

Galileo - Getting Started

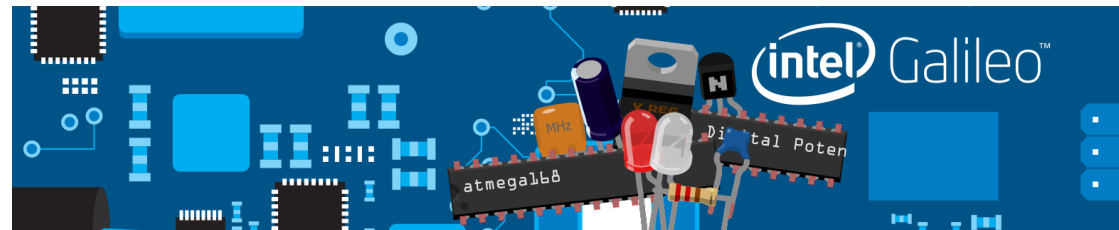
hadrihl // hadrihilmi@gmail.com

khai // khairolnadzrinsaafi@gmail.com

CST131 Computer Organization

Saturday December 6 2014 // {9-11am,11am-1pm,2-4pm}

Lab 1 & 2, Level 3, School of Computer Science, USM



Accessibility

Account: Workshop

Password: “workshop123”

Definition

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microcontroller

/ˈmaɪkrə(ʊ)kənˌtrəʊlə/

noun **COMPUTING**

noun: **microcontroller**; plural noun: **microcontrollers**; noun: **micro-controller**; plural noun: **micro-controllers**

1. a control device which incorporates a microprocessor.

Translate microcontroller to

Use over time for: microcontroller



Mentions

1800 1850 1900 1950 2010

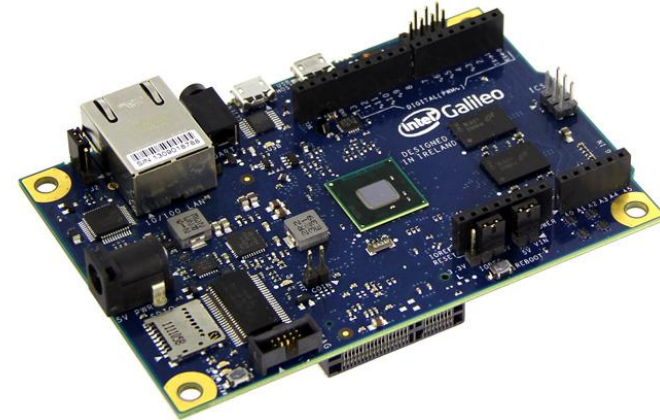
So a microcontroller huh..so what's a big deal??

- It is a big deal!



Intel Galileo

- Intel Quark processor (SoC) 400MHz
- 256 MB of DRAM
- Connectivity
 - Mini-PCIe slot, 100MB ethernet port, Micro SD slot, Serial RS232, USB host and client ports.



Galileo

First time installation & quick troubleshooting

7zip

- Download and install



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Download

Download 7-Zip for Windows:

7-Zip 9.20 2010-11-18	Type	Windows	Description
Download	.exe	32-bit x86	7-Zip for 32-bit Windows
Download	.msi		
Download	.msi	64-bit x64	7-Zip for 64-bit Windows x64 (Intel 64 or AMD64)
Download	.msi	IA-64	7-Zip for IA-64 Itanium CPU
Download	.exe	ARM	7-Zip for Windows Mobile / Windows CE (ARM)
Download	.zip	32-bit	7-Zip Command Line Version
Download	.tar.bz2	Any	7-Zip Source code
Download	.7z	32-bit	7z Library, SFXs for installers, Plugin for FAR Manager
Download	.tar.bz2	Any	LZMA SDK (C, C++, C#, Java)

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p7zip is the command line version of 7-Zip for Unix/Linux. made by an independent developer.

Download Intel Galileo Software


link : <https://communities.intel.com/docs/DOC-22226>


Galileo Software Downloads

 Version 23





created by marmstrong on Jan 7, 2014 4:29 PM, last modified by intel_jorge on Nov 15, 2014 1:47 AM

Software package release version 1.0.4.

See the  [Getting Started Guide](#) for step-by-step information on installing the software.

Important: Software downloads are also found in the  [release notes](#).

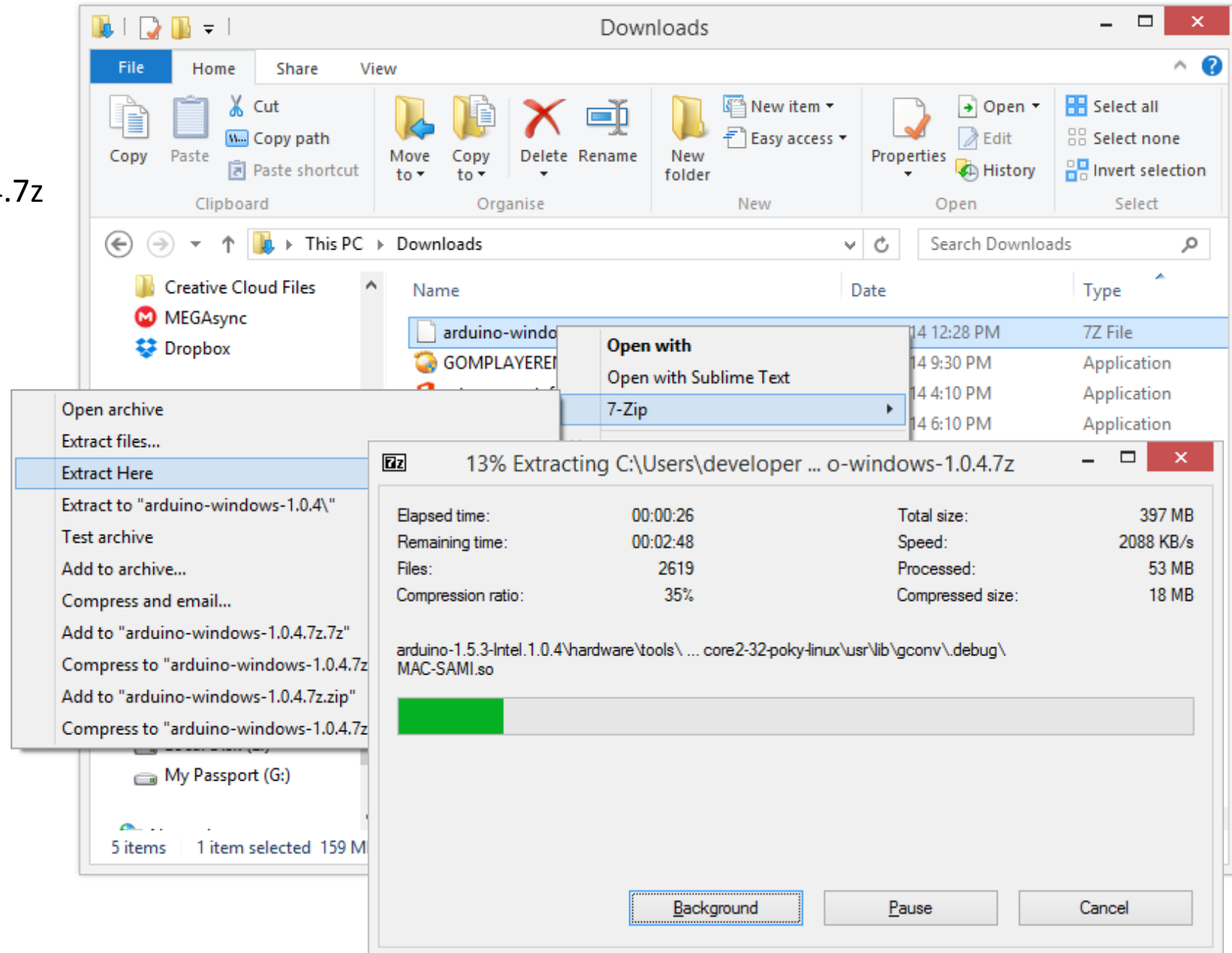
Download the zip file for your operating system (OS). Each OS zip file includes the latest firmware so you can use the IDE to update your board.

Link	Software	Operating system	Intel board	File size	File type
Download 	Arduino Software 1.5.3	Linux 32 Bit	Galileo	145 MB	.tgz
Download 	Arduino Software 1.5.3	Linux 64 Bit	Galileo	149 MB	.tgz
Download 	Arduino Software 1.5.3	Mac OS X	Galileo	112 MB	.zip
Download 	Arduino Software 1.5.3	Windows	Galileo	159 MB	.7z

Choose Windows if your system is Windows-based.

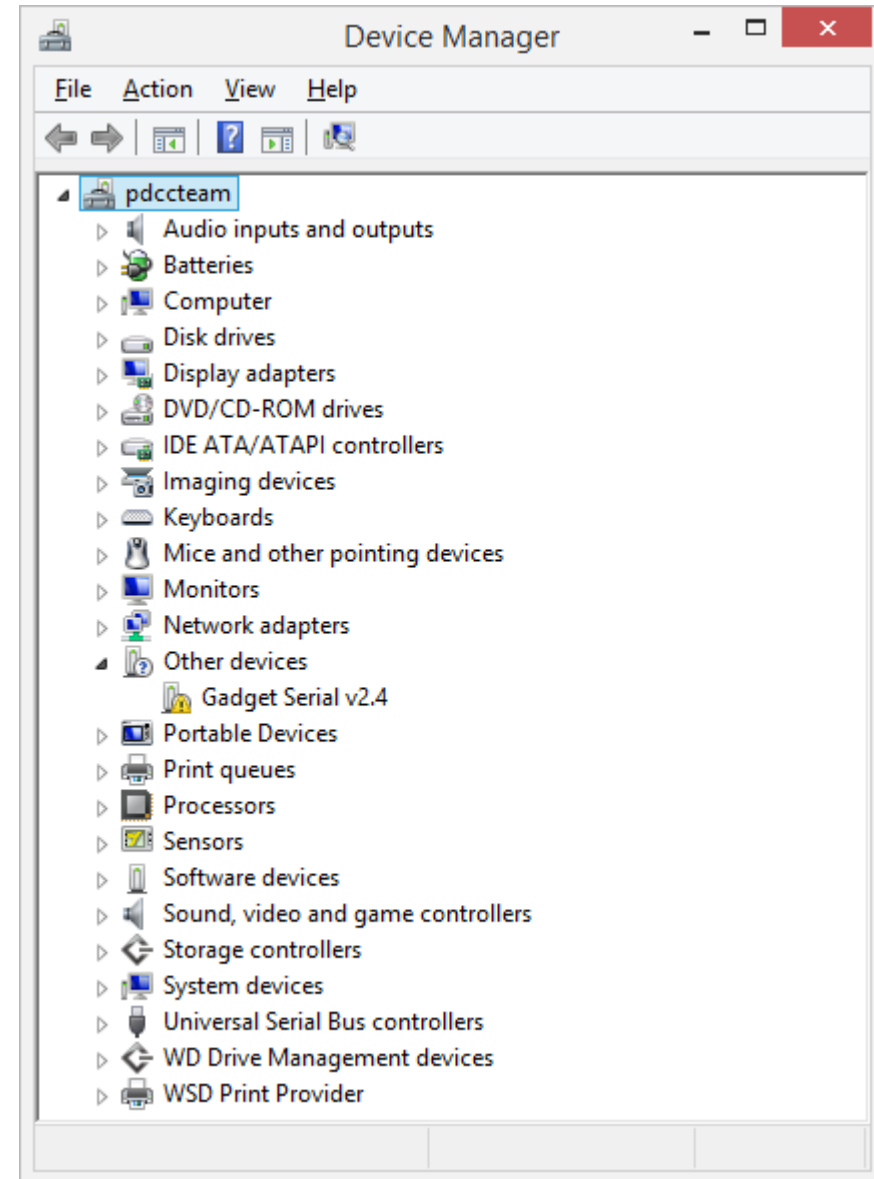
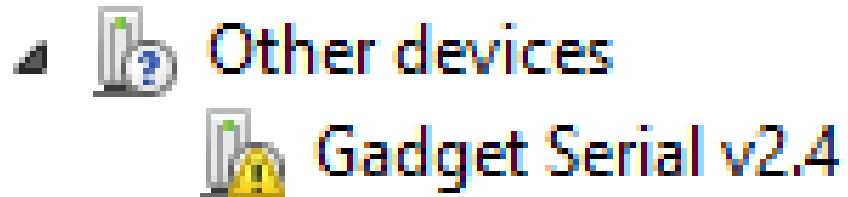
Extract

