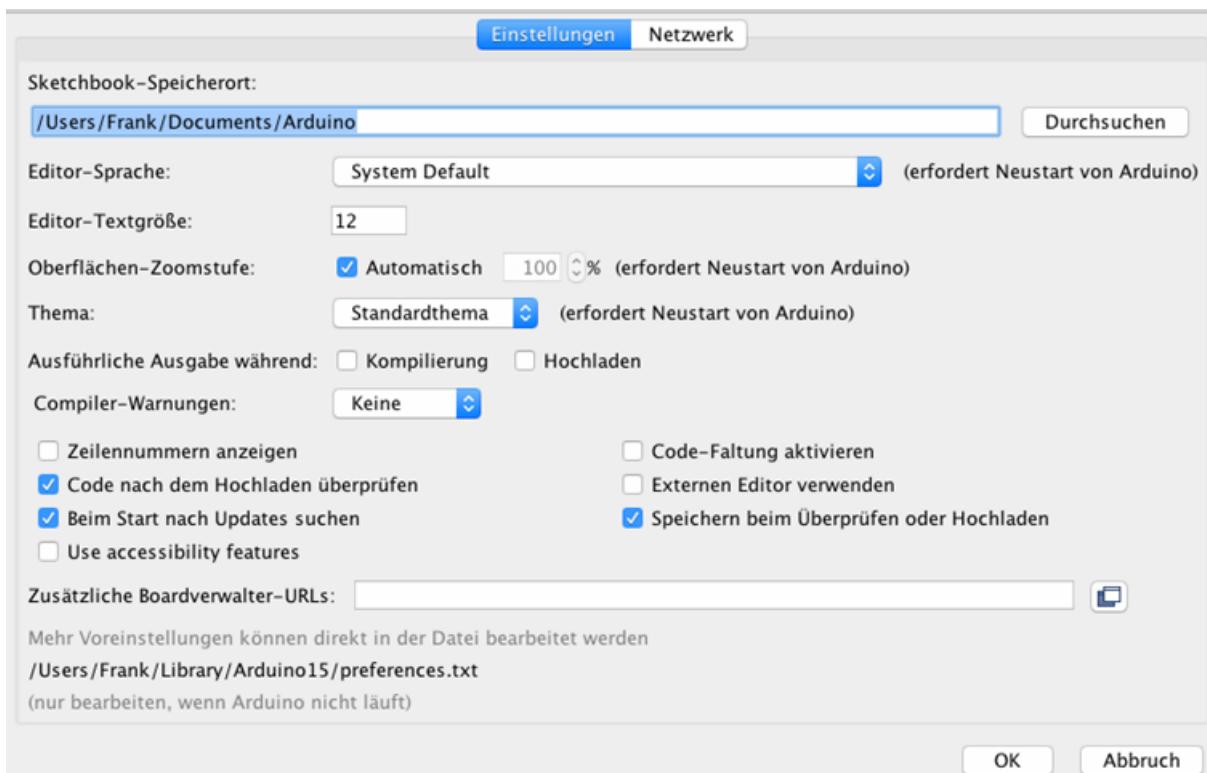


# Install ARDUINO for Mac

Download from <https://www.arduino.cc/en/software> the MAC OS X package.

The package will be downloaded to the downloads folder. You can move it to any folder on the Mac. Preferred Applications folder.

There is no installation necessary. The package can be used directly. You have to specify the location of the ARDUINO package later in the pyMobaledLib application.

