

ARDUINO IDE FAMILIARIZATION AND INTRODUCTION TO EMBEDDED C

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Installing Arduino IDE in Windows

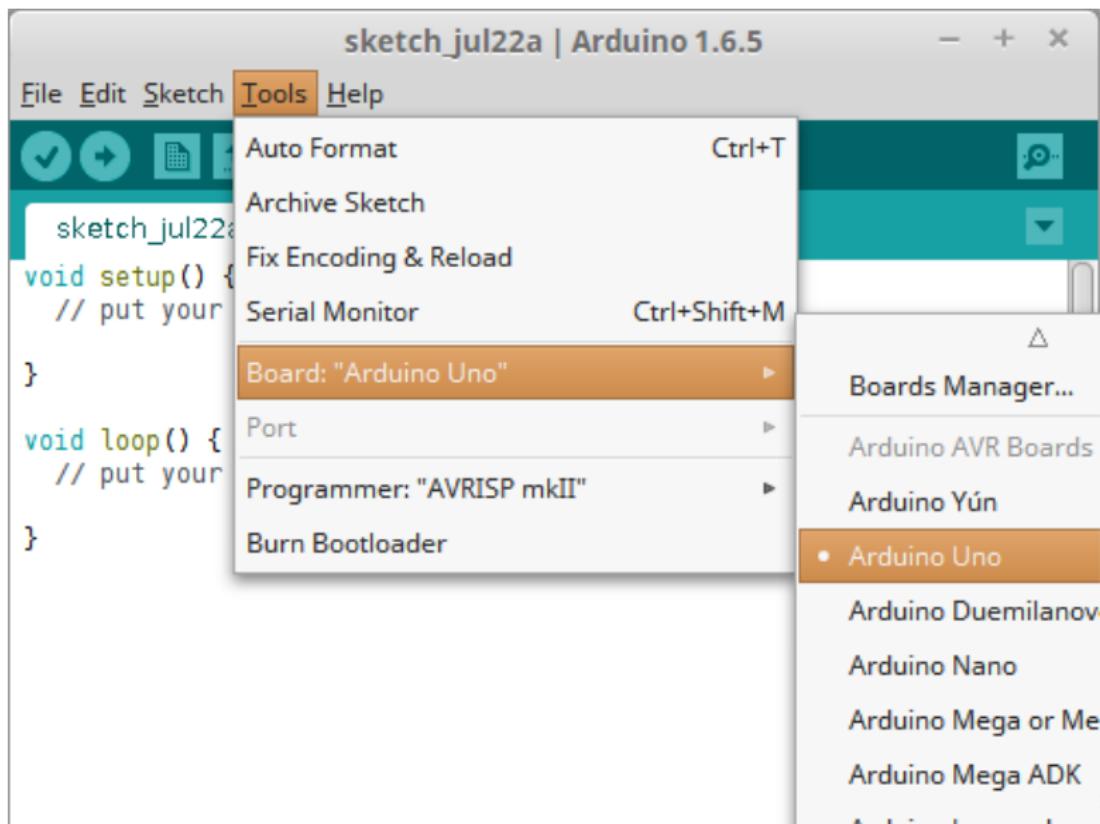
- Extract the arduino installation file from the support CD to the desktop



