Processing + Arduino

Introduction

Processing is an open source computer programming language and integrated development environment (IDE) built for the electronic arts, new media art, and visual design communities with the purpose of teaching the fundamentals of computer programming in a visual context, and to serve as the foundation for electronic sketchbooks.

The project was initiated in 2001 by Casey Reas and Benjamin Fry, both formerly of the Aesthetics and Computation Group at the MIT Media Lab. In 2012, they started the Processing Foundation along with Daniel Shiffman, who joined as a third project lead.

One of the aims of Processing is to allow non-programmers to start computer programming aided by visual feedback. The Processing language builds on the Java language, but uses a simplified syntax and a graphics user interface.

[Wikipedia]

Basics

Setup()

It is the part of program we place all the things necessary to get started. E.g. the size of the window we will be playing with, the styles of the graphics we want to see etc. Its syntax is as follow:

```
void setup()

{

        //Place your Code here!

}
```

Draw()

The part of program that needs to be repeated again and again is usually placed here. It's like the loop() of Arduino code. You place the necessary things and changes that updates with iteration. It's also like the setup function, except it's called again and again.

```
void draw()

{

        //Place the Iterative Code here!

}
```

//Some useful Functions

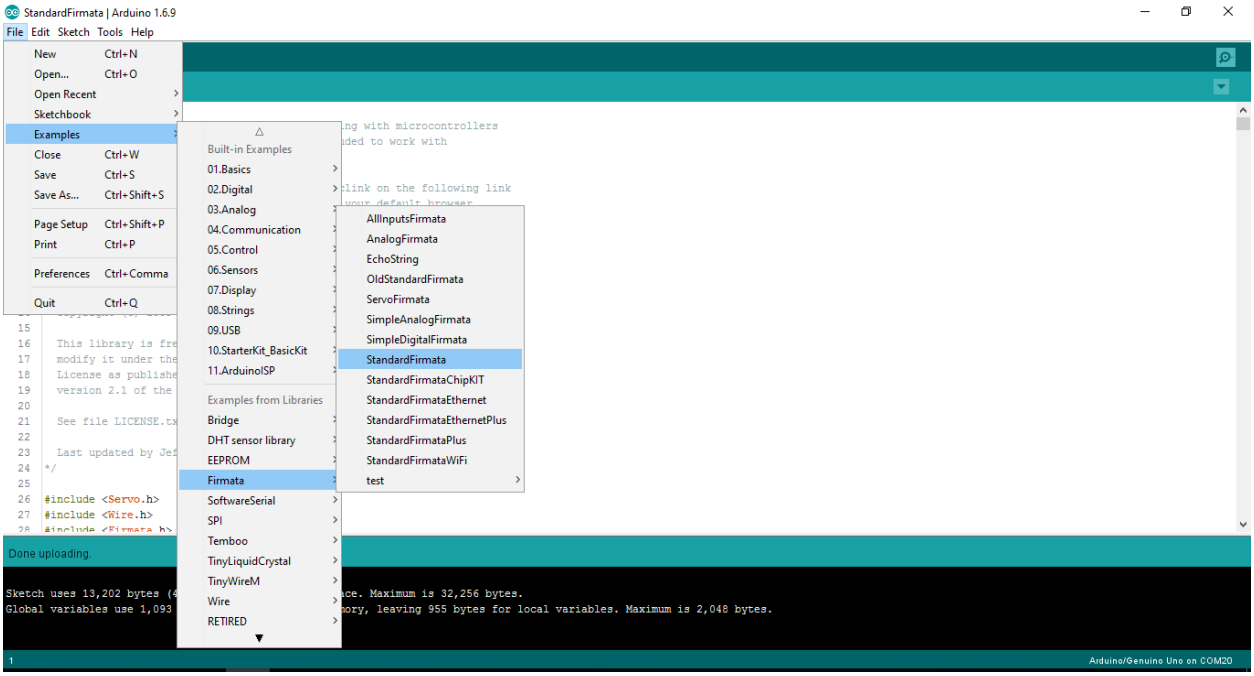
1. size(x,y): It tells us the size of console we are playing in, in terms of 'x' and 'y' coordinates.
2. line(x1,y1,x2,y2): The line between two coordinates.
3. translate(x,y): The object last treated is moved to new place for given values of 'x' and 'y'.