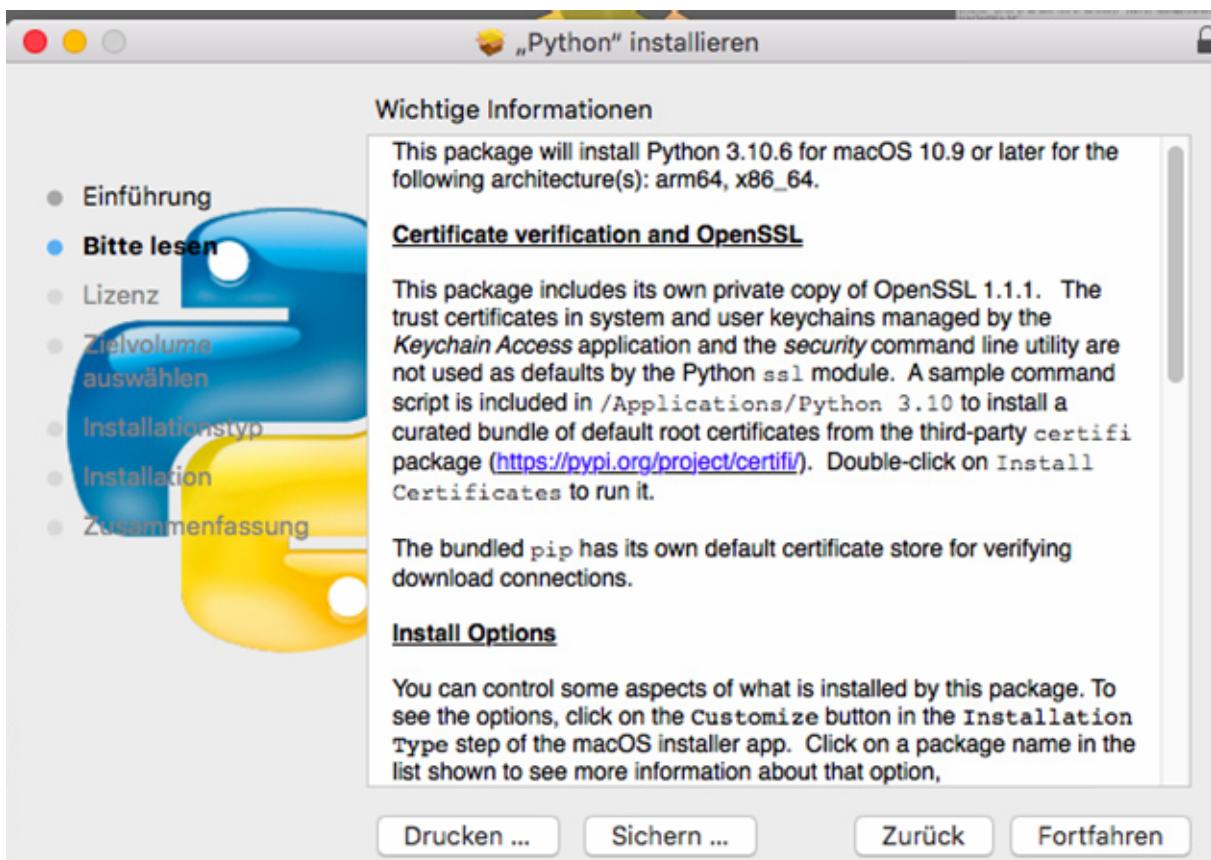
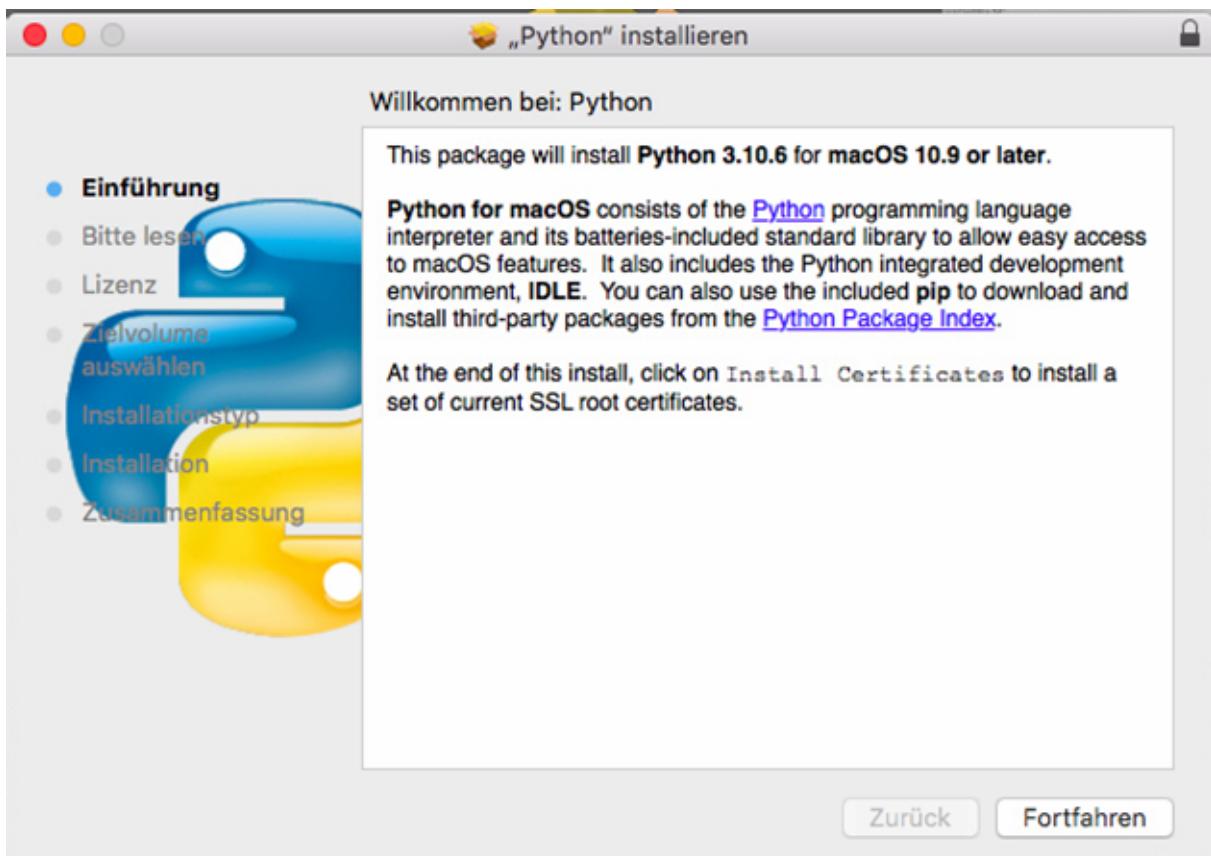


# Install Python 3

Download and install python 3 for mac. Use the latest version of the Mac OS 64-bit installer.