arduino-windows-1.0.4.7z



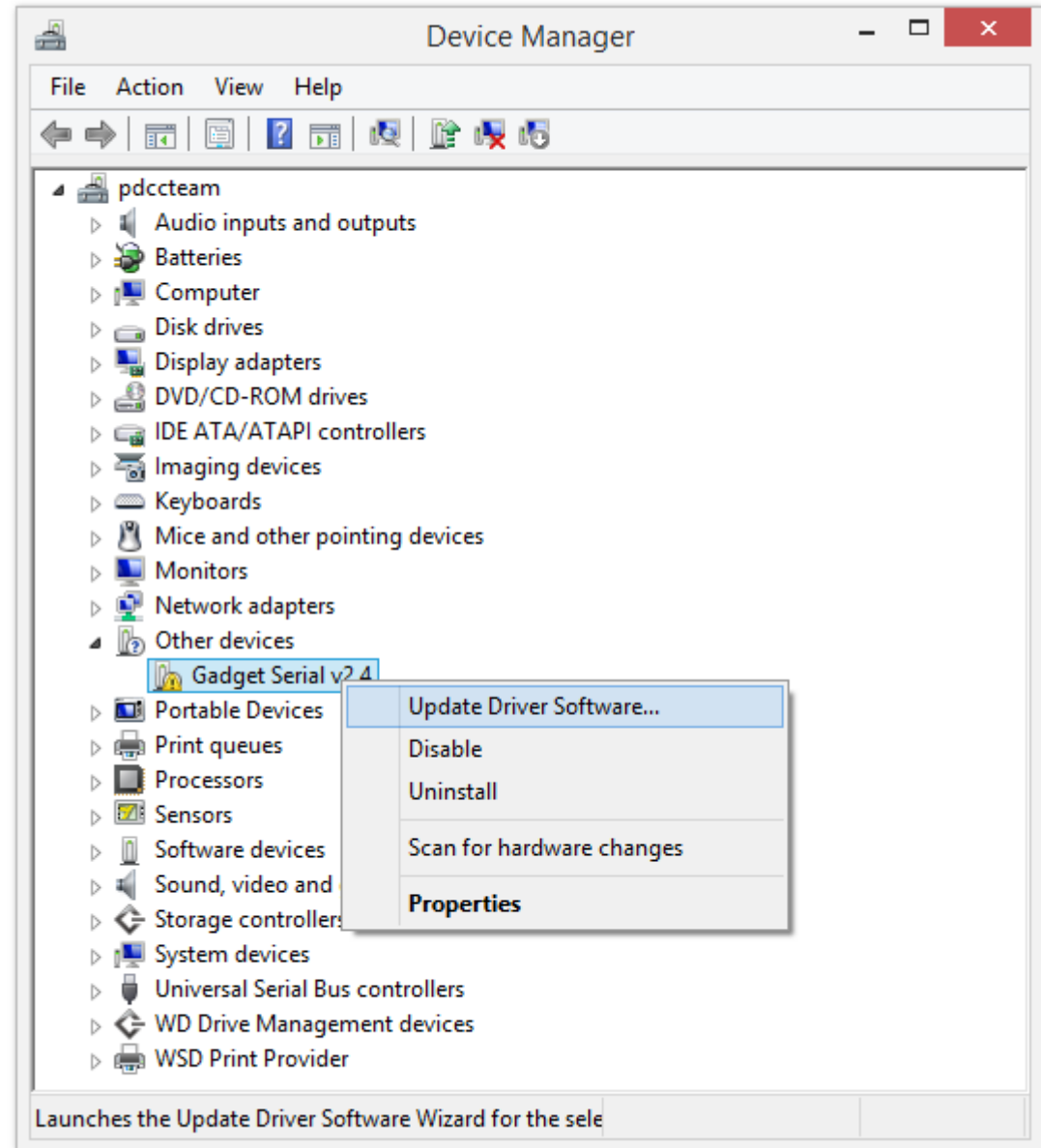
Connect Galileo to PC

- Check Device Manager
you may find “Gadget Serial v2.4”



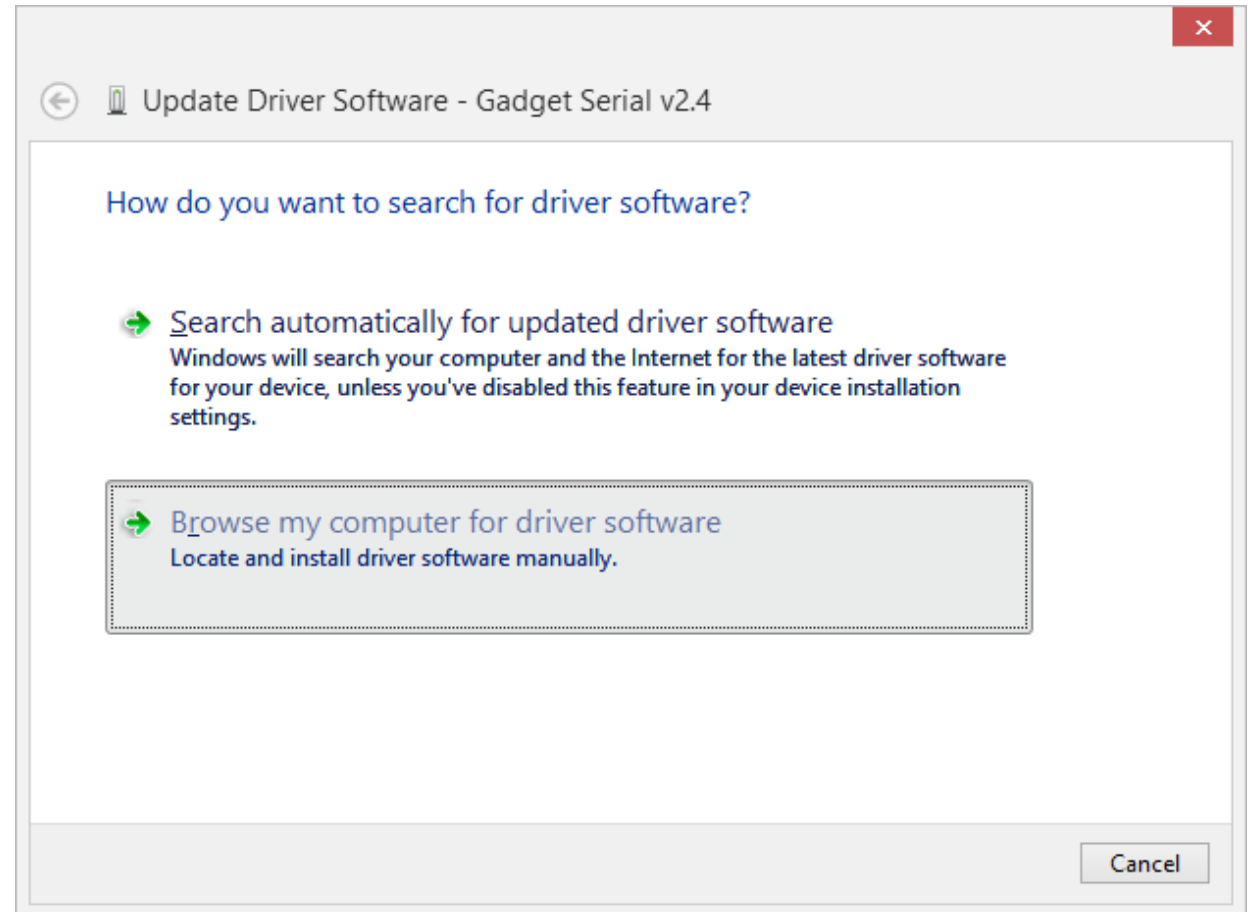
Install Galileo Driver

- Right click at
“Gadget Serial v2.4” and choose
“Update Driver Software...”



Install Galileo Driver (cont.)

- Choose
“Browse for driver software on your computer”



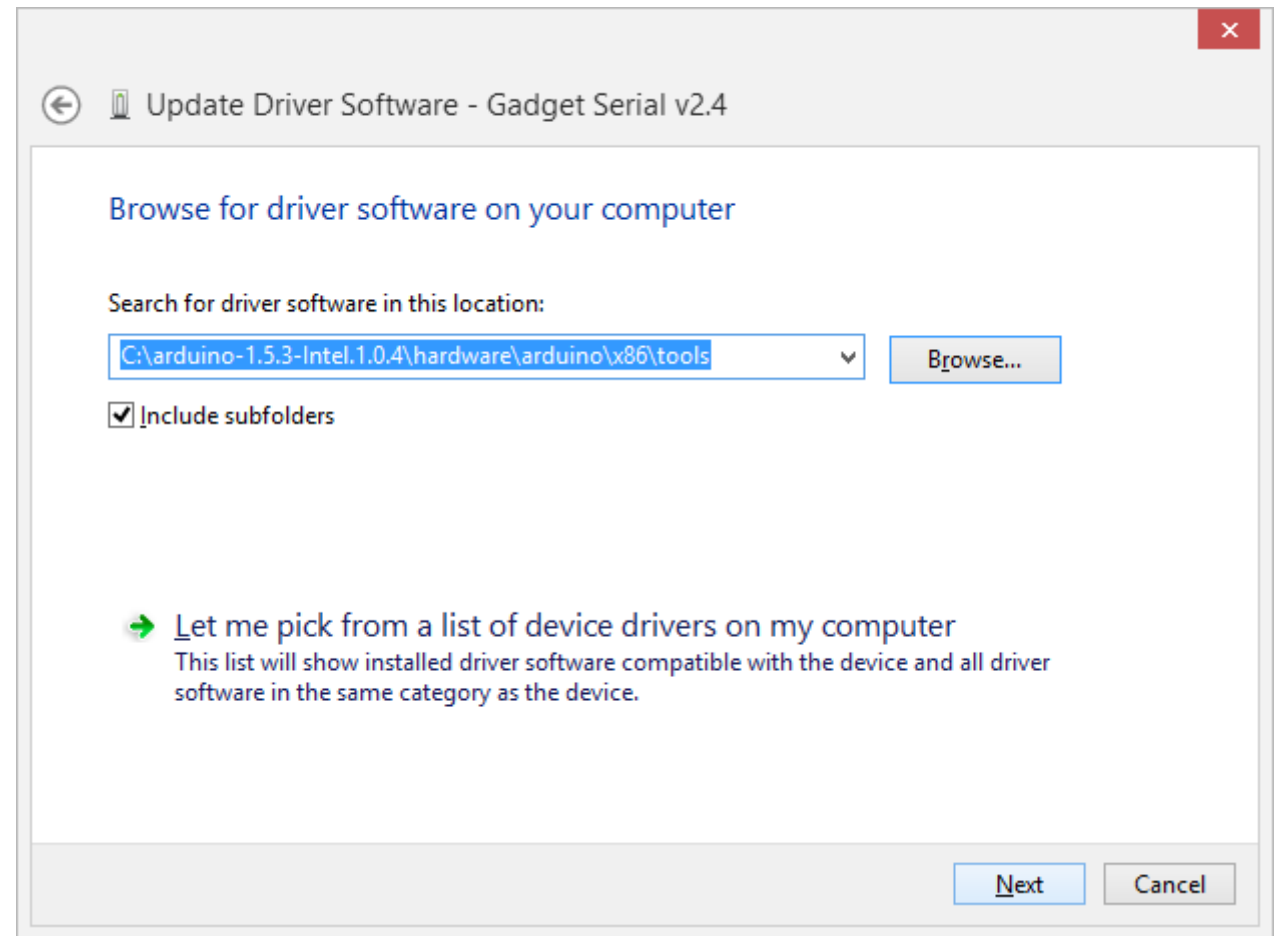
Install Galileo Driver (cont.)