4. import processing.serial.*; // reference the serial library
5. import cc.arduino.*; // reference the Arduino library
6. Arduino arduino; // create a variable Arduino of the Arduino data type
7. println(Serial.list()); // List all the available serial ports:
8. arduino = new Arduino(this, Arduino.list()[0], 57600);

Integration with Arduino

To integrate Processing with Arduino, we need a special piece of code that tells/instructs computer to communicate between processing IDE and Arduino on serial port. We call it a protocol, and in this case it is Firmata (See http://www.firmata.org for more information). In our Arduino IDE, there is Firmata pre-installed, so we don't need something extra to do. Only thing that is necessary is to upload Standard Firmata to Arduino so that it can be controlled directly by Processing IDE. For this, open Arduino and go to:

File->Examples->Firmata->StandardFirmata

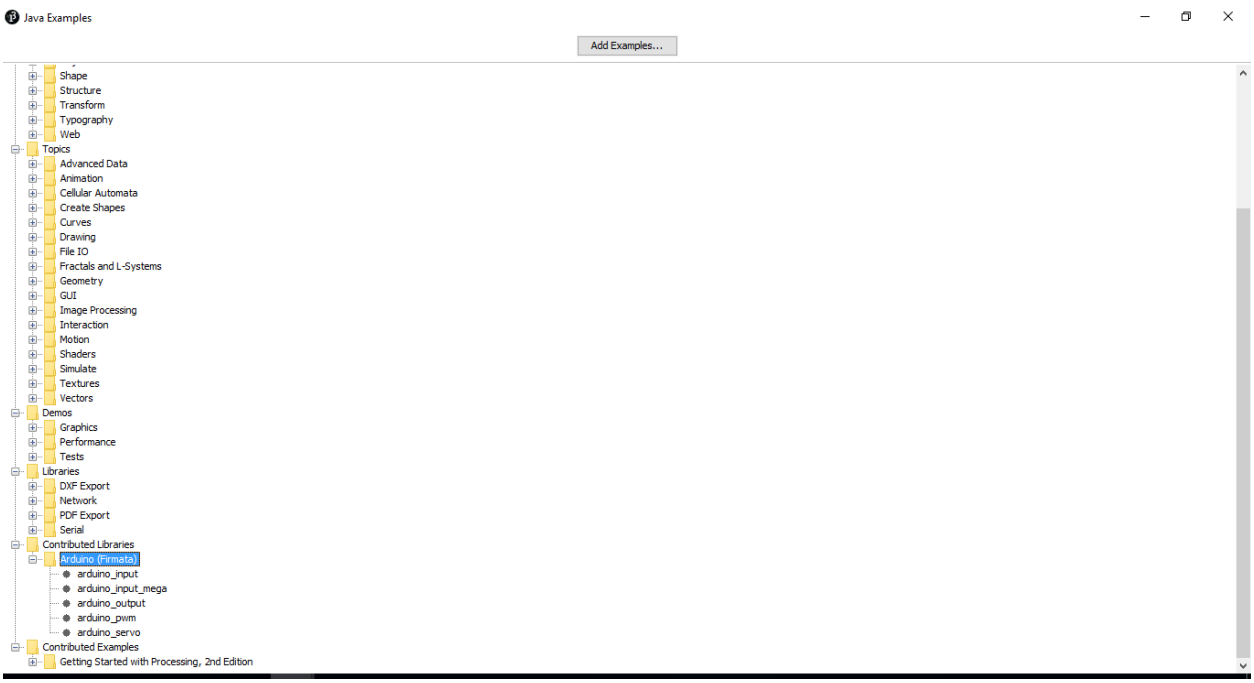


Now that you have uploaded Firmata to Arduino, it will understand the further communication process through Processing environment. Useful syntax given above gives detail of libraries needed to communicate between the two. Follow instructions given in the companion sketches to move further.

Tasks

After that you have developed a Firmata Protocol between Arduino and your Computer, you will need to understand the syntax used to speak to Arduino through processing environment. For this purpose, go to Processing bar menu and open following directory:

File->Examples->Contributed Libraries->Arduino (Firmata)



Now you will open examples to open for learning how to take input and how you can provide output to Arduino. For this time, we will do only input examples, named as Recursive Tree. Read the instructions given in comments, you will be able to follow further instructions. Once you are able to understand and practice given example code, you can write you own next time.

What would you like to do further, don't forget to suggest us for upcoming events. Keep Making!