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ArduinolDE

arduino, iot, development

ArduinolDE portable

- Download the distribution from the official webpage:

```
wget https://downloads.arduino.cc/arduino-1.8.13-linux64.tar.xz
tar xvf arduino-1.8.13-linux64.tar.xz
```

- Inside arduino-1.8.13/, create a directory named portable

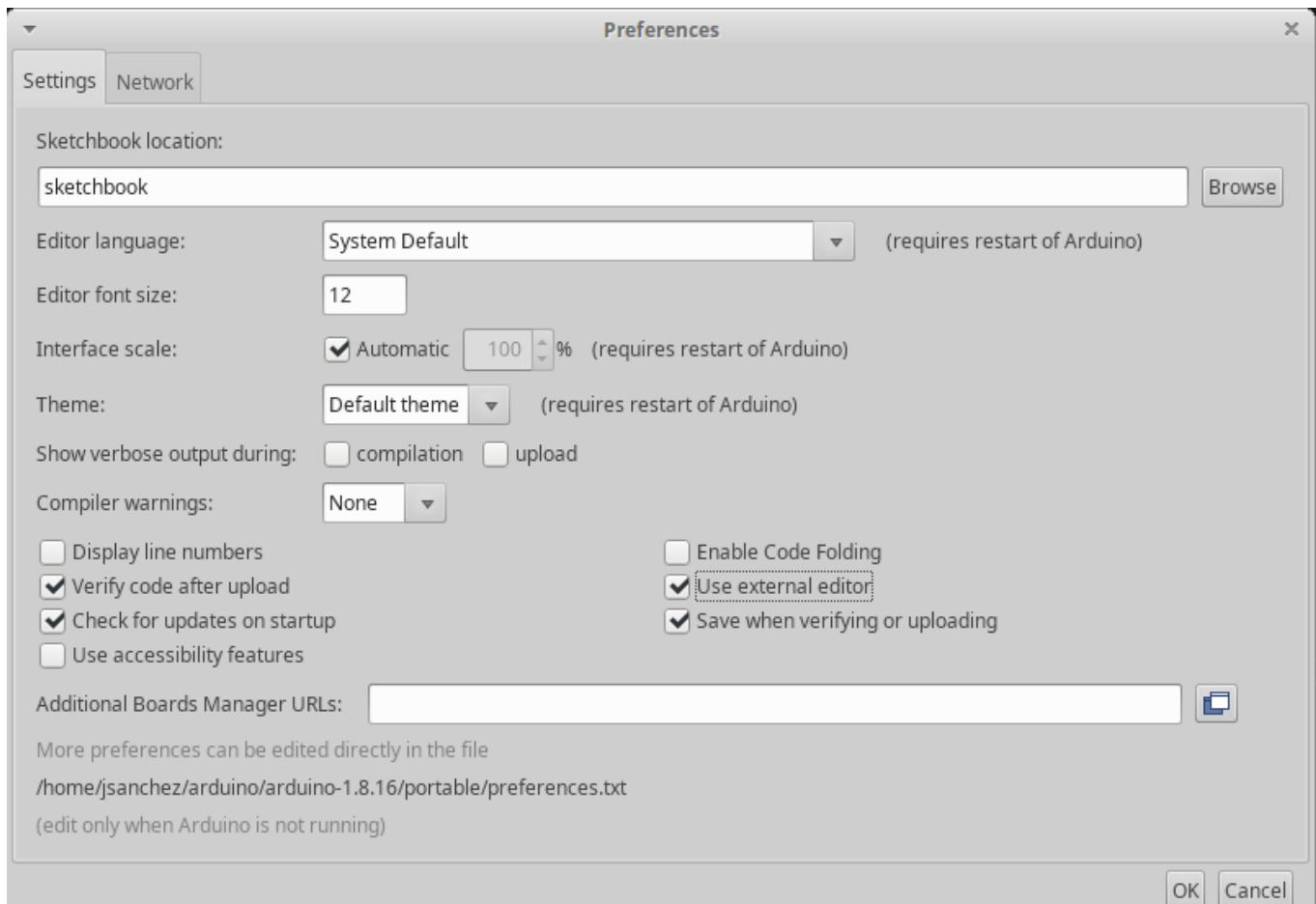
```
cd arduino-1.8.13/
mkdir portable
```

