

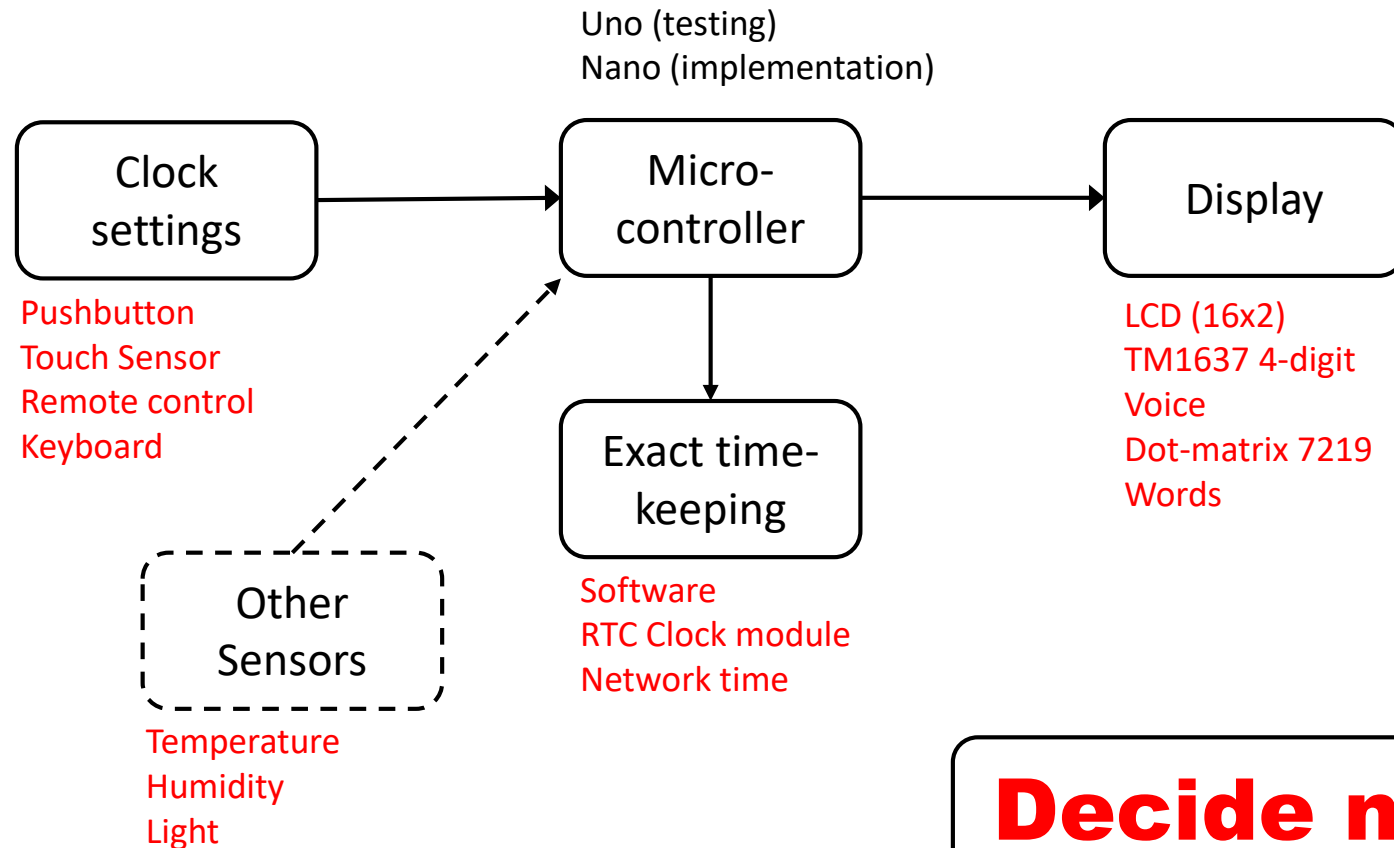
# EP1000

## Project-1-Planning

# Planning

- Most important phase in your project
- Decides your route and what you have to do
  - Provides a plan for the next few weeks
  - Decide on what equipment to use
  - Allows for parallel work
- You will always NOT have enough time
  - Scope your project
  - Don't forget your documentation (25%)
  - Do what you can, move on.

# Create an overview



# Decide ....why?

- Affects your project
  - Complexity of the project
  - Components availability
  - Software development
  - Physical design of the project (25%)
- Decide, based on
  - Familiarity with components
  - Available software and examples
  - Available designs

# Time planning

Week	Time allocation	Purpose	
1	4 hr	Get specifications, sizing Sketch project Draw design using Fusion 360 Documentation	Sketches, .F3D, specifications, measurements
2	4hr	Laser cut, 3D print design Start micro-controller testing Documentation	Lab work (closures?), start testing
3	4hr	Complete project test Start fitting Integration	Software development, testing, Integration
4	4hr	Integration of components Documentation Presentation slide, video	Integration, documentation, presentation

