BSC~ Microsoft Research Centre

Python for Engineers

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Agenda

- Importance of Programming Languages
- Python Language
- **Python for Engineers**
  - Interfacing with external world (etc)
  - RasppberyPi
- Python for Scientists
  - Data Analytic

RasppberyPi

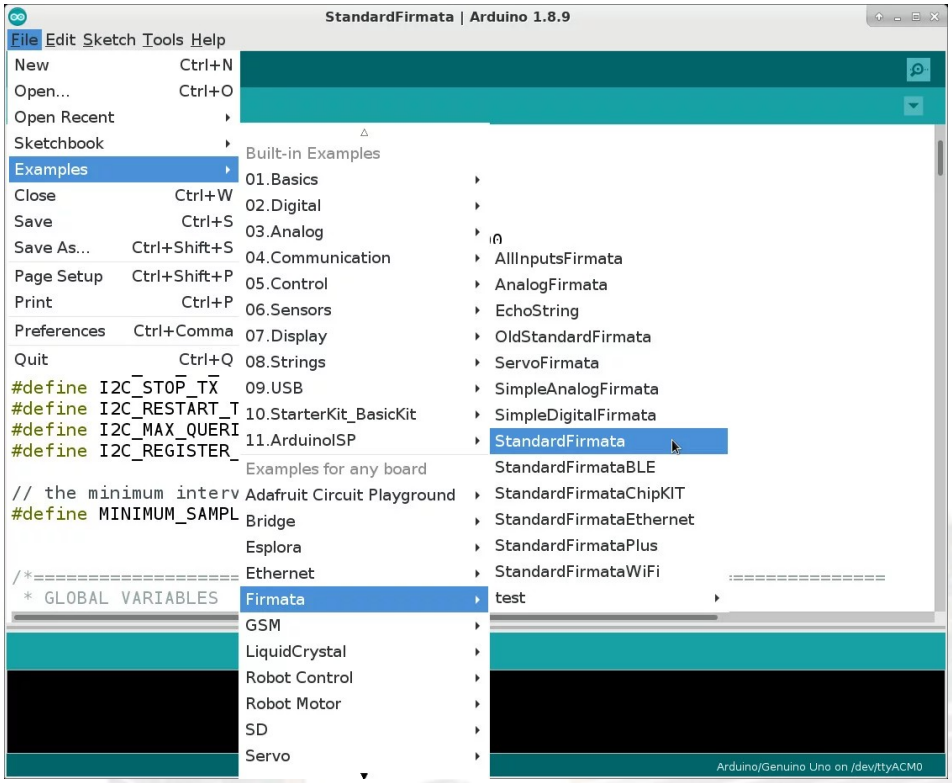
Make a HTTP Server

- python -m SimpleHTTPServer

Programming Arduino

- pip install pyfirmata

```
import pyfirmata
import time
board = pyfirmata.Arduino('/dev/ttyACM0')
while True:
    board.digital[13].write(1)
    time.sleep(1)
    board.digital[13].write(0)
    time.sleep(1)
```



Serial Communication

```
import serial
import syslog
import time
#The following line is for serial over GPIO
port = '/dev/ttyS0'
ard = serial.Serial(port,9600,timeout=5)
```

Audio Processing

```
import soundcard as sc
import matplotlib.pyplot as plt
import numpy as np
import os
import time
from IPython import display
import pandas
import scipy.fftpack
from numpy import genfromtxt

#set soundcard
# get a list of all speakers:
speakers = sc.all_speakers()
# get the current default speaker on your system:
default_speaker = sc.default_speaker()
# get a list of all microphones:
mics = sc.all_microphones()
# get the current default microphone on your system:
default_mic = sc.default_microphone()
#read data from sound card
# record and play back one second of audio:
data = default_mic.record(samplerate=48000, numframes=48000)
default_speaker.play(data/np.max(data), samplerate=48000)
```