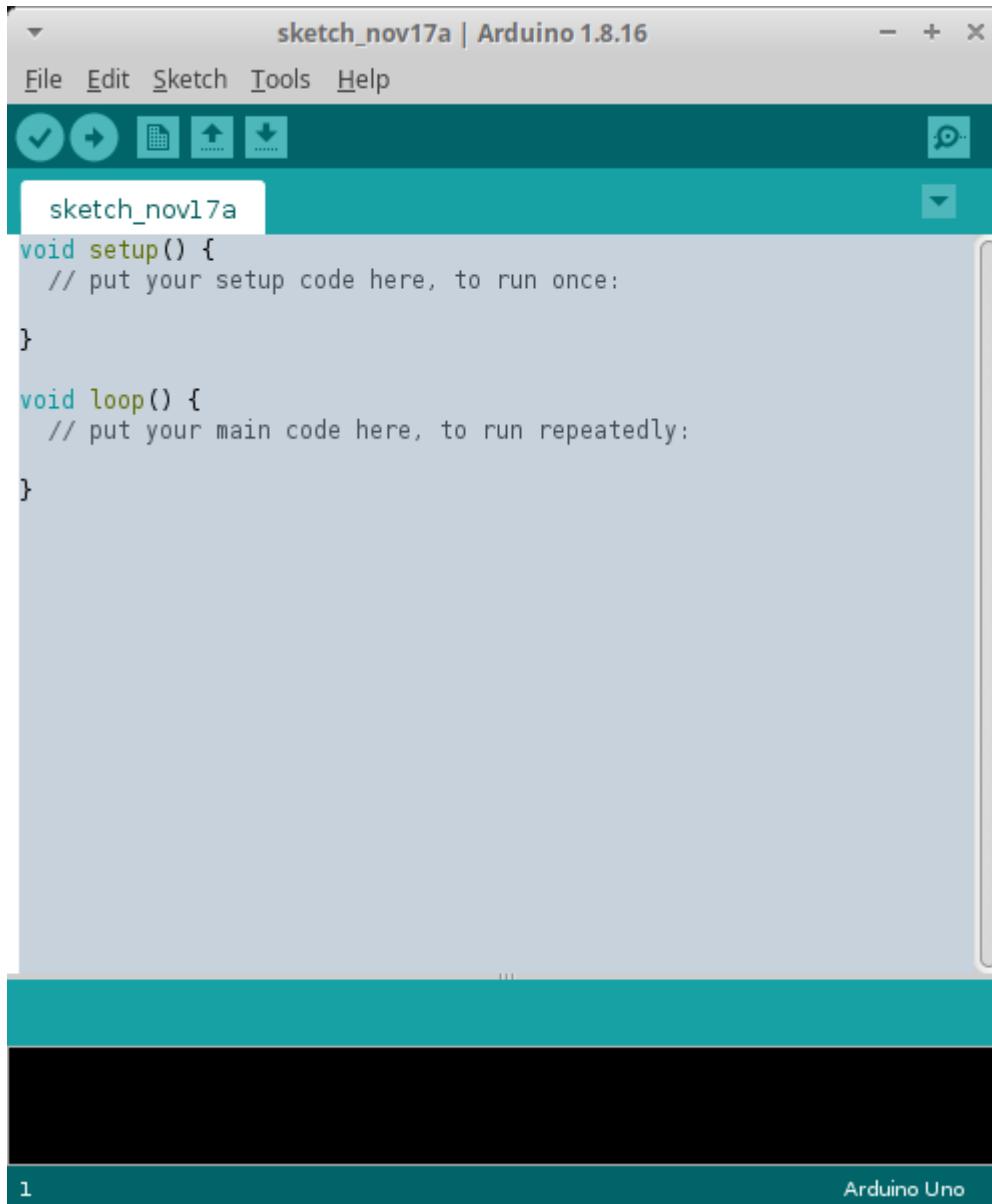
- By merely existing, this portable directory modifies the base behaviour of the ArduinolDE environment. From now on, all the libraries, compilers, utilities, and configuration files are always contained within the portable folder.

```
cd arduino-1.8.13/
./arduino
```

ArduinolDE with external Editor

- Go to settings and mark the Use External Editor option.
- Now you can edit the sketch files with your favourite editor and save.
- When you're done with editing, use ArduinolDE Upload and Serial Console normally.