Help for the installation can be found here:  
<https://docs.python.org/3/using/mac.html>





### Using IDLE or other Tk applications

This package includes its own private version of Tcl/Tk 8.6. It does not use any system-supplied or third-party supplied versions of Tcl/Tk.

Due to new security checks on macOS 10.15 Catalina, when launching IDLE macOS may open a window with a message "**Python" would like to access files in your Documents folder**". This is normal as IDLE uses your **Documents** folder as its default when opening and saving files; you can still choose other locations in the **Open** and **Save** file dialog windows. Click on the **OK** button to proceed.

### macOS 11 (Big Sur) and Apple Silicon Mac support

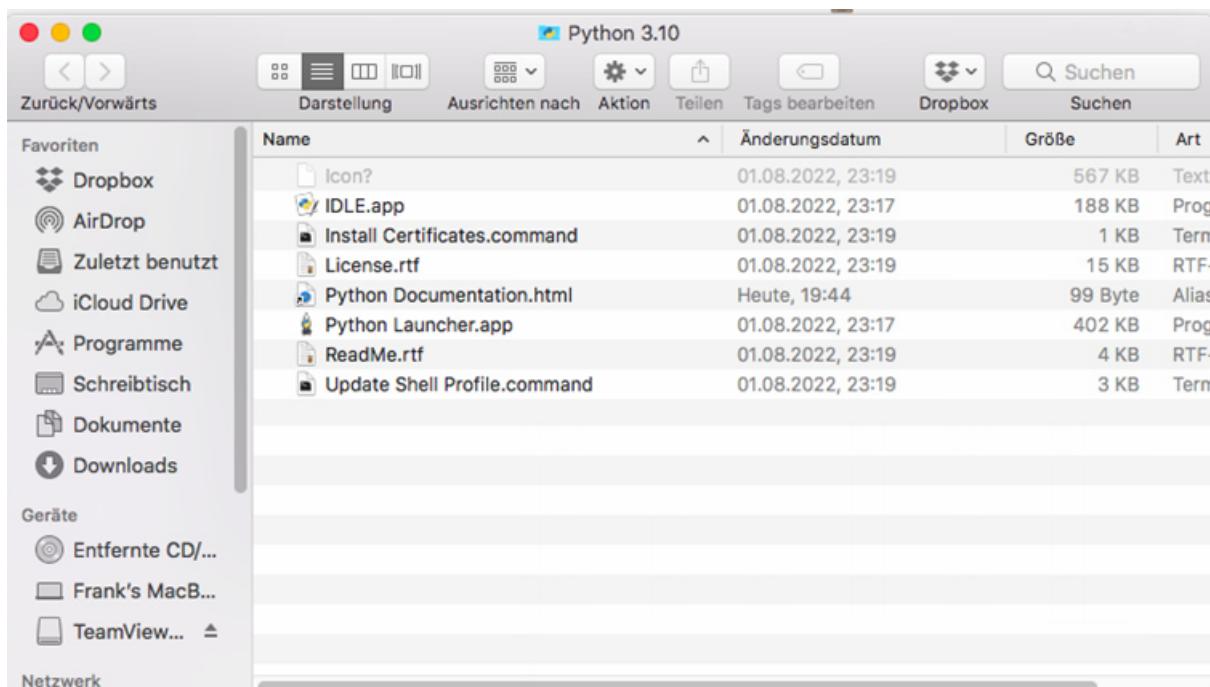
For Python 3.10 releases, we provide a new `universal2` installer variant that provides universal binaries for both ARM64 and Intel 64 architectures and is also supported on all Macs that support macOS 10.9 or later. Some of the advantages of the new installer variant: native ARM64 code on Apple Silicon Macs should run significantly faster than Rosetta2-emulated code; some operating system functions and options introduced in macOS releases since 10.9 are now exposed when available (primarily in the `os` module); and the new installer variant includes Tcl/Tk 8.6.11 rather than 8.6.8.

On Apple Silicon Macs, it is possible to run Python either with native ARM64 code or under Intel 64 emulation using Rosetta2. This option might be useful for testing or if binary wheels are not yet available with native ARM64 binaries. To easily force Python to run in emulation mode, invoke it from a command line shell with the `python3-intel64` command instead of just `python3`.

### Other changes

For other changes in this release, see the *What's new* section in the [Documentation Set](#) for this release and its *Release Notes* link at <https://www.python.org/downloads/>.





```
Last login: Sun Aug 14 19:45:44 on ttys000
Franks-Air:~ Franks$ /Applications/Python\ 3.10/Install\ Certificates.command ; exit;
-- pip install --upgrade certifi
Requirement already satisfied: certifi in /Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages (2022.6.15)
-- removing any existing file or link
-- creating symlink to certifi certificate bundle
-- setting permissions
-- update complete
logout
Saving session...
...copying shared history...
...saving history...truncating history files...
...completed.
Deleting expired sessions...none found.

[Prozess beendet]
```

To be able to run pyMobaedLib, we did to install the module keyboard.

Unfortunately, the standard python installer is not part of the MAC python installation.