- Select the path of driver

"C:\arduino-1.5.3-Intel.1.0.4\hardware\arduino\x86\tools"

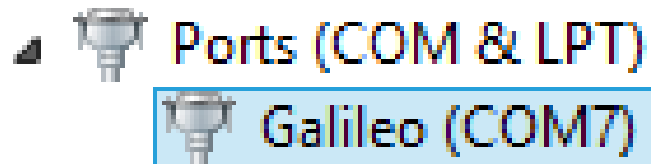
Info : the path may vary therefore make sure you know the path of extracted arduino IDE (arduino-1.5.3-Intel.1.0.4).

Galileo driver is located here:
arduino-1.5.3-Intel.1.0.4\hardware\arduino\x86\tools

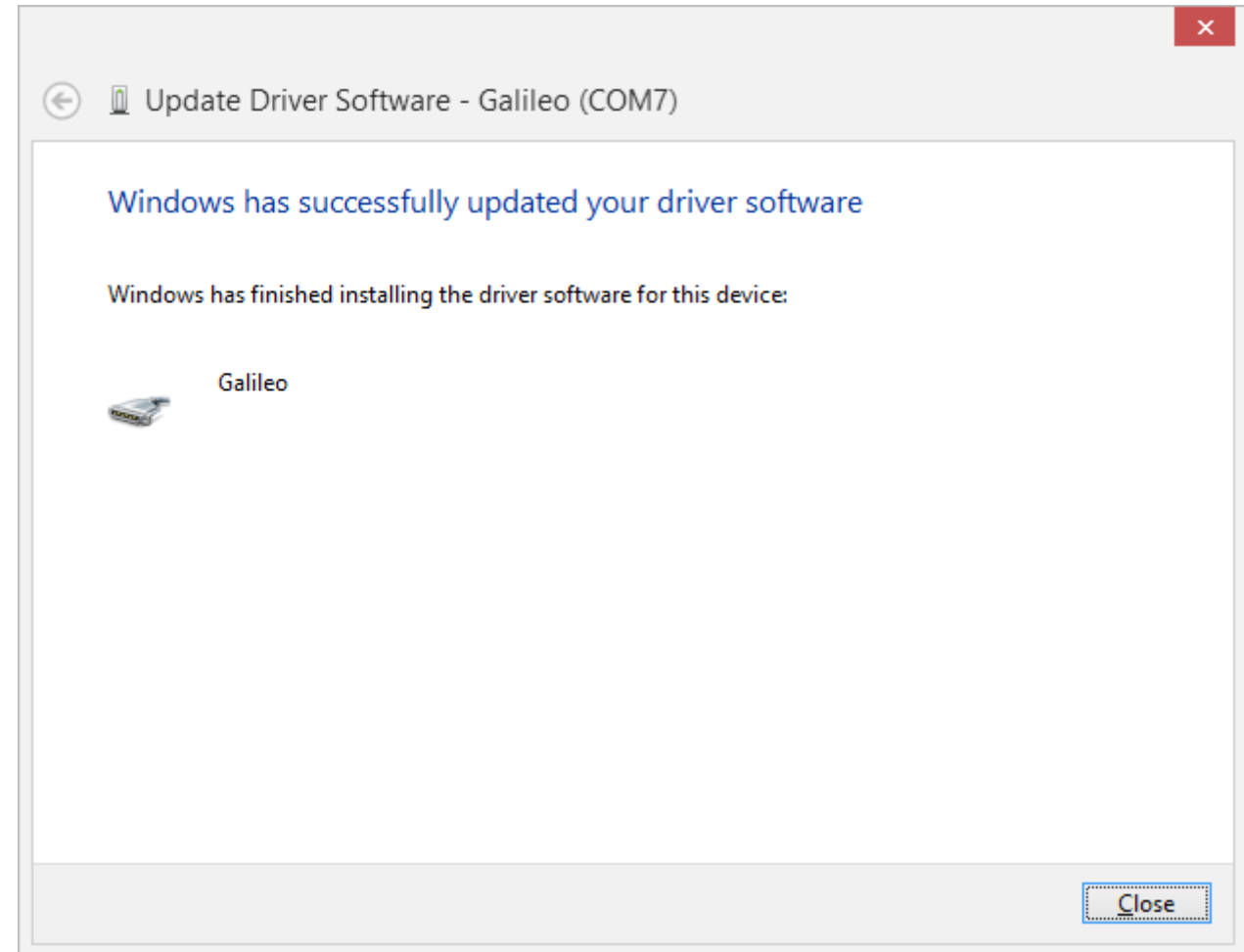


Install Galileo Driver (cont.)

- Upon successful installation

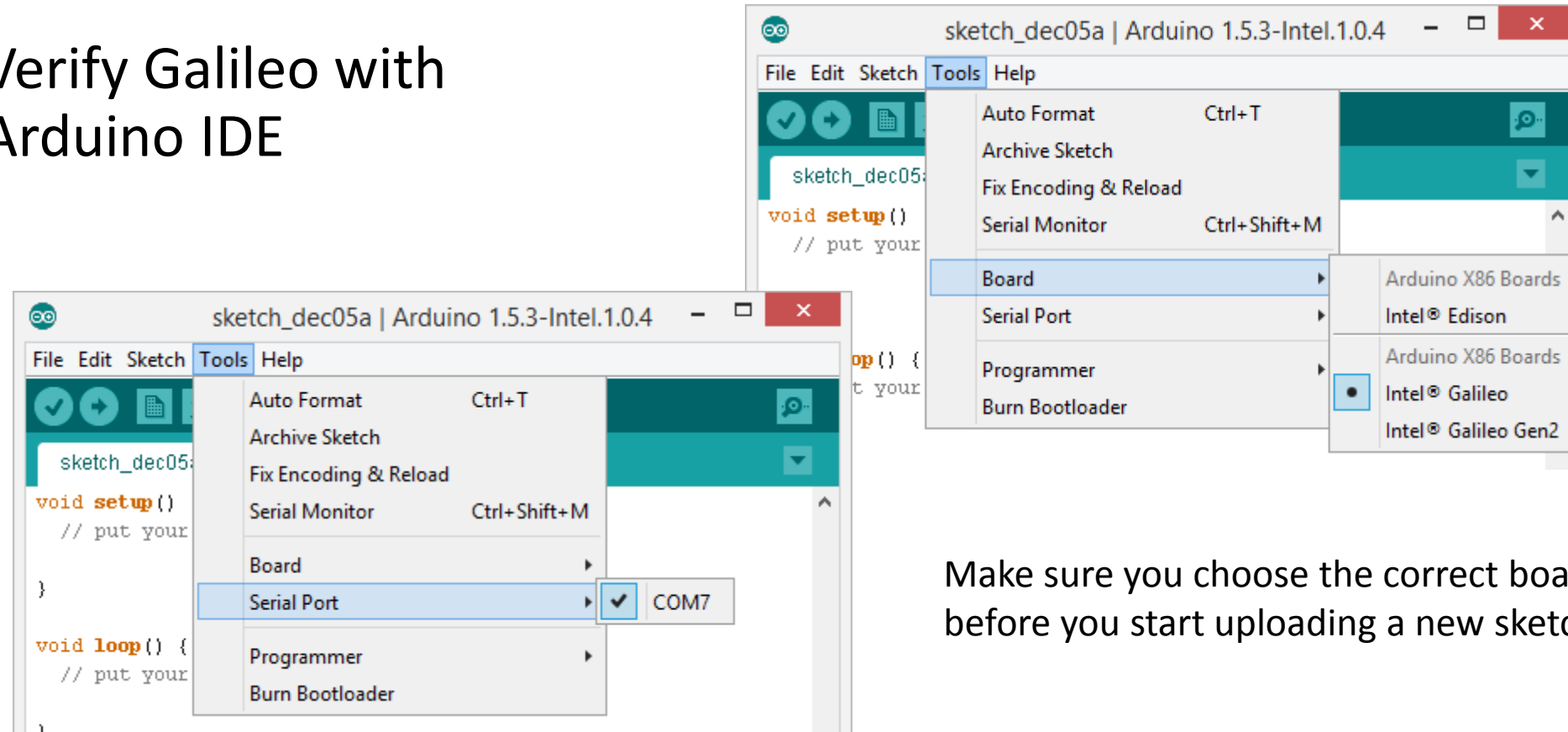


Galileo port will appear in Device Manager



Install Galileo Driver (cont.)

- Verify Galileo with Arduino IDE

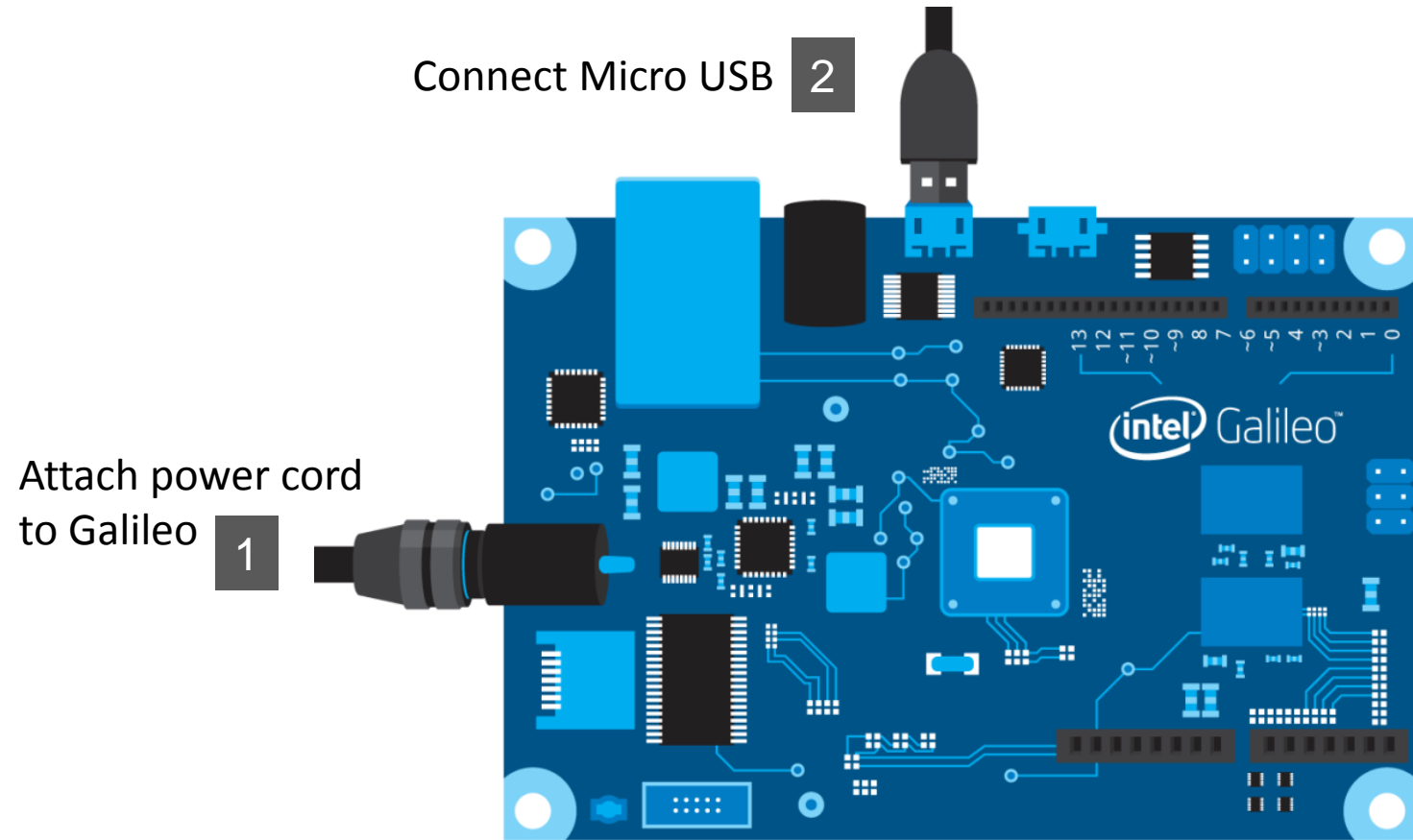


Make sure you choose the correct board and port before you start uploading a new sketch.