ArduinolDE terminal compile and program board

- You can compile and program the board using ArduinolDE from the terminal:

```
./arduino
--port /dev/ttyUSB0
--board Arrow:samd:SmartEverything_Fox_native
--preserve-temp-files --pref build.path=/home/jsanchez/tmp/arduinoBuild
--verify || OR || --upload
./MYSKETCH.ino
```

- --port must be set to your serial device port.
- --board must be set to your board model (more on this next).
- --preserve-temp-files tells the compiler to build only the updated files instead of all the

code.

- This is a HUGE time saver!.
- Must specify with --pref build.path the directory to contain all the temporary object files.
This directory can be safely be deleted later.
- --verify only compiles the code without uploading it to the board (nice for debugging).
- --upload compiles and uploads the code to the board.

Don't forget the ./ in front of your sketch name!!

Finding the board name

```
./arduino
--port /dev/ttyUSB0
--board Arrow:samd:SmartEverything_Fox_native
--preserve-temp-files --pref build.path=/home/jsanchez/tmp/arduinoBuild
--verify || OR || --upload
./MYSKETCH.ino
```

- --board must be set to your board model.
- You can find several boards.txt files in your source tree.

```
hardware/arduino/avr/boards.txt
portable/packages/Arrow/hardware/samd/2.1.0/boards.txt
portable/packages/arduino/hardware/samd/1.6.18/boards.txt
```

You can build the board following the dir names and within the boards.txt file itself:
`SmartEverything_Fox_native.name=SmartEverything Fox (Native USB Port)`

ArduinolDE modular code

- Besides your .ino file, you can place additional source files within your sketch folder.
- These will be compiled and linked implicitly by the ArduinolDE toolchain.
- However, don't forget to do apply the correct C/C++ modular code practices!! i.e. #include, extern, etc.
- Note how the files are listed as TABS in the ArduinolDE interface.

```
smelion_RN2483FirmwareUpdater - HexFileImage2483_103.h | Arduino 1.8.16
File Edit Sketch Tools Help
smelion_RN2483FirmwareUpdater HexFileImage.h HexFileImage2483_101.h HexFileImage2483_103.h HexFileImage2483_104.h
#ifndef HEXFILEIMAGE2483_H_
#define HEXFILEIMAGE2483_H_

#define HexFileImage RN2483_103
const char* const RN2483_103[] = {
    ":10030000D7EF01F0FFFFFF5A82FACF2AF0FBFB1",
    ":100310002BF0D9CF2CF0DACF2DF0F3CF2EF0F4CF95",
    ":100320002FF0F2BC9DA005D09EA003D021EC74F06C",
    ":1003300030D0F2BC9DAA05D09EAA03D017EC5DF088",
    ":1003400028D0F2BC9DA805D09EA803D0D9EC6FF0B0",
    ":1003500020D0F0B6F0A003D026EC75F01AD0F0B89B",
    ":10036000F0A203D023EC75F014D0F2B6F2A003D0C3",
    ":10037000F5EC73F00ED0F2BC9DA605D09EA603D07E",
    ":100380001BEC25F006D0F2BCA0A603D0A1B667EC0A",
    ":1003900075F02FC0F4FF2EC0F3FF2DC0DAFF2CC084",
    ":1003A000D9FF2BC0FBFF2AC0FAFF5A9211005BEF66",
    ":1003B0003EF002010CBFE3EF05F00001CA6BCB6B0E",
    ":1003C000CC6BCD6BCE6BD369D469D569D66902018C",
    ":1003D000CF6B0C51F10B04090C6FB8C2D7F00AA512",
    ":1003E00010D1350E1C25F66EF76AF80EF722F86A62",
    ":1003F000000EF8220800F5CFA8F079510001A825D9",
    ":10040000A96F000EA8BFFF0E02017A210001AA6F9A",
    ":10041000AB6BAC6B0C0ED890A937AA37AB37AC37A7",
    ":10042000E82EF9D7A9C064F0AAC065F0ABC066F0A9",
    ":10043000ACC067F07D0E686F696B6A6B6B6BF2EC3A",
    ":1004400059F064C071F065C072F066C073F067C0A7",
    ":1004500074F00201C05194EC68F0350E02012125C0",
    ":10046000F66EF76AF80EF722F86A000EF822080016",
    ":10047000F5CFA8F07B510001A825A96F000EA8BFFF9",
    ":10048000FF0E02017C210001AA6FAB6BAC6B0C0E5E",
    ":10049000D890A937AA37AB37AC37E82EF9D7A9C01F",
    ":1004A00064F0AAC065F0ABC066F0ACC067F07D0E2A",
    ":1004B000686F696B6A6B6B6BF2EC59F064C071F03A",
    ":1004C00065C072F066C073F067C074F00201C1517C",
    ":1004D00094EC68F00201C0513CEC56F00201C151AD",
    ":1004E0003CEC56F0A6C0A8F0A7C0A9F00201B95193",
    ":1004F0000001AA6F0201BA510001AB6FAC6BAD6B8A",
    ":10050000D60F1A03F3CEAEF0E1CEAEFF0B06BB16B61"
```

```
[puesto8:smelion_RN2483FirmwareUpdater] jsanchez git:(8236dc4) ✘
$ ll
.rw-rw-r-- 828 jsanchez jsanchez 2021-07-08 12:50 HexFileImage.h
.rw-rw-r-- 206k jsanchez jsanchez 2021-07-08 12:50 HexFileImage2483_101.h
.rw-rw-r-- 190k jsanchez jsanchez 2021-07-08 12:50 HexFileImage2483_103.h
.rw-rw-r-- 190k jsanchez jsanchez 2021-07-08 12:50 HexFileImage2483_106_RC3.h
.rw-rw-r-- 190k jsanchez jsanchez 2021-07-08 12:50 HexFileImage2903_098.h
.rw-rw-r-- 206k jsanchez jsanchez 2021-07-08 12:50 HexFileImage2903AU_097rc7.h
.rw-rw-r-- 9,3k jsanchez jsanchez 2021-07-08 12:50 IntelHexParser.cpp
.rw-rw-r-- 1,5k jsanchez jsanchez 2021-07-08 12:50 IntelHexParser.h
.rw-rw-r-- 11k jsanchez jsanchez 2021-09-05 17:07 Readme.md
.rw-rw-r-- 7,8k jsanchez jsanchez 2021-07-08 12:50 RN2483Bootloader.cpp
.rw-rw-r-- 2,9k jsanchez jsanchez 2021-07-08 12:50 RN2483Bootloader.h
.rw-rw-r-- 8,5k jsanchez jsanchez 2021-09-05 17:07 smelion_RN2483FirmwareUpdater.ino
.rw-rw-r-- 5,2k jsanchez jsanchez 2021-07-08 12:50 Sodaq_wdt.cpp
.rw-rw-r-- 1,8k jsanchez jsanchez 2021-07-08 12:50 Sodaq_wdt.h
.rw-rw-r-- 1,2k jsanchez jsanchez 2021-07-08 12:50 Utils.h
```