Please follow the instructions below:

## Install PIP:

Details for this procedure can be found here:

<https://phoenixnap.com/kb/install-pip-mac>

## Install Pip on macOS via get-pip.py

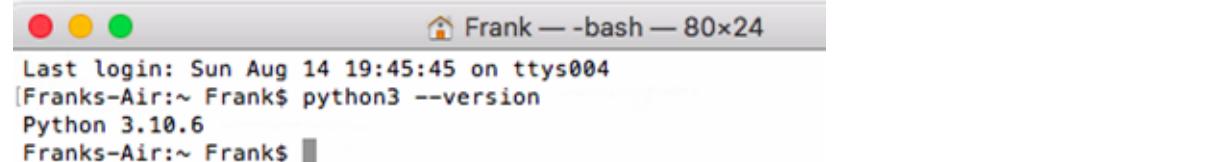
The get-pip.py method installs pip via the command line. The script automatically downloads and installs the pip package for Python. Follow the steps below to install Pip:

1. Press Command + Space Bar and type in *Terminal*. Click the app icon to open a new terminal window.

2. Check your Python version to make sure **Python3** is installed:

```
python3 --version
```

```
marko@MacBook-Pro ~ % python3 --version
Python 3.9.6
marko@MacBook-Pro ~ %
```



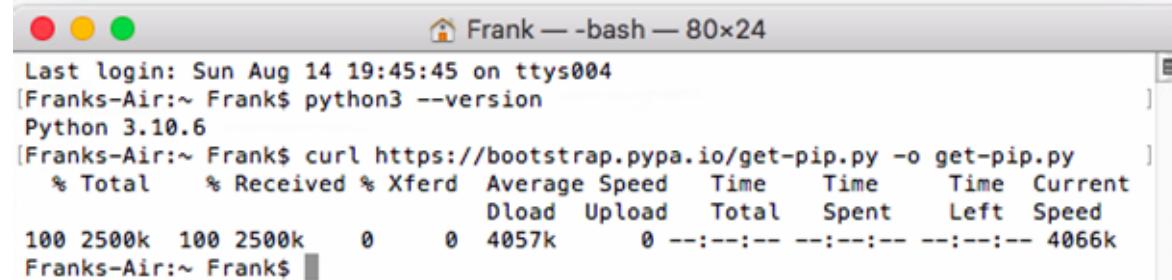
```
Last login: Sun Aug 14 19:45:45 on ttys004
[Franks-Air:~ Frank$ python3 --version
Python 3.10.6
Franks-Air:~ Frank$
```

3. Download pip by running the following command:

```
curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py
```

The [curl command](#) allows you to specify a direct download link. Use the `-o` option to set the name of the downloaded file.

```
marko@MacBook-Pro ~ % curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py
% Total    % Received % Xferd  Average Speed   Time   Time   Time  Current
          Dload  Upload   Total   Spent    Left  Speed
100 1911k  100 1911k     0      0  2046k      0  --:--:--  --:--:-- 2046k
```

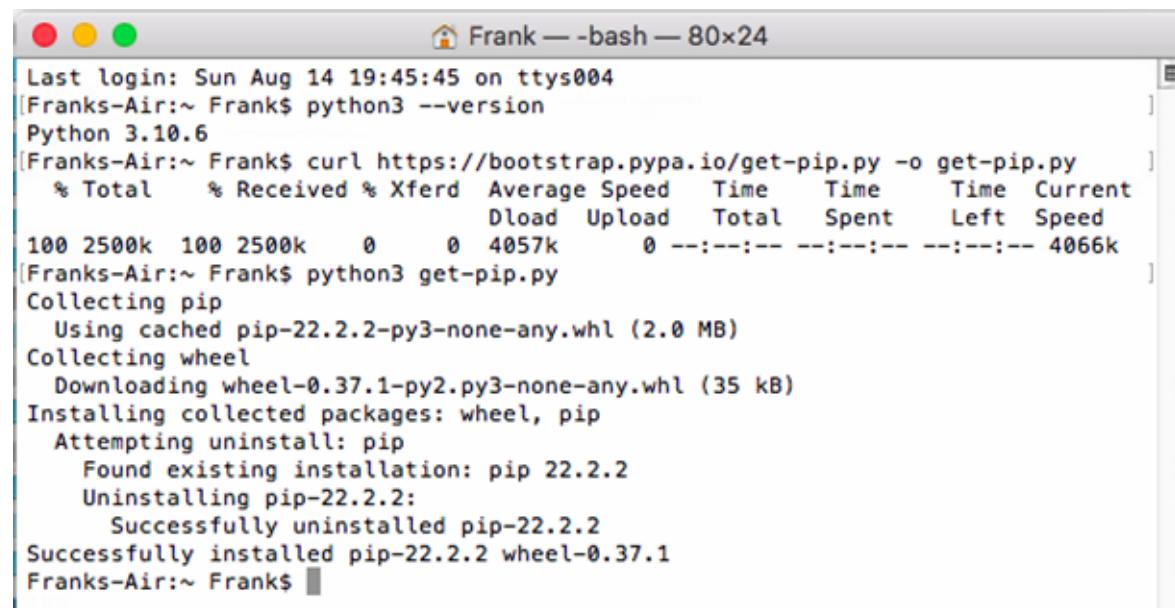


```
Last login: Sun Aug 14 19:45:45 on ttys004
[Franks-Air:~ Frank$ python3 --version
Python 3.10.6
[Franks-Air:~ Frank$ curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py
% Total    % Received % Xferd  Average Speed   Time   Time   Time  Current
          Dload  Upload   Total   Spent    Left  Speed
100 2500k  100 2500k     0      0  4057k      0  --:--:--  --:--:-- 4066k
Franks-Air:~ Frank$
```