Quick Start

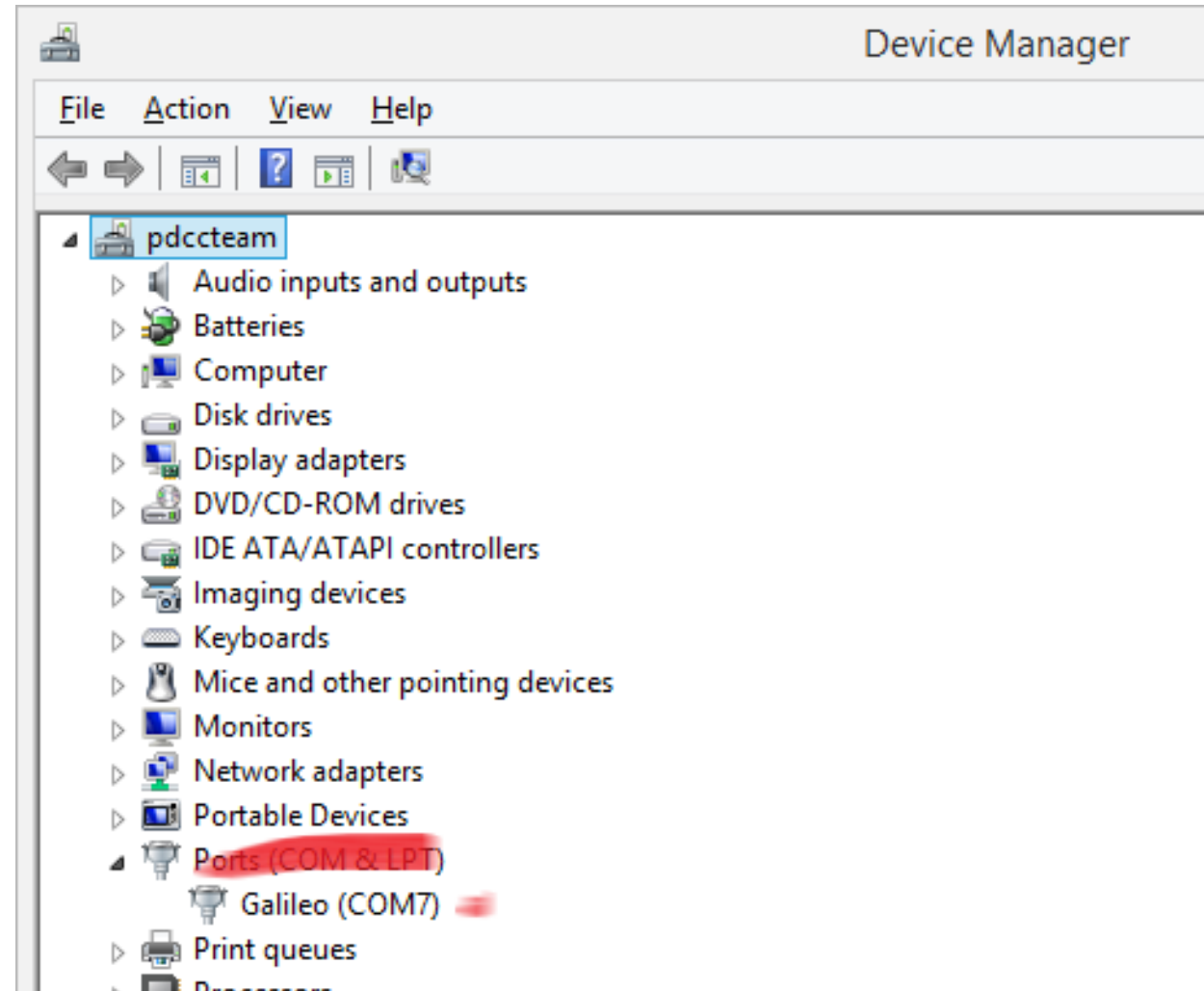
How to power on Intel Galileo board and verify connectivity

Connect Galileo

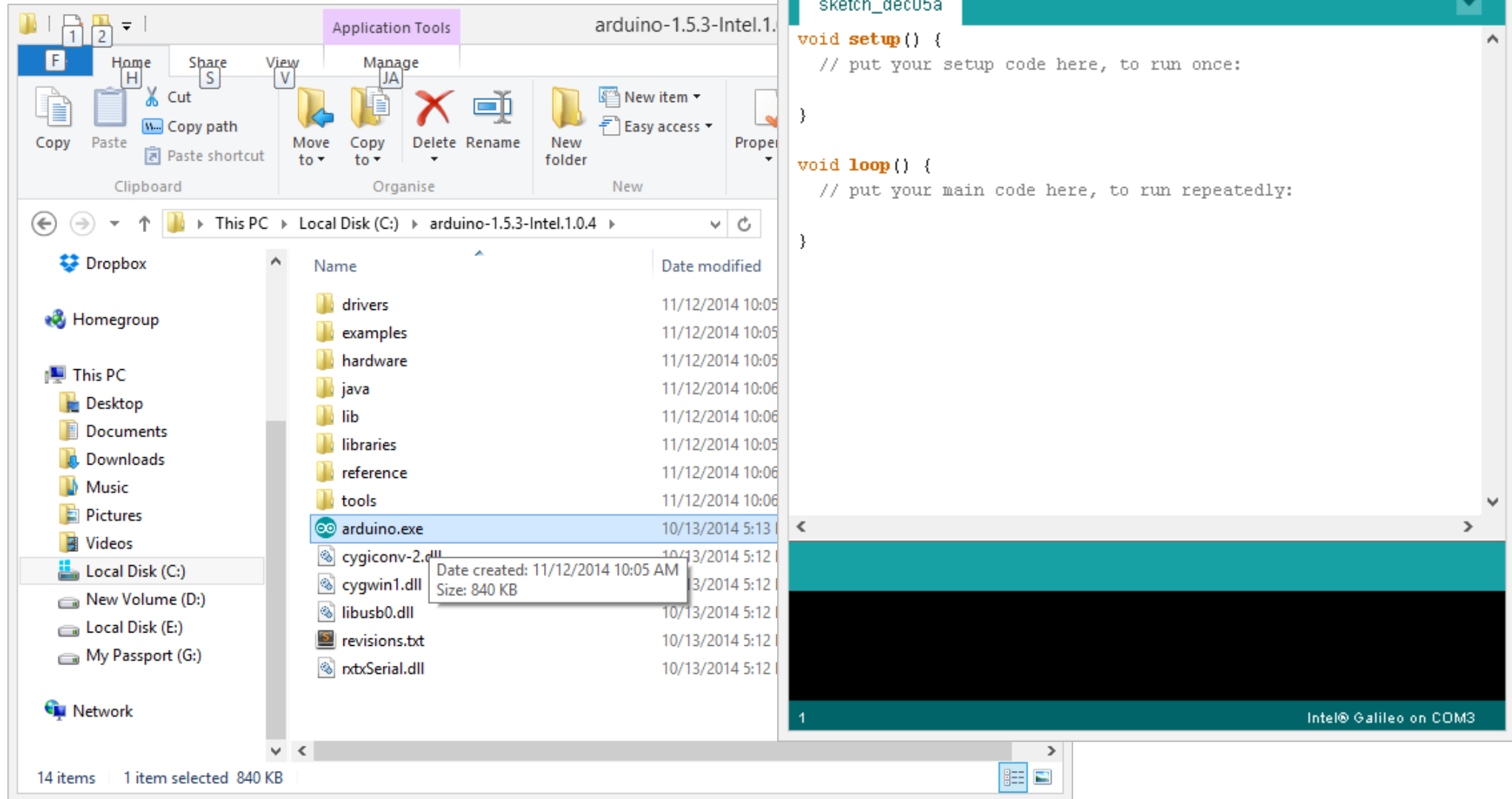


Check Device Manager

- Make sure Galileo port is presented

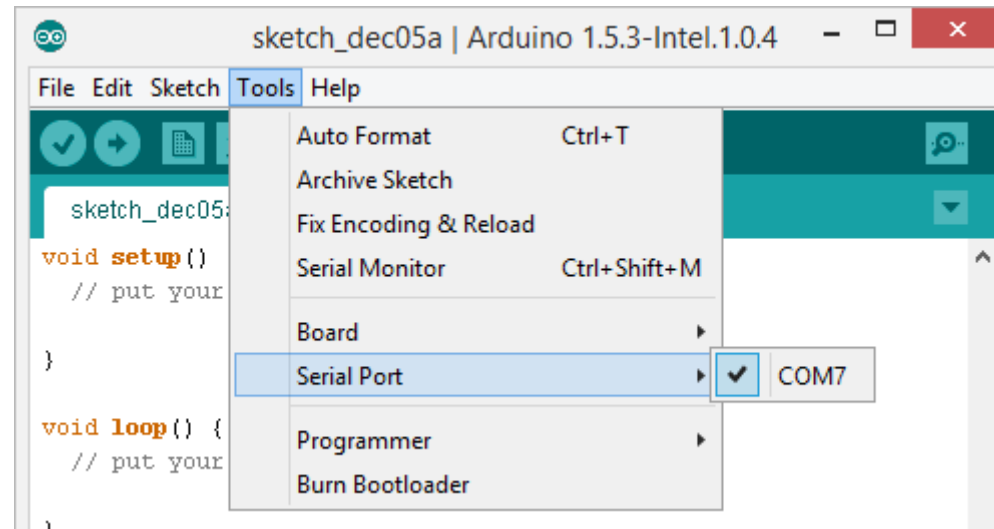
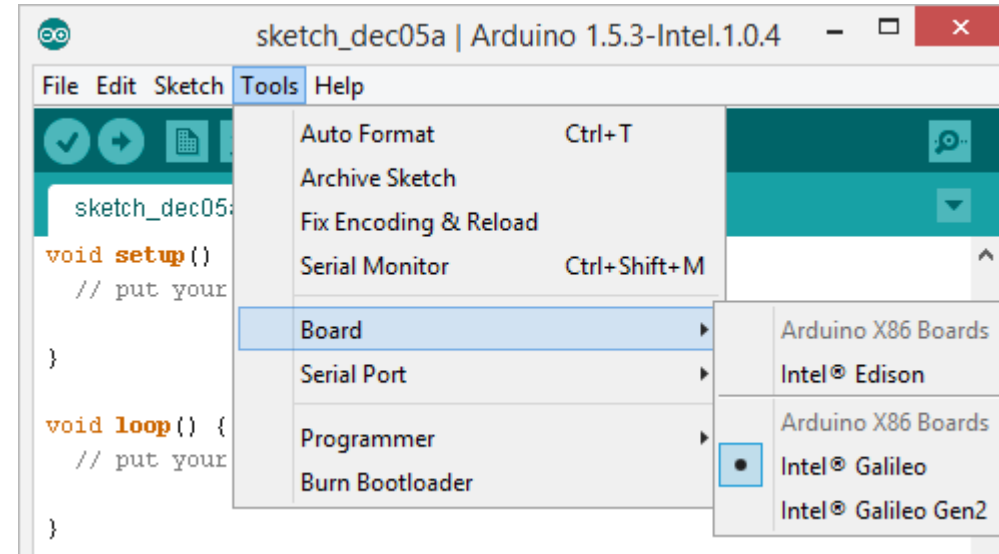


