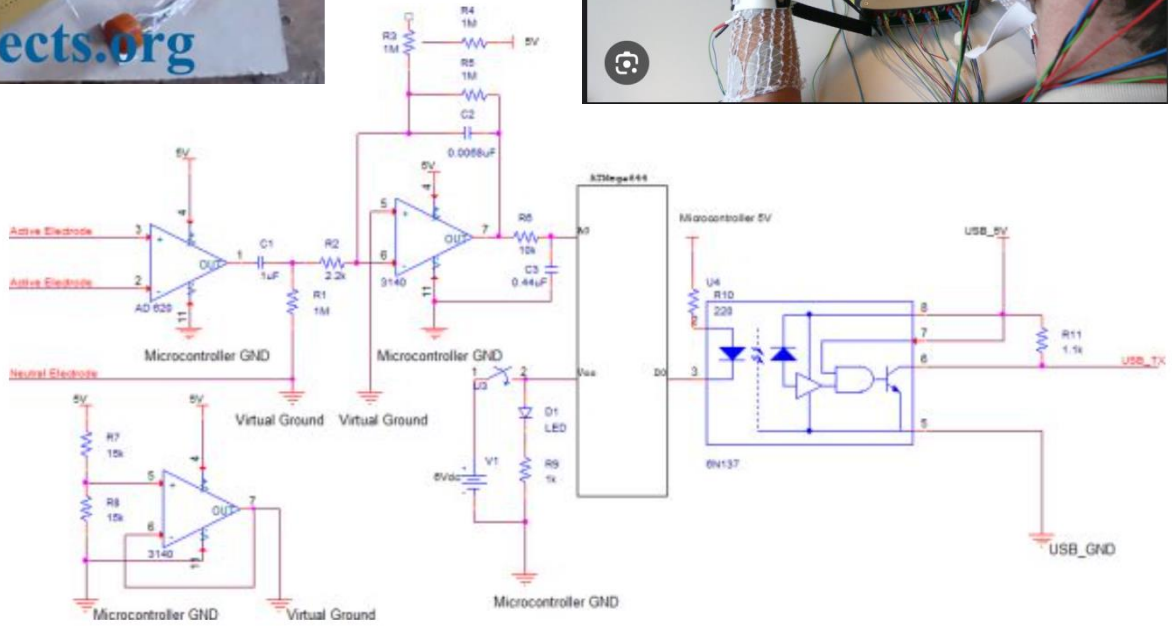


Some Application

- **Brain Computer Interface**

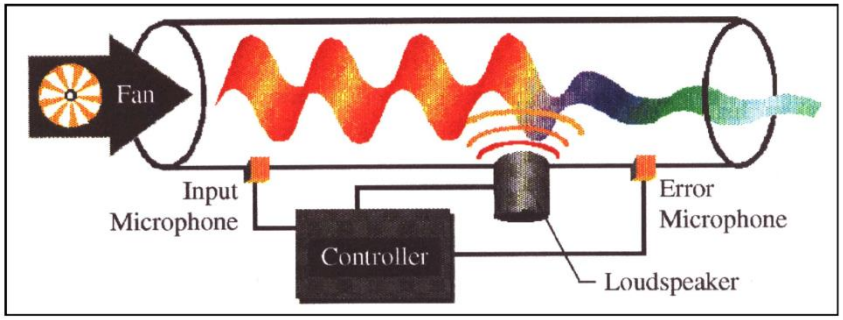


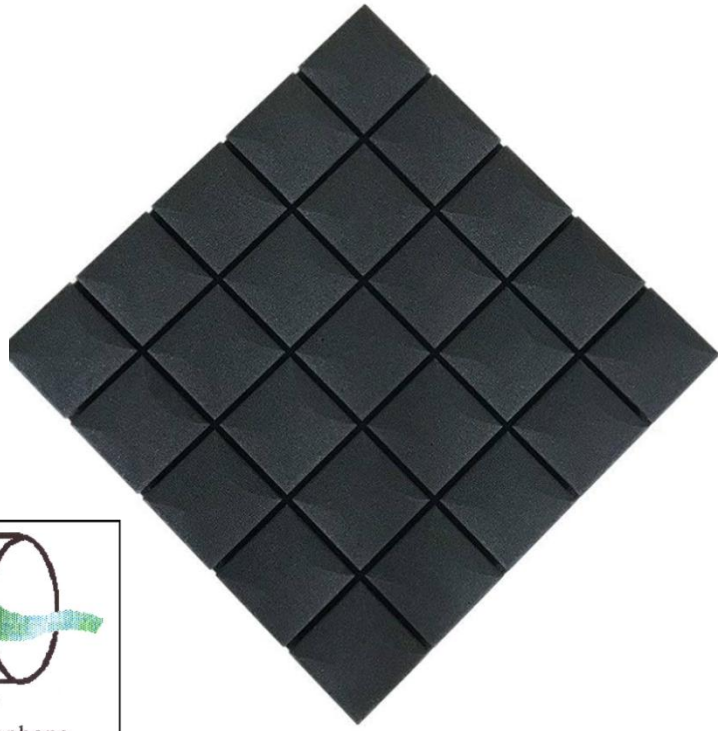




Some Application..