ArduinoIDE Debug PRINT

- Print function calls can be controlled across a whole .c file without rewriting code.
- This enables us to switch the debug PRINT on/off with a simple macro definition #define DEBUG.
- This is implemented in some way or another in different projects. It is a very widespread practice.
- Copy this block in your C file.

```
#ifdef DEBUG

#define PRINT(...) Serial.print(__VA_ARGS__)
#define PRINTLN(...) Serial.println(__VA_ARGS__)
#define PRINT_ARRAY(add, len) \
do { \
    int i; \
    for (i = 0 ; i < (len) ; i++) { \
        Serial.print((unsigned int)((uint8_t*)(add))[i], HEX); \
    } \
    Serial.println(); \
} while(0)

#else /* DEBUG */

#define PRINT(...)
#define PRINTLN(...)
#define PRINT_ARRAY(add, len)

#endif /* DEBUG */
```

- Then, write conditional print sentences as PRINT(var).
- Additionally, the PRINT_ARRAY(address, len) function simply prints in HEX an array passed

as an argument.

- **NOTE** to activate the conditional debut pring, `#define DEBUG` must be writen **before** the previous code block.
 - Alternatively, it can be defined with a compiler CFLAG environment variable.

Use example:

```
uint8_t foo[255];
int bar = 7;
...
PRINTLN(bar);
PRINT_ARRAY(foo, sizeof(foo))
// These prints only if the DEBUG macro was defined.
7
EE FF 01 25 ...
```

ArduinolDE alternative serial consoles

- ArduinolDE comes with an embedded serial console.
- Alternatively you can use a serial console like picocom, but you must set it to the right parameters.

picocom

```
-g "logs/serial_console_log.txt" # Save the console text in a log file
-r                               # NO-reset - avoid resetting the device
-b 115200                         # Baudrate - MUST MATCH ARDUINOIDE!
--omap crcrlf                      # Mapping of EOL characters
/dev/ttyACM0
```

- Exit Picocom with Ctrl+A, Ctrl+X.

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