Open Arduino IDE



Verify

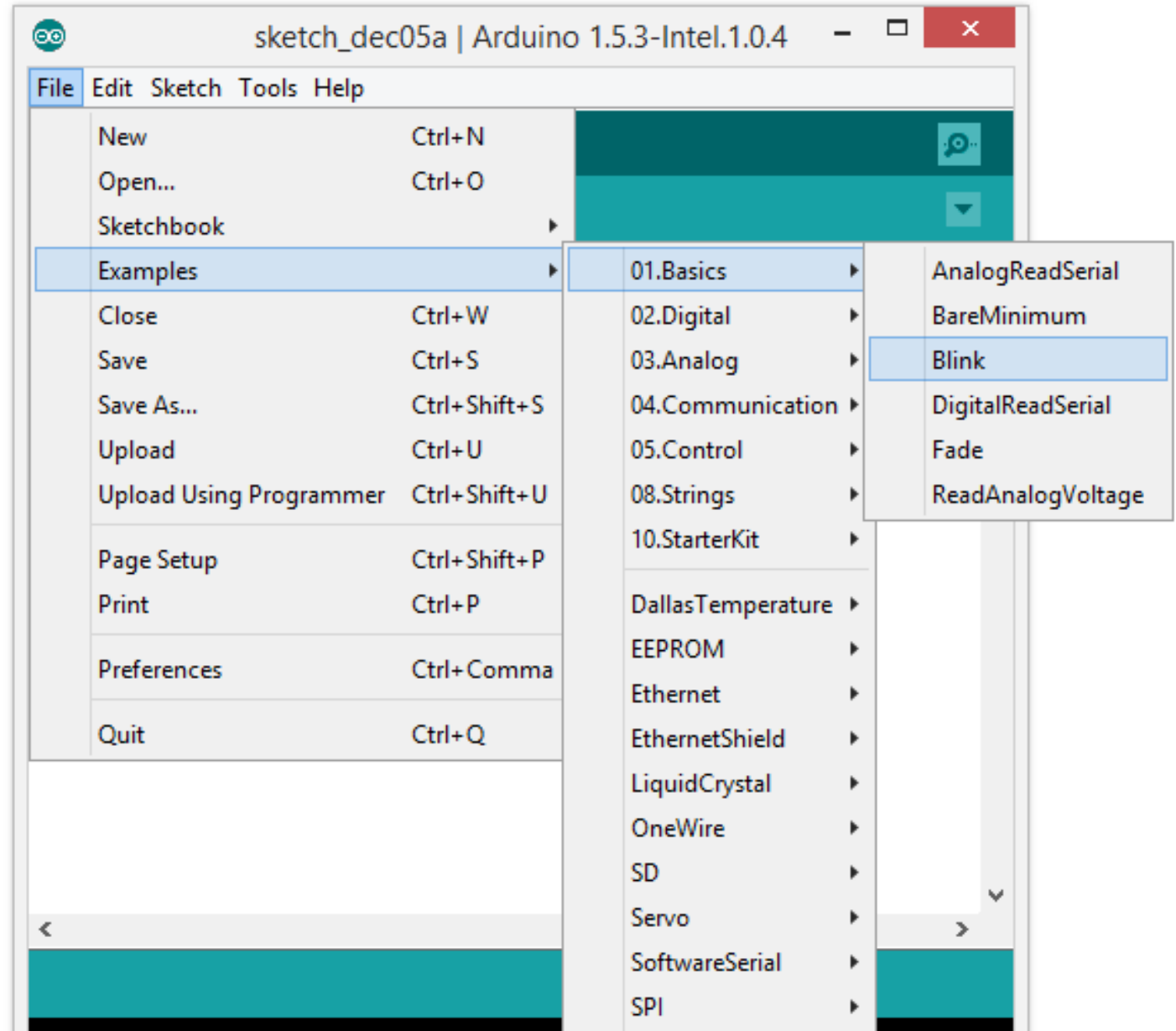
Choose correct Galileo board



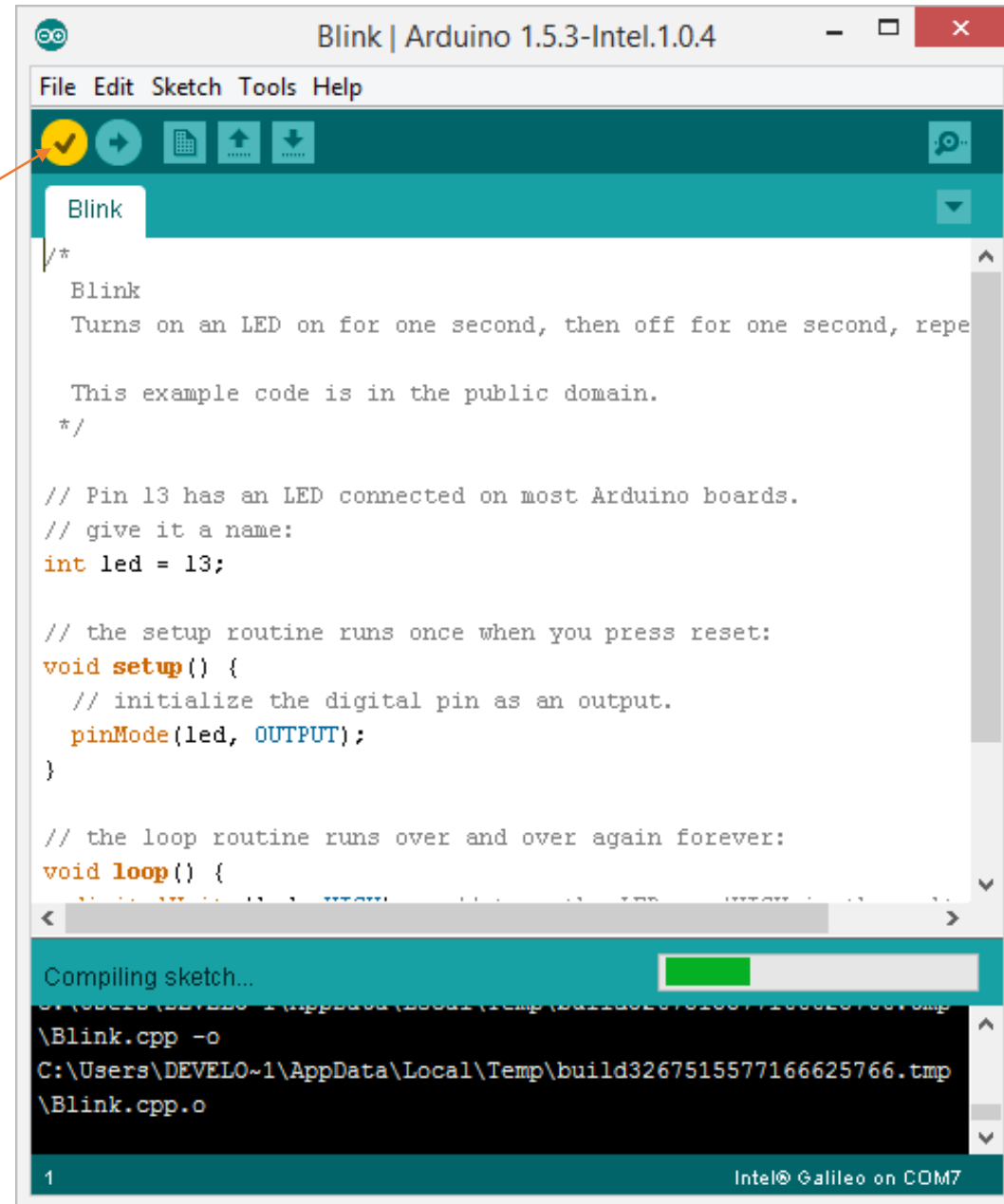
Make sure port number same with the one presented in Device Manager