- Double click on arduino.exe to open the Arduino IDE

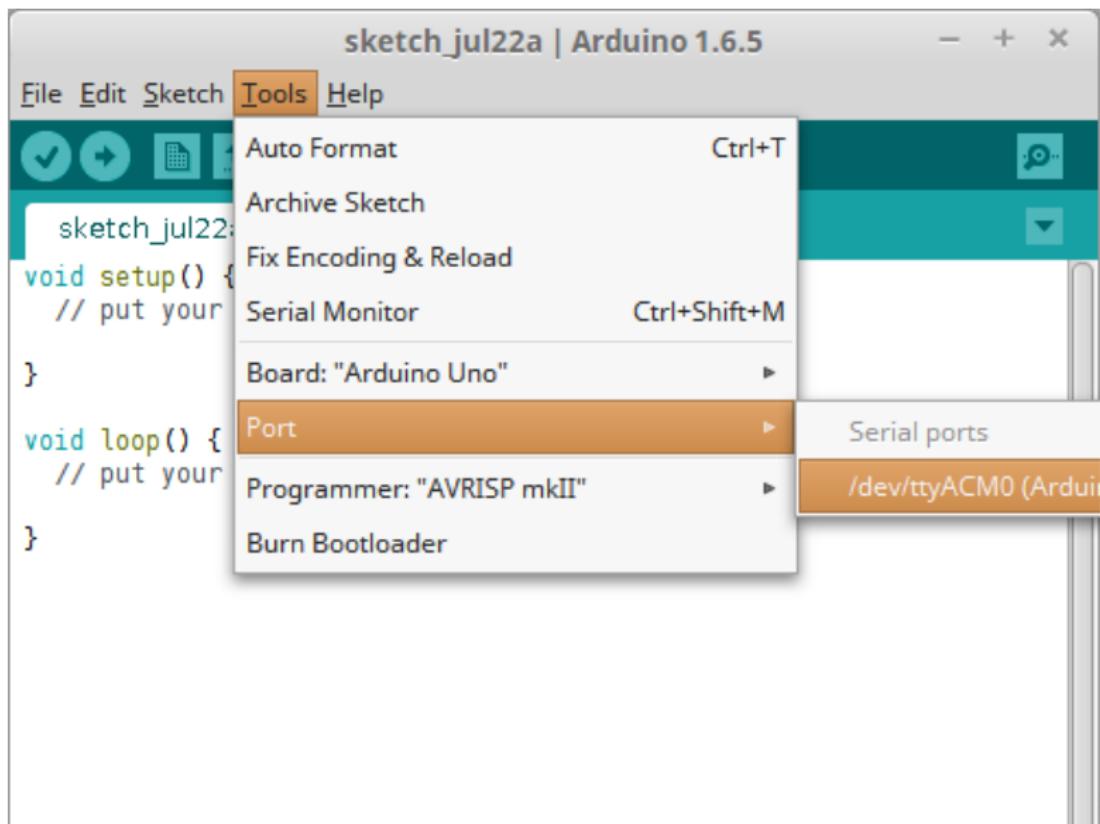
Choosing the right Board

- Tools → Board → Arduino UNO



Choosing the Serial Port

- Tools → Port → COMxx



Embedded C

- Language extension of C, used in embedded systems.
- Simpler to understand, learn and use.
- Machine Independent.
- Can be used in any microprocessor/microcontroller.
- Uses simple commands to control the device, so occupies less memory.
- C; can also be called as mid-level program, since it is closest to assembly language.
- Efficient, reduced overhead and development time.

Data Types

- char -8 bits
- int -16 bits
- long -32 bits
- float- 32 bits
- double- 64 bits
- long double- 80 bits

Arduino Coding Framework

The screenshot shows the Arduino IDE interface with the title bar "sketch_jul22b | Arduino 1.6.5". The menu bar includes File, Edit, Sketch, Tools, and Help. The toolbar features icons for Save, Run, Open, Upload, and Download. The code editor displays the following sketch:

```
sketch_jul22b.ino

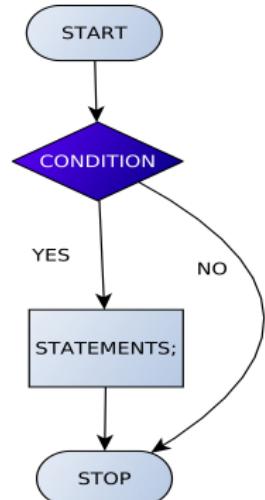
void setup() {
  // put your setup code here, to run once:
  // hardware initialisations should be done here
}

void loop() {
  // put your main code here, to run repeatedly:
  // infinite loop -- microcontroller code will never exit
}
```

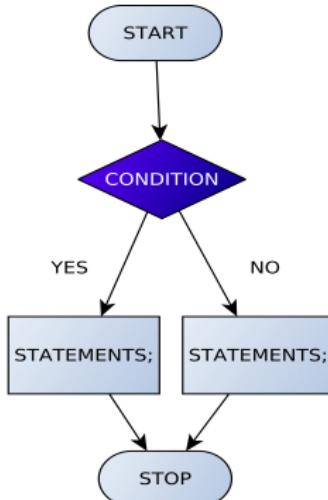
The code consists of two functions: setup() and loop(). The setup() function contains comments about running once and initializing hardware. The loop() function contains comments about running repeatedly and never exiting.

Branching

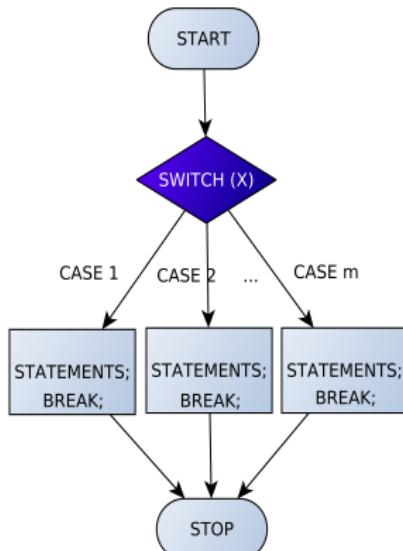
if



if else



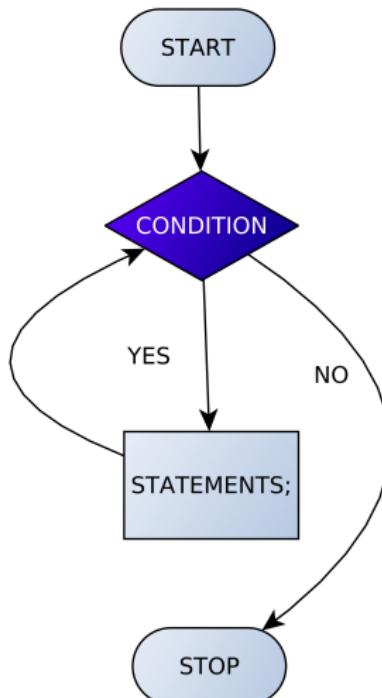
switch case



Task: Write a program to turn on fan when the temperature is greater than or equal to 35°C.

Looping

- for
- while
- do while



Task: Write a program to blink an LED for 1 second using 1 millisecond delay.

Function Calling

sketch_jul22b | Arduino 1.6.5

File Edit Sketch Tools Help

sketch_jul22b §

```
// hardware initialisations should be done here
}

void loop() {
    // put your main code here, to run repeatedly:
    // infinite loop -- microcontroller code will never exit
    function1(); // function calling
    function2(a,b); //function calling with arguments

}

// function definitions
function1() {
    ...
}
function2(int a, int b) {
    ...
}

Save Canceled.
```

Tomorrow's Session

- Arduino hardware Familiarization
- Arduino Based Design Session

SEE YOU TOMORROW