4. Install the downloaded package by running:

```
python3 get-pip.py
```

```
[marko@MacBook-Pro ~ % python3 get-pip.py
Collecting pip
  Using cached pip-21.2.4-py3-none-any.whl (1.6 MB)
Collecting wheel
  Downloading wheel-0.37.0-py2.py3-none-any.whl (35 kB)
Installing collected packages: wheel, pip
  Attempting uninstall: pip
    Found existing installation: pip 21.2.4
    Uninstalling pip-21.2.4:
      Successfully uninstalled pip-21.2.4
Successfully installed pip-21.2.4 wheel-0.37.0
```



```
Last login: Sun Aug 14 19:45:45 on ttys004
[Franks-Air:~ Frank$ python3 --version
Python 3.10.6
[Franks-Air:~ Frank$ curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py
% Total    % Received % Xferd  Average Speed   Time     Time     Current
          Dload  Upload   Total Spent    Left  Speed
100 2500k  100 2500k    0     0  4057k      0 --:--:-- --:--:-- 4066k
[Franks-Air:~ Frank$ python3 get-pip.py
Collecting pip
  Using cached pip-22.2.2-py3-none-any.whl (2.0 MB)
Collecting wheel
  Downloading wheel-0.37.1-py2.py3-none-any.whl (35 kB)
Installing collected packages: wheel, pip
  Attempting uninstall: pip
    Found existing installation: pip 22.2.2
    Uninstalling pip-22.2.2:
      Successfully uninstalled pip-22.2.2
Successfully installed pip-22.2.2 wheel-0.37.1
Franks-Air:~ Frank$
```

Wait for the installation to finish. Now you have successfully installed pip on your Mac.

## Install module keyboard

To install the module keyboard. Open the terminal on Mac and insert the command: "pip install keyboard"

```
[Franks-Air:~ Frank$ pip install keyboard
Requirement already satisfied: keyboard in /Library/Frameworks/Python.framework/
Versions/3.10/lib/python3.10/site-packages (0.13.5)
Requirement already satisfied: pyobjc in /Library/Frameworks/Python.framework/Ve-
rsions/3.10/lib/python3.10/site-packages (from keyboard) (8.5)
Requirement already satisfied: pyobjc-framework-Cocoa==8.5 in /Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages (from pyobjc->keyb-
oard) (8.5)
Requirement already satisfied: pyobjc-framework-CoreMIDI==8.5 in /Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages (from pyobjc->keyb-
oard) (8.5)
Requirement already satisfied: pyobjc-framework-GameCenter==8.5 in /Library/Frameworks/Python.framework/Versions/3.10/lib/python3.10/site-packages (from pyobjc->keyb-
oard) (8.5)
Franks-Air:~ Frank$ ]
```

## Fix Certification Error in Python for Mac

(already done at the end of Python installation)

Unfortunately, there is a certification issue in Python for Mac. This issue will not allow to access HTTPS websites like Github via Python.

The following steps are taken from this site:

[How To Fix Python Error Certificate Verify Failed: Unable To Get Local Issuer Certificate In Mac OS \(dev2qa.com\)](https://dev2qa.com/how-to-fix-python-error-certificate-verify-failed-unable-to-get-local-issuer-certificate-in-mac-os/)

### 1. Fix Certificate Verify Failed: Unable To Get Local Issuer Certificate Error Steps.

1. Open mac os finder, then click **Applications** ( on Finder window left side ) —> **Python 3.7** folder (on Finder window right side) to expand it. Your python may have a different version. You can find the **Install Certificates.command** program in the **Python 3.7** folder.
2. Double click the **Install Certificates.command** file to run it. It will open another popup terminal window and show below command execution output text.
3. Last login: Mon Jun 24 15:53:52 on ttys002
4. /Applications/Python\ 3.7/Install\ Certificates.command ; exit;
5. songs-MacBook-Pro:~ songzhao\$ /Applications/Python\ 3.7/Install\ Certificates.command ; exit;

```
6. -- pip install --upgrade certifi

7. Requirement already up-to-date: certifi in
   /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-
   packages (2019.6.16)

8. -- removing any existing file or link

9. -- creating symlink to certifi certificate bundle

10. -- setting permissions

11. -- update complete

12. logout

13. Saving session...

14....copying shared history...

15....saving history...truncating history files...

16....completed.

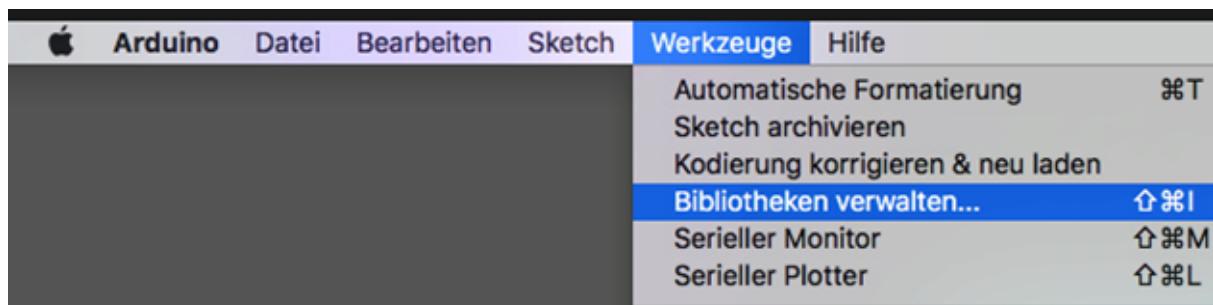
17.

18. [Process completed]
```