Open Blink Example

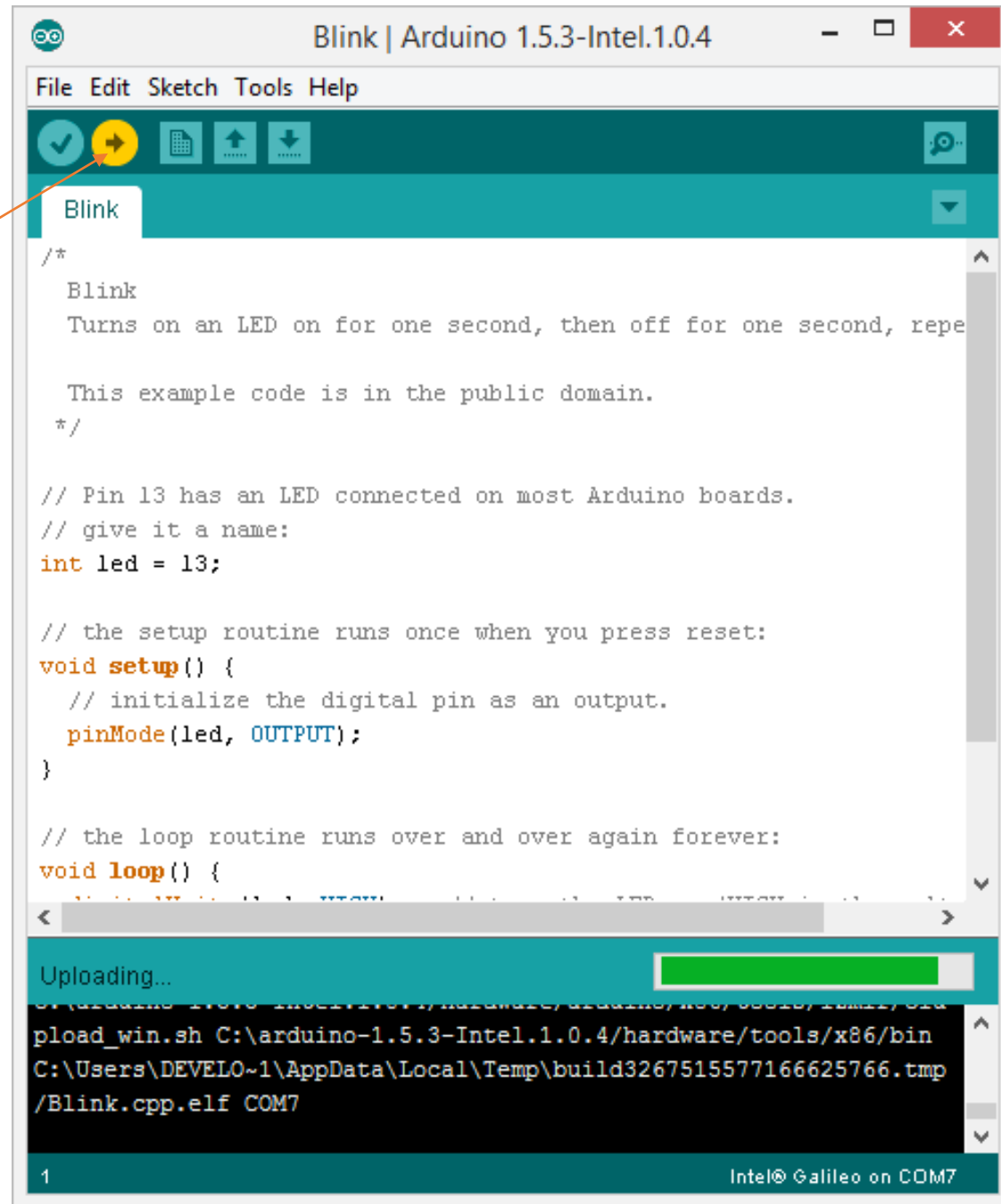
File > Examples > 01.Basic > Blink



Compile

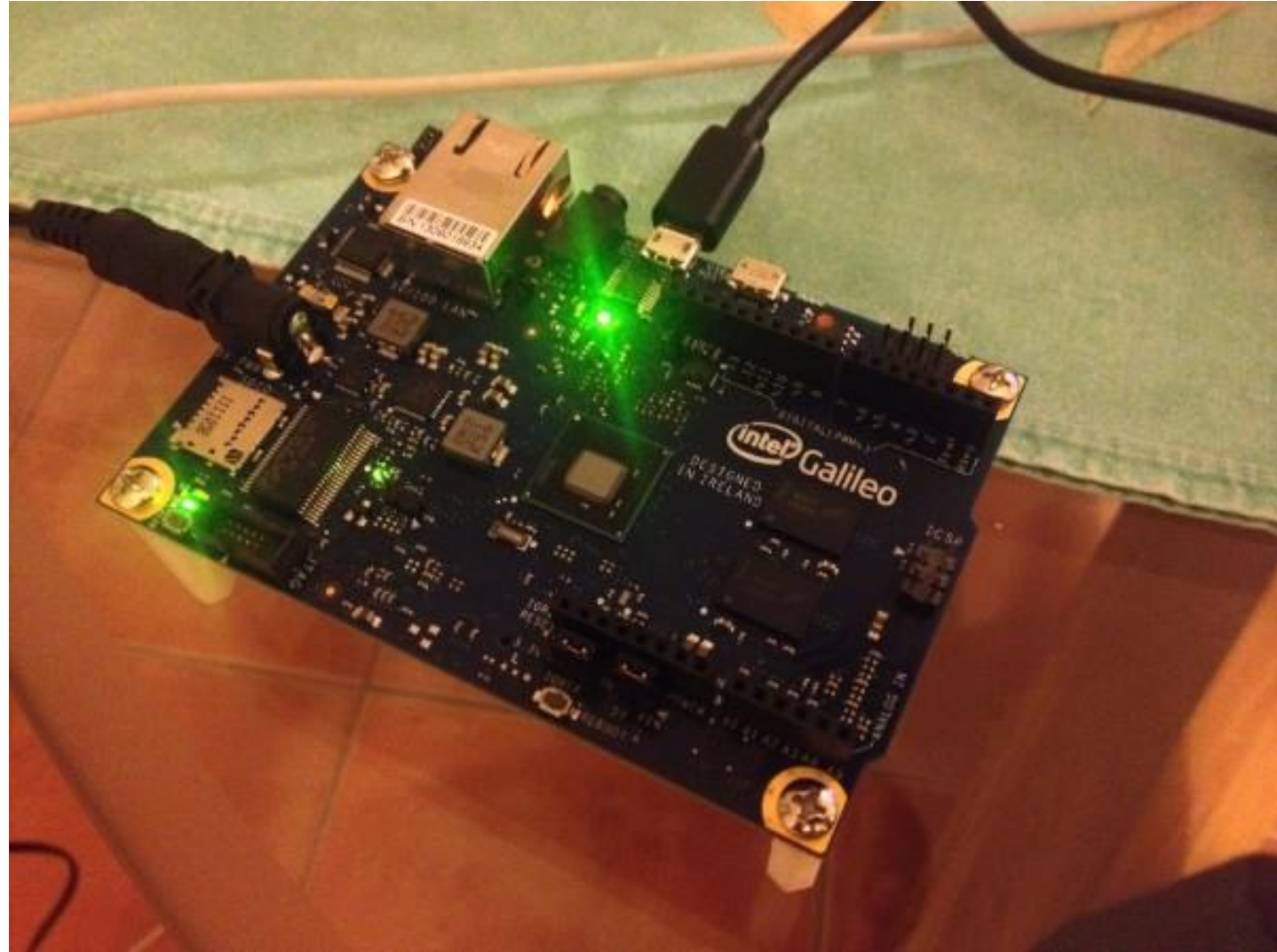


Upload



Observe

- LED blinks



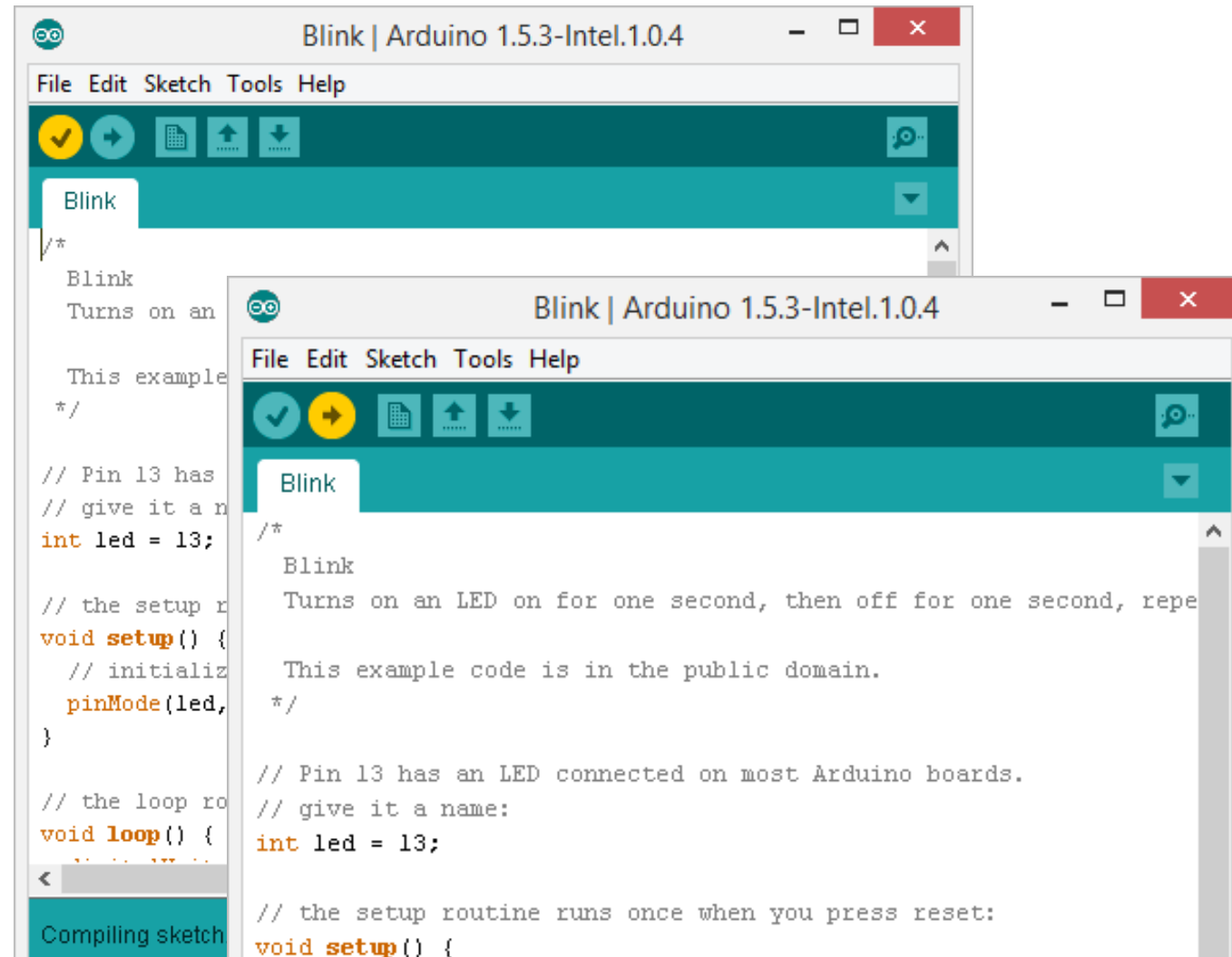
Serial Monitor

Print or display output of println, how to read Serial Monitor

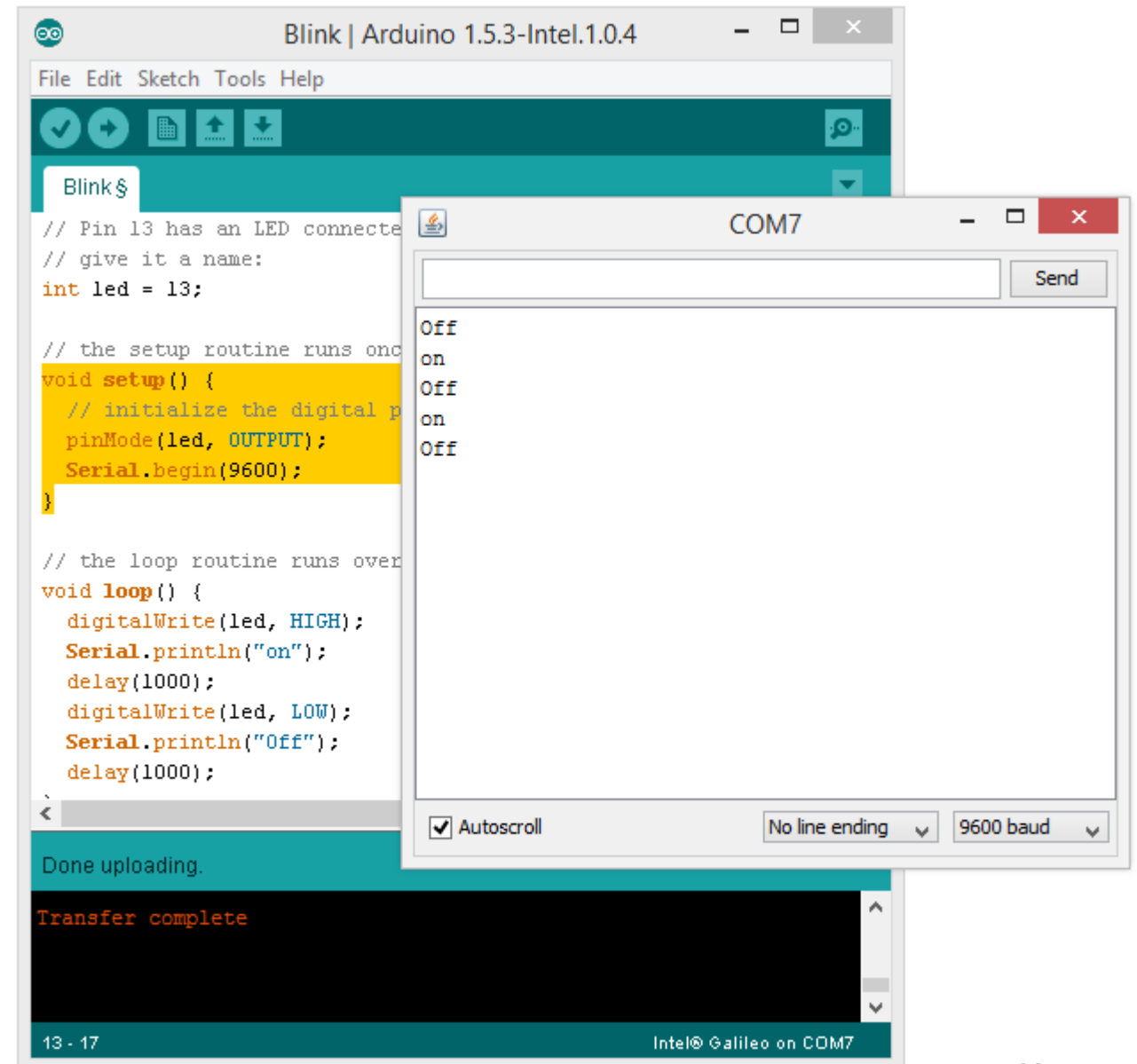
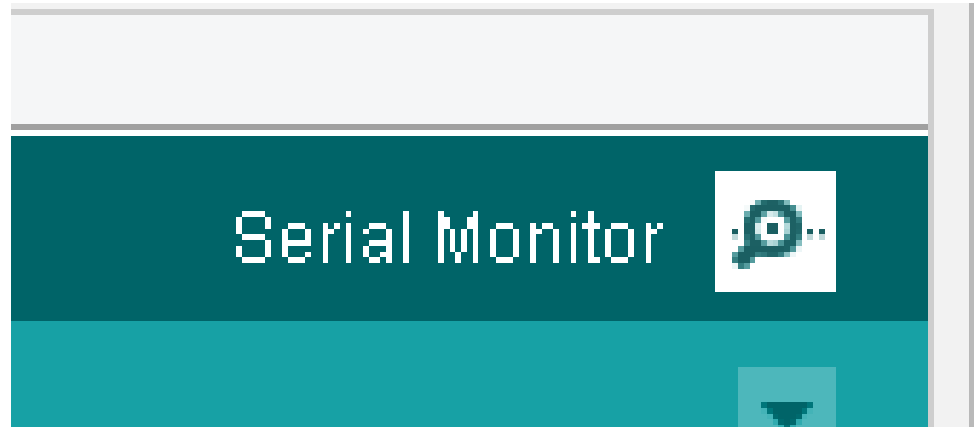
Add these **Serial** lines on the Sketch

```
void setup() {  
  // initialize the digital pin as an output.  
  pinMode(led, OUTPUT);  
  Serial.begin(9600);  
}  
  
void loop() {  
  digitalWrite(led, HIGH); // turn the LED on (HIGH is the voltage level)  
  Serial.println("On");  
  delay(1000);           // wait for a second  
  digitalWrite(led, LOW); // turn the LED off by making the voltage LOW  
  Serial.println("Off");  
  delay(1000);           // wait for a second  
}
```

