

Embedded Systems Development using the Arduino Platform

Jeroen Doggen

jeroen.doggen@ap.be

AP Hogeschool Antwerpen

January 7, 2014



ARTESIS PLANTIJN
HOGESCHOOL ANTWERPEN

Outline

Arduino Hands-on

Arduino Hands-on

- ▶ Writing a Library for Arduino¹
- ▶ Use a good code editor with syntax highlighting (e.g. bluefish², Notepad++³).
- ▶ Follow me and test the code on your own PC & Arduino board as we go through the tutorial together.

¹<http://arduino.cc/en/Hacking/LibraryTutorial>

²<http://bluefish.openoffice.nl>

³<http://notepad-plus-plus.org>

Morse code: Sending “SOS” signal

- ▶ Without software library:
 - ▶ Complicated code
 - ▶ Verbose code

```
int pin = 13;

void setup()
{
  pinMode(pin, OUTPUT);
}

void loop()
{
  dot(); dot(); dot();
  dash(); dash(); dash();
  dot(); dot(); dot();
  delay(3000);
}

void dot()
{
  digitalWrite(pin, HIGH);
  delay(250);
  digitalWrite(pin, LOW);
  delay(250);
}

void dash()
{
  digitalWrite(pin, HIGH);
  delay(1000);
  digitalWrite(pin, LOW);
  delay(250);
}
```

Morse code: Morse.h

- Morse class
- More structure

```
#ifndef Morse_h
#define Morse_h

#include "Arduino.h"

class Morse
{
public:
    Morse(int pin);
    void dot();
    void dash();
private:
    int _pin;
};

#endif
```

Morse code: Morse.cpp

- Implementation
- Low level code

```
#include "Morse.h"

Morse::Morse(int pin)
{
    pinMode(pin, OUTPUT);
    _pin = pin;
}

void Morse::dot()
{
    digitalWrite(_pin, HIGH);
    delay(250);
    digitalWrite(_pin, LOW);
    delay(250);
}

void Morse::dash()
{
    digitalWrite(_pin, HIGH);
    delay(1000);
    digitalWrite(_pin, LOW);
    delay(250);
}
```

Morse code: Morse.ino

- ▶ Better code:
 - ▶ More structure
 - ▶ Easy to understand
 - ▶ Implementation hidden

```
#include <Morse.h>

Morse morse(13);

void setup()
{
}

void loop()
{
  morse.dot(); morse.dot(); morse.dot();
  morse.dash(); morse.dash(); morse.dash();
  morse.dot(); morse.dot(); morse.dot();
  delay(3000);
}
```

Morse code: Morse.ino (version 2)

- New functions:
 - Send letter “s”
 - Send letter “o”

```
#include <Morse.h>

Morse morse(13);

void setup()
{
}

void loop()
{
  morse.letter_s();
  morse.letter_o();
  morse.letter_s();
  delay(3000);
}
```


Morse code: Morse.ino (version 3)

- ▶ New functions:
 - ▶ Send “SOS”

```
#include <Morse.h>

Morse morse(13);

void setup()
{
}

void loop()
{
  morse.sos();
  delay(3000);
}
```

Thank you for your attention!