19. Close the popup window when the command runs completely successfully.  
Now run the python code again, and the **Certificate Verify Failed** Error will disappear.

## Install MLL in ARDUINO IDE

Open the ARDUINO IDE go to library management and install the newest version of MobaLedLib. See wiki [anleitungen:quickstart \[MobaLedLib Wiki\]](#)



Bibliotheksverwalter

Typ Alle Thema Alle MobaLedLib

**InfraredMLX**  
by Jueff  
**Extension adds infrared features to control MobaLedLib using an infrared remote control**  
[More Info](#)

**MobaLedLib**  
by Hardi (MobaLedLib@gmx.de), Jürgen (MobaLedLib@gmx.at), Dominik (dominik@moba-led-lib.de)

**Arduino library for driving up to 768 (49152 ESP32) LEDs, signals, sound modules or other actuators via one signal line on a model railway**

New in release 3.2.0: LED simulator, Selectrix support for ESP32, important bugfixes

- Excel user interface to configure the LEDs without programming at all improved by the engagement of Pattern Configurator and Program Generator!
- On the basis of WS2811 / WS2812 devices (RGB LEDs), many different effects can easily be controlled via **one wire**:
  - **Animated lighting effects:** animated house, soft blending light signals and crossing lights, traffic lights, flashing vehicle lights, construction site security lights, street lamps, funfair effects, disco, photo flash, ...
  - **Sounds:** 1 Eu sound modules could generate: station announcements, railroad noises, animal sounds, ...
  - **Movements** With additional hardware servo or stepper motors could be controlled in the same way.
- **Easy cabling:** For a model railway the simple wiring is very important. A single 4-pin ribbon cable can supply all consumers on the layout. With multiple plug strips, the LEDs can be flexibly arranged.
- Thanks to **many examples**, no programming knowledge is necessary. Anyone who can operate a text editor is able to adapt these examples to the individual circumstances.
- **Other features:** very low cost, configurable animation sequences, high update rate, reading of 80 and more switches, logical operations, automatic and manual operation (light dependent, timed, CAN bus, random)...
- **Hardware:** The "extras" directory contains schematics and printed circuit boards for this library.

This project would not have been possible without the **fantastic FastLED** library. => Thank you Daniel & Mark

[More Info](#)

Version 3.2.0 [Installieren](#)

Schließen

Dependencies for library MobaLedLib:3.2.0

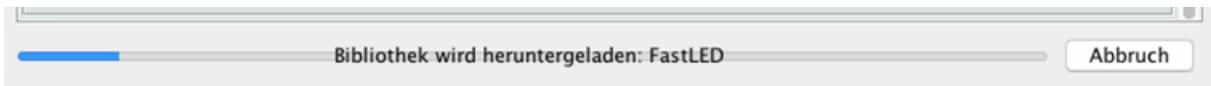
The library **MobaLedLib:3.2.0** needs some other library dependencies currently not installed:

- **FastLED**
- **NmraDcc**
- **ATtinySerialOut**
- **DIO2**
- **EWMA**
- **MobaTools**
- **TimerOne**
- **U8g2**

Would you like to install also all the missing dependencies?

[Install all](#) [Install 'MobaLedLib' only](#) [Abbruch](#)