Compile & Upload



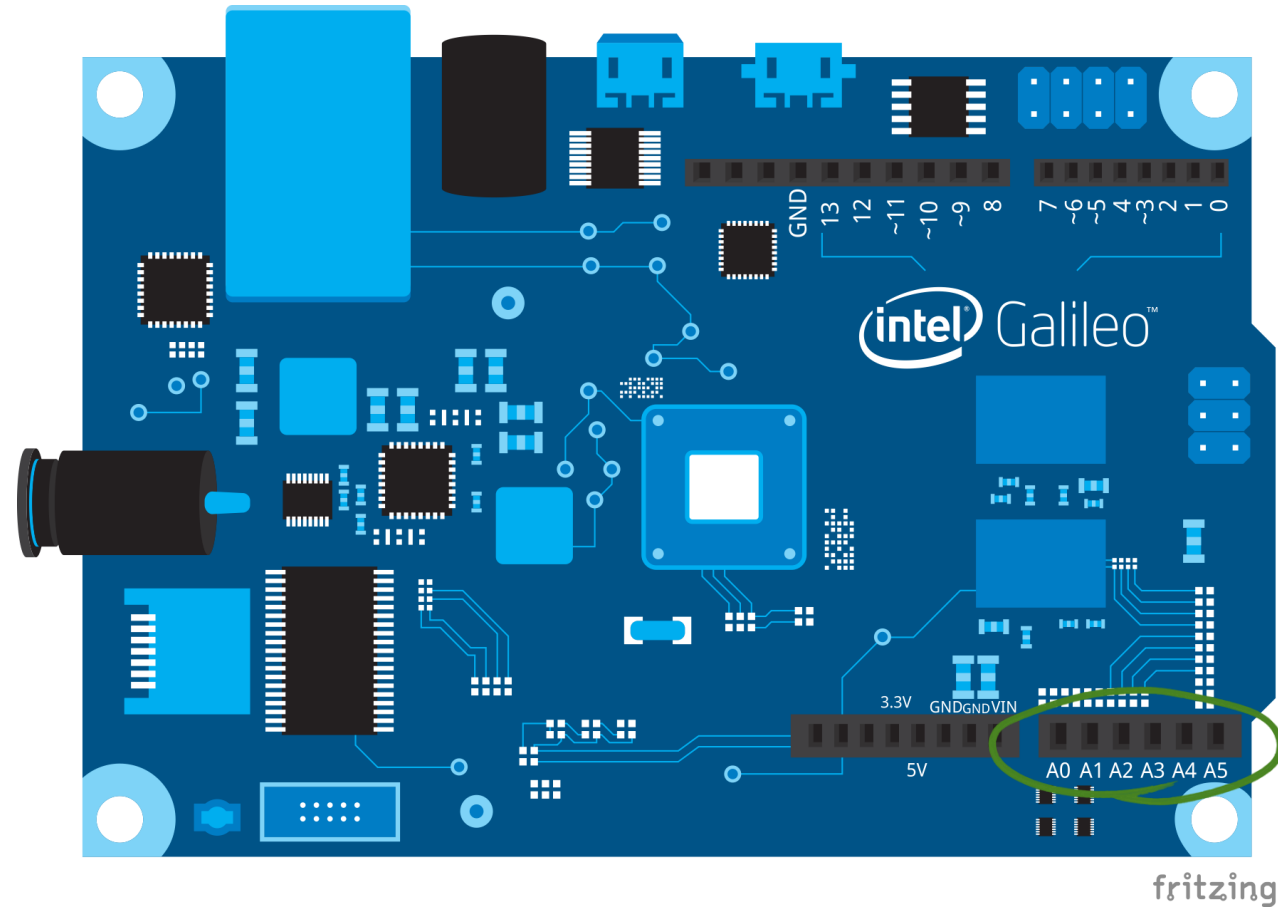
Open Serial Monitor



Sensor

Introduction to Input/Output, analog pins and Analog Temperature Sensor(Ic35)

Analog Pins



Analog Pins API

analogRead()

Description: read Read the value from specified analog pin

Syntax:

```
analogRead(pin);
```

Parameter:

pin: the pin of analog input (0 to 5)

Returns:

int (0 to 1023)

Scale:

0 to 1023 = 0V to 5V

Analog Pins API (cont.)

analogWrite() (PWM)

Description: Write the value to specified analog input

Syntax:

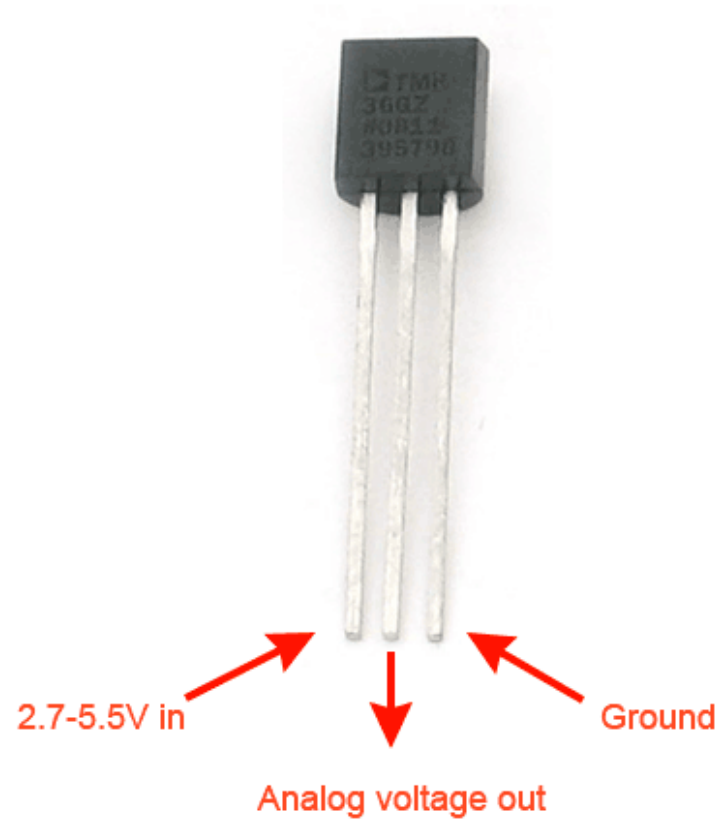
```
analogWrite(pin, value);
```

Parameter:

pin: the pin to write to

value: int (0 to 255)

Analog Temperature Sensor



Temperature Sensor Sketch

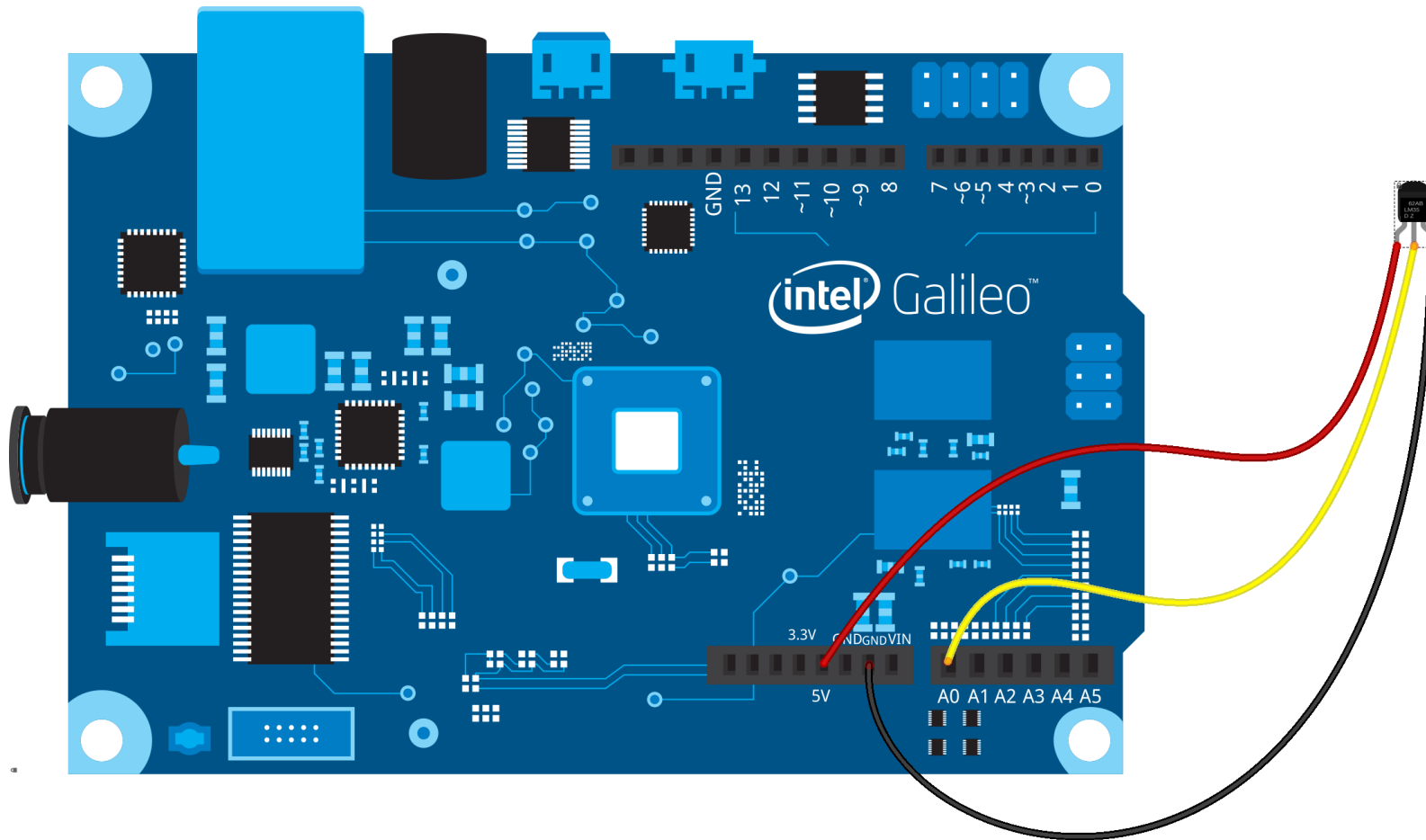
A screenshot of the Arduino IDE interface. The title bar shows 'sketch_dec05a | Arduino 1.5.3-Intel.1.0.4'. The menu bar includes 'File', 'Edit', 'Sketch', 'Tools', and 'Help'. Below the menu bar is a toolbar with icons for checking, running, saving, and uploading. A tab labeled 'sketch_dec05a' is active. The main text area contains the following C++ code:

```
// Analog Temperature Sensor
float temp;
int tempPin = 0;

void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);
}

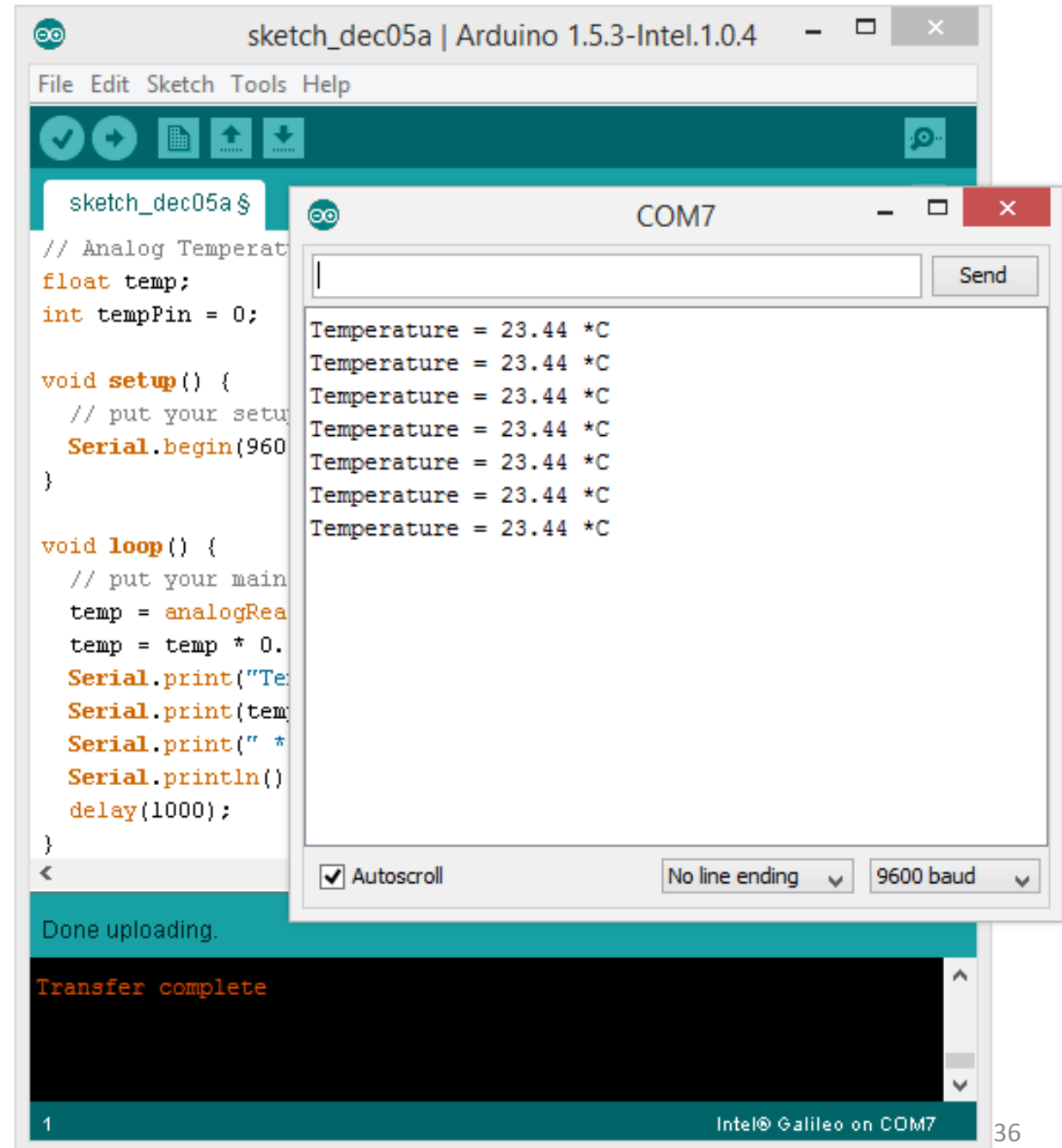
void loop() {
  // put your main code here, to run repeatedly:
  temp = analogRead(tempPin);
  temp = temp * 0.48826125;
  Serial.print("Temperature = ");
  Serial.print(temp);
  Serial.print(" *C");
  Serial.println();
  delay(1000);
}
```