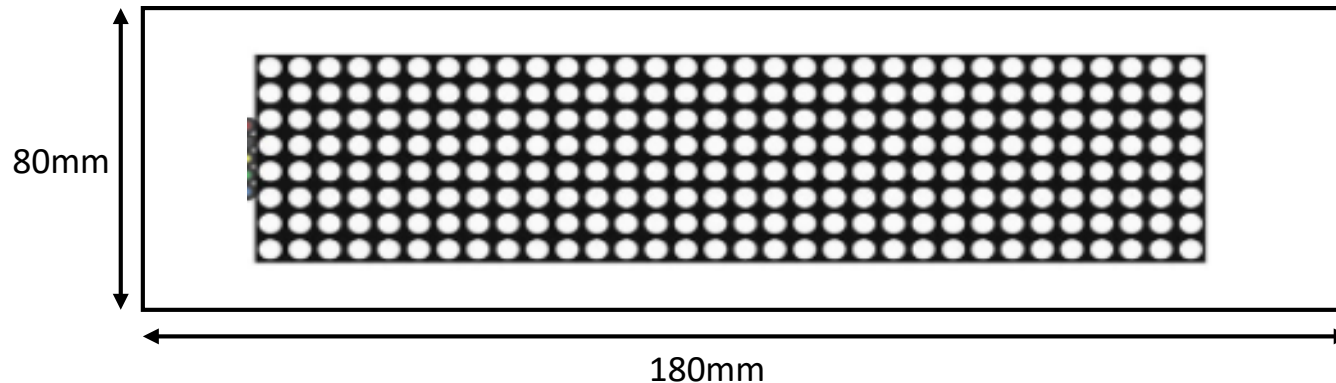
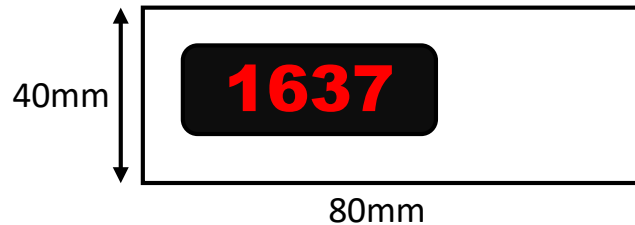
# Specifications

- Get specification sheets on ALL items
  - Example:
    - Uno R3
    - Nano
- Get dimensions of ALL components
- Do a mock-up of your project
  - Use cardboard, paper, foam, scrap
  - Size up the items, do not physically oversize, undersize
- Sketch, measure proposed design

# Physical design

- Sketch a design
- Dimension your design
- Decide what to
  - Laser cut (flat surfaces, stacking, enclosures)
  - 3D Print (irregular shapes, moving parts, holders)
- Make allowances
  - for redos, mistakes
  - lab closures, bookings, time/space allocation
  - Over-exactness

# Physical Design

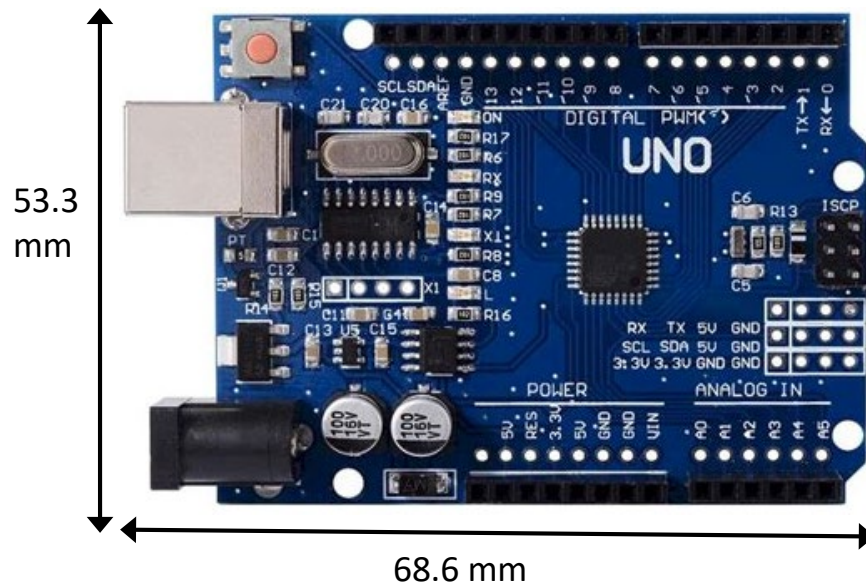


Deciding on your components affects the size and shape of your physical system

Do a **MOCK UP!**

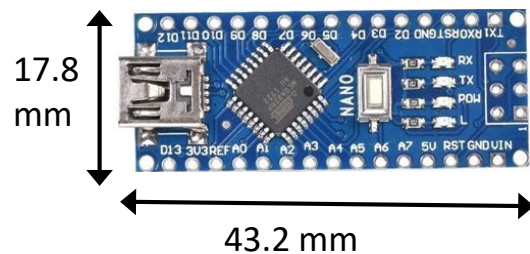


# Test vs Implementation



All testing to be done with the UNO board

- Easy connections
- USB & Power
- Lots of examples
- Easy testing!



All implementation to be done with the Nano board

- Connections are there (same as UNO)
- Mini-USB, No Power (except 5V)
- Uses ATmega328 (same processor), so runs the same code
- Need to solder wires/pins

# Other considerations

- Pins vs Wires
  - Pins need a mini-breadboard
  - Wires need soldering (another skill?)
  - May need multiple GND and Power
- How to transfer code from UNO to Nano
- Start, Stop, Pause buttons ?
- Power considerations
  - 5V, GND
  - Voltage regulation
  - Power sockets (no USB connections)
  - Indicators

# Implement a design

- Design drawn using Fusion 360
- Learn how to assemble parts for fittings
- Vector/Raster graphics for decals, labels, artwork
- Documentation
  - Include all RAW files (.f3d, .jpg, .png)
  - Record machine settings
  - Write up your work

# EP1000

## Project-1-Planning

End