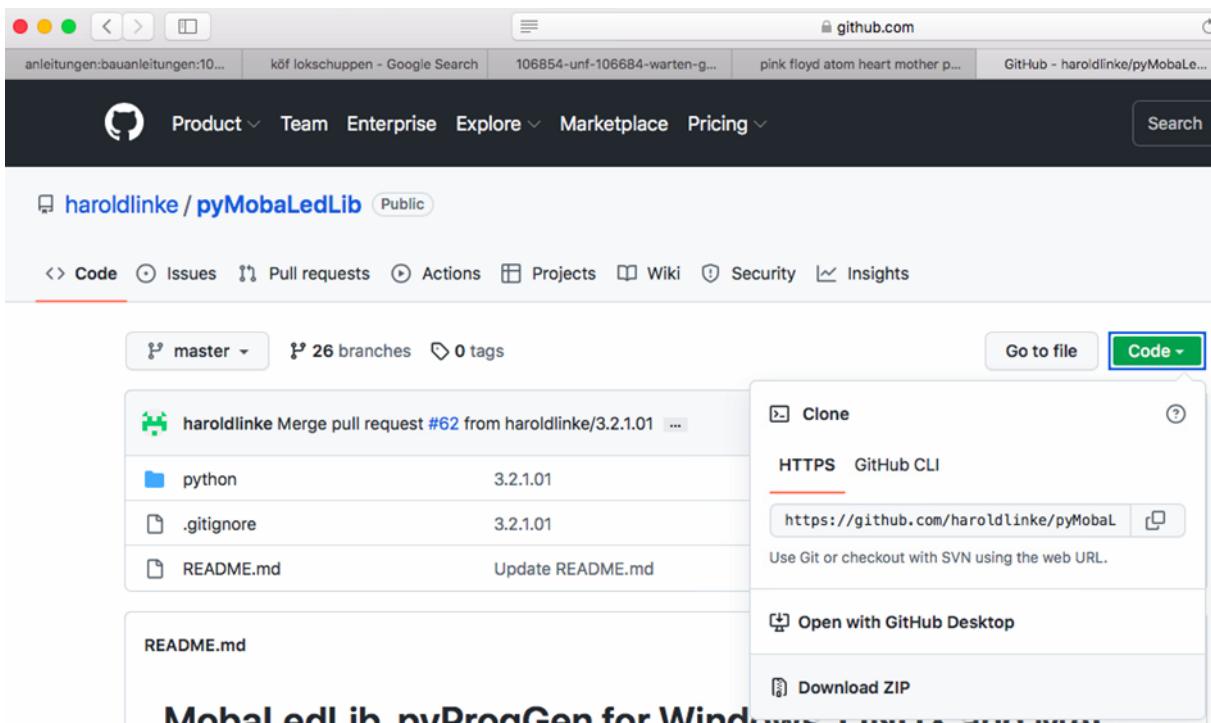
Choose „Install all“



## Install pyMobaLedLib

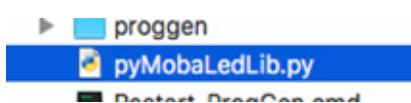
Open the following github page: <https://github.com/haroldlinke/pyMobaLedLib>

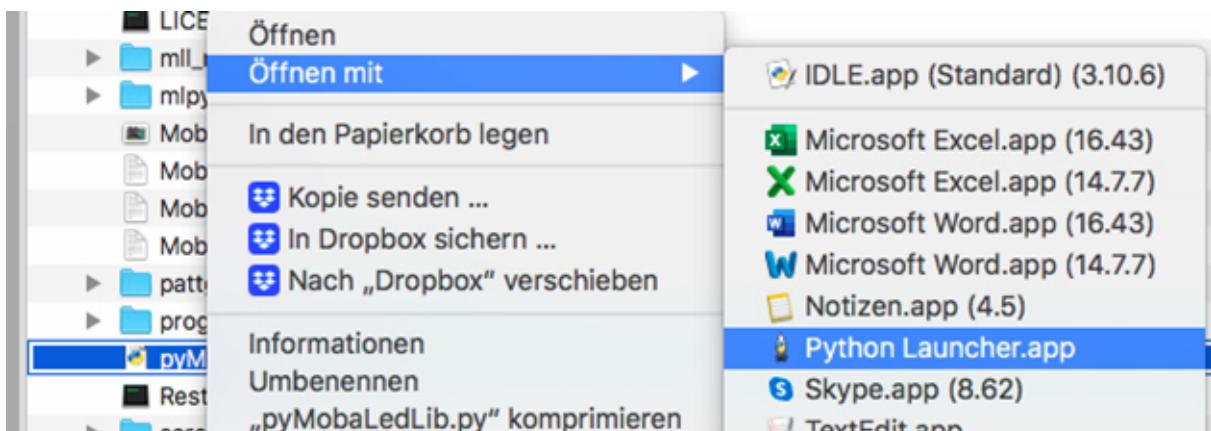
Click on the green button named “Code”. Select “download ZIP”. Save the ZIP in any folder you want.



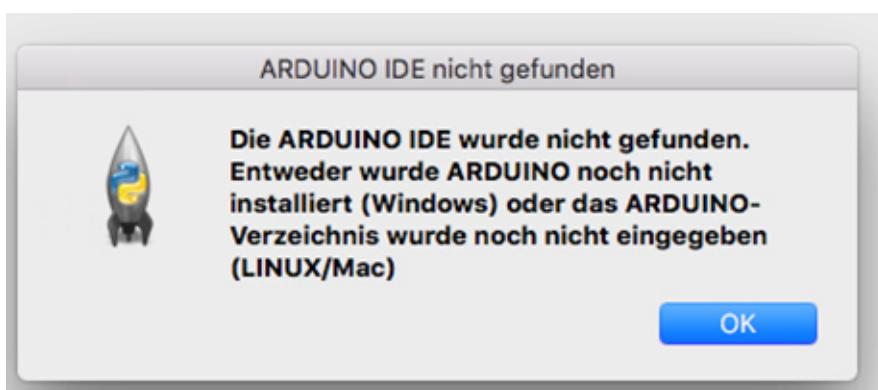
Extract the ZIP file.

Open pyMobaLedLib using the python launcher by selecting the file pyMobaLedLib.py  
("yourPath\pyMobaLedLib\python\pyMobaLedLib.py")





After starting pyMobaLedLib will first check if the ARDUINO IDE and the necessary libraries are accessible.



As it does not know yet where the ARDUINO IDE can be found, an error message will be shown. Ignore this error and specify later in the tab “ARDUINO Einstellungen” the directory path to the ARDUINO IDE.

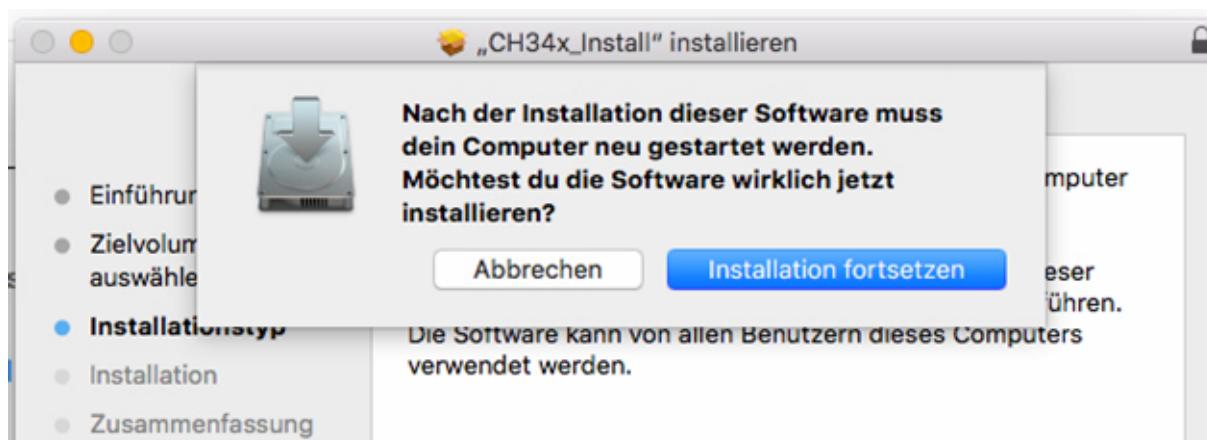
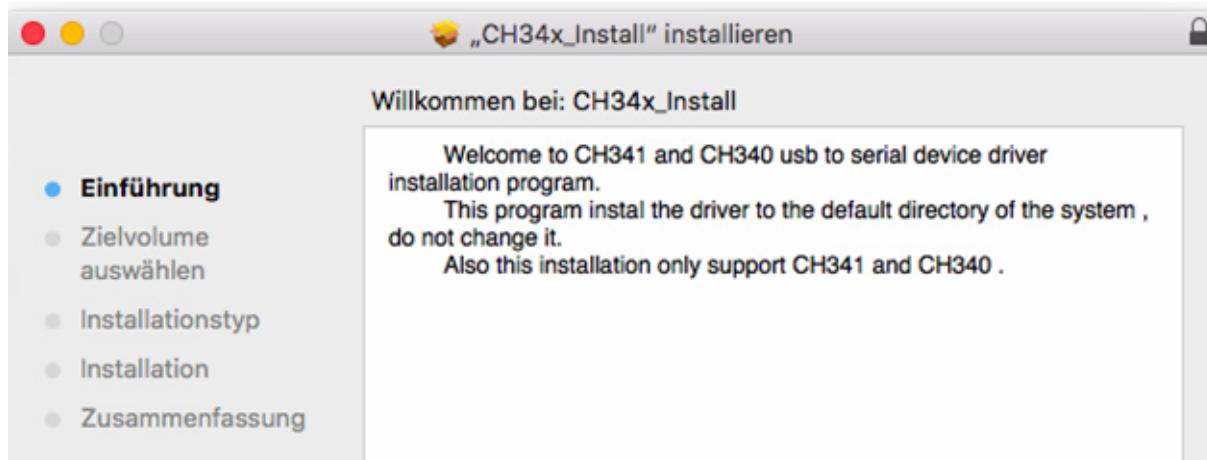


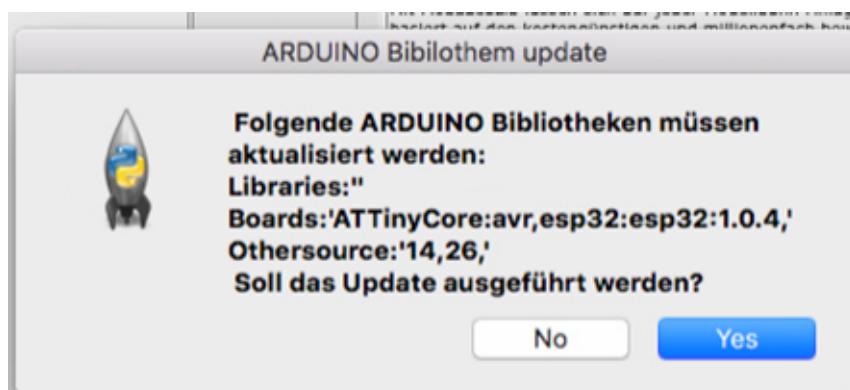