Galileo with Im35(analog temperature sensor)



Observe

- Open Serial Monitor and observe the temperature value



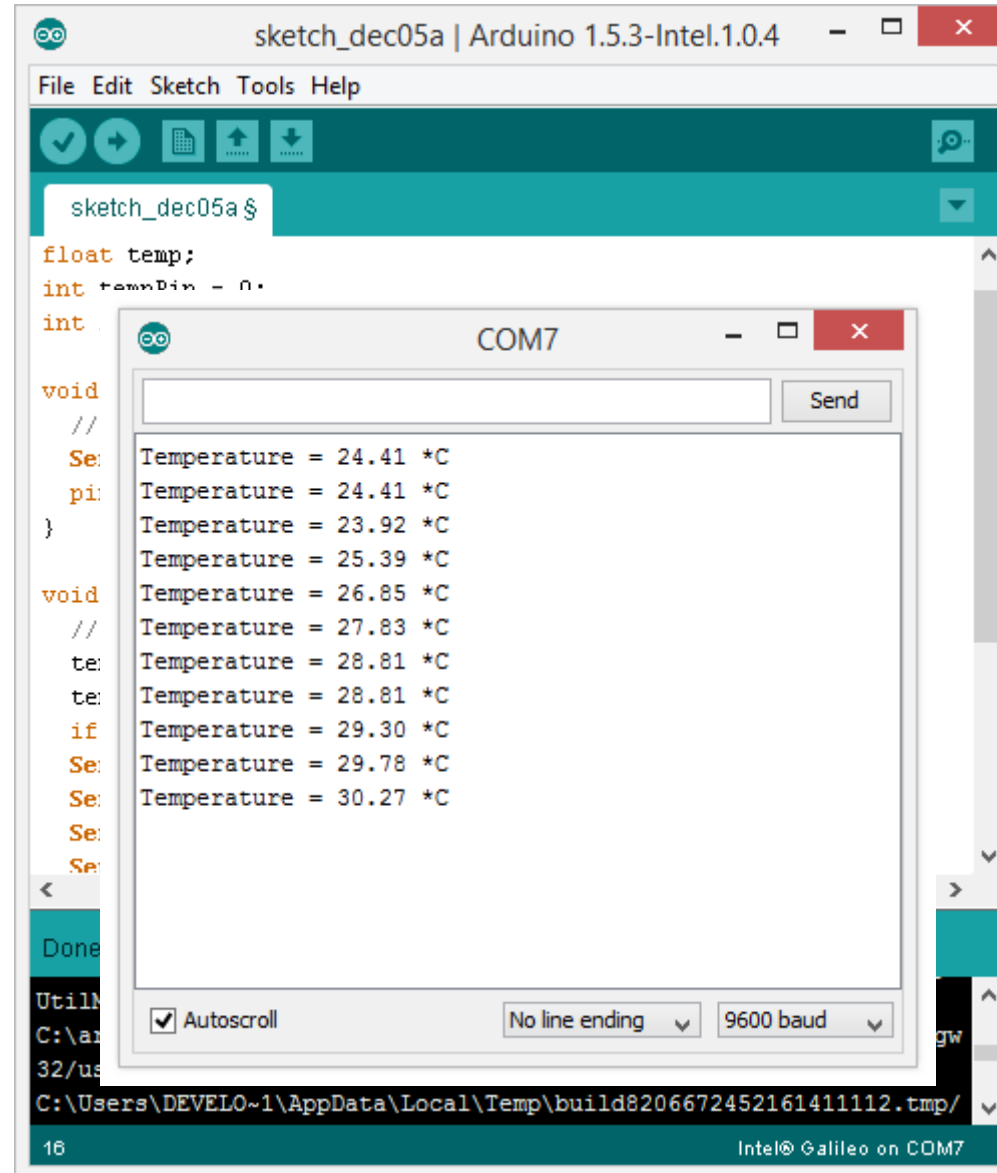
Assignment

- Use analog temperature sensor with Intel Galileo board. Blink built-in led (pin13) with normal temperature (with delay 1 second). If the temperature goes above 30°C blink it a little bit faster (with delay 500ms).



Assignment(cont.)

- Example output from Serial Monitor



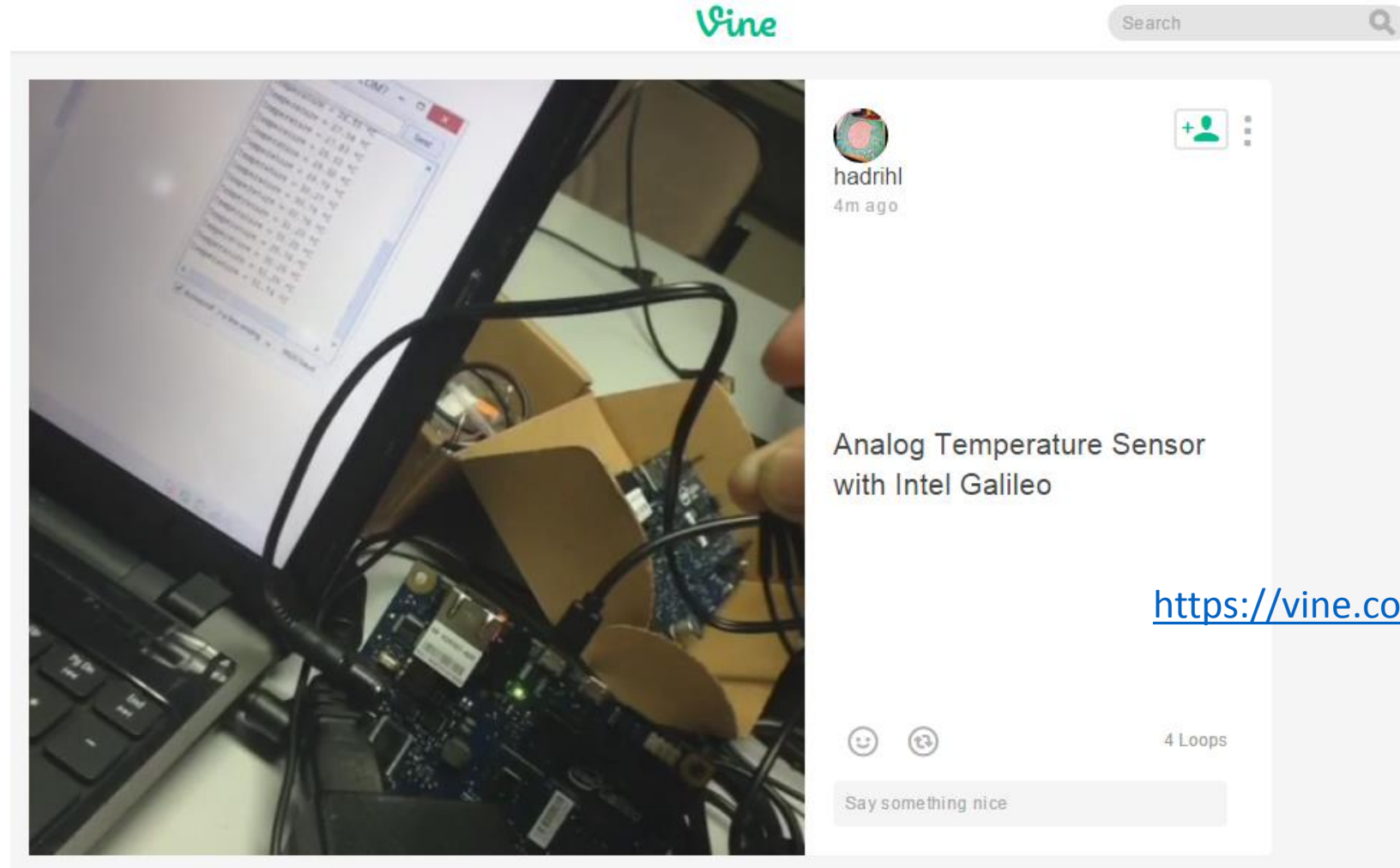
The screenshot shows the Arduino IDE interface. The main window displays a sketch named 'sketch_dec05a' with the following code:

```
float temp;
int tempPin = 0;
int ...

void
//
Se: Temperature = 24.41 *C
pi: Temperature = 24.41 *C
}
Temperature = 23.92 *C
Temperature = 25.39 *C
void
Temperature = 26.85 *C
//
Temperature = 27.83 *C
te: Temperature = 28.81 *C
te: Temperature = 28.81 *C
if
Temperature = 29.30 *C
Se: Temperature = 29.78 *C
Se: Temperature = 30.27 *C
Se:
Se:
```

A serial monitor window titled 'COM7' is overlaid on the sketch, displaying the same temperature readings. The monitor has a 'Send' button and a 'Done' button. At the bottom, it shows 'Autoscroll' checked, 'No line ending' selected, and '9600 baud' selected. The status bar at the bottom indicates 'Intel® Galileo on COM7'.

Assignment – Video



<https://vine.co/v/Ov2LAqBPjDT>

-end-