- Active noise cancelation





Some Application

- IOT….
- Sonar Water-Level Meter. ...
- AVR Projects: Android Phone-Controlled Robot. ...
- Temperature Controlled DC Fan. ...
- Hydrogen Gas Monitoring and Alarm System. ...
- Line Follower Robot.
- More Idea in file

  Top 30 DIY IoT Projects - From Basics to Advanced Level Internet of Things Projects & Tutorials

Course overview

- Microprocessors Architecture
- Programming(ASM-C)
- Interfacing input/output

Course overview…

- Microprocessors History
- Some Reviews(Number System)
- Memory and Bus Architecture
- CPU Architecture (8-bit RISC single-chip-AVR)
- Assembly Language Programming (AVR)
- C Language Programming (AVR)
- How work with others
  - LCD, Interrupt, timer, interface,…

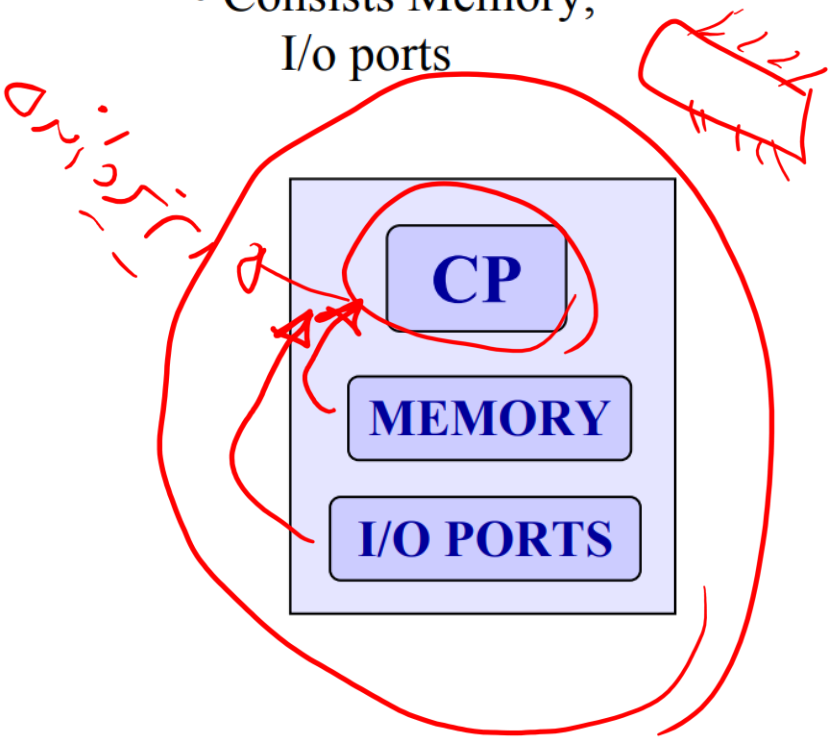
Some Concept?

- Why Learn Assembly?
  - New Hardware
  - Reverse Engineering
- Why Micro?
- OS and CPU

Micro-controller vs. Micro-processors

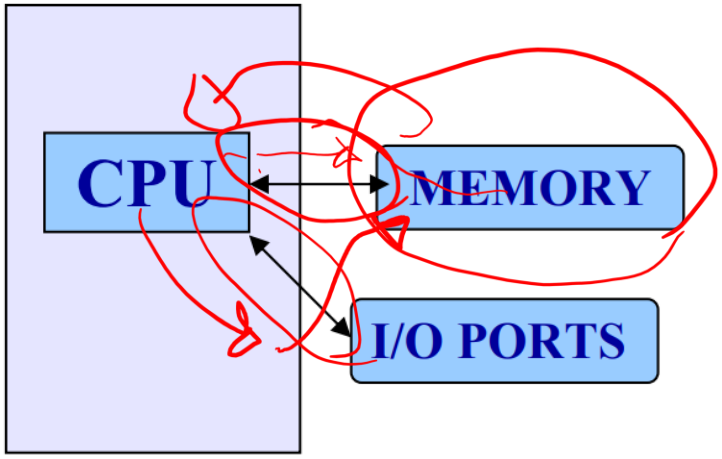
MICRO CONTROLLER

- It is a single chip
- Consists Memory, I/o ports



MICRO PROCESSER

- It is a CPU
- Memory, I/O Ports to be connected externally



Question?

Your Name, ID, Major

Q1: What project have you done so far that you think is most relevant to Microprocessor?

Not necessarily research project; can be your course project or any hackathon event you participated in.

DIY Project

- find a microcontroller project
  - https://circuitdigest.com/article/top-30-diy-iot-projects-from-basics-to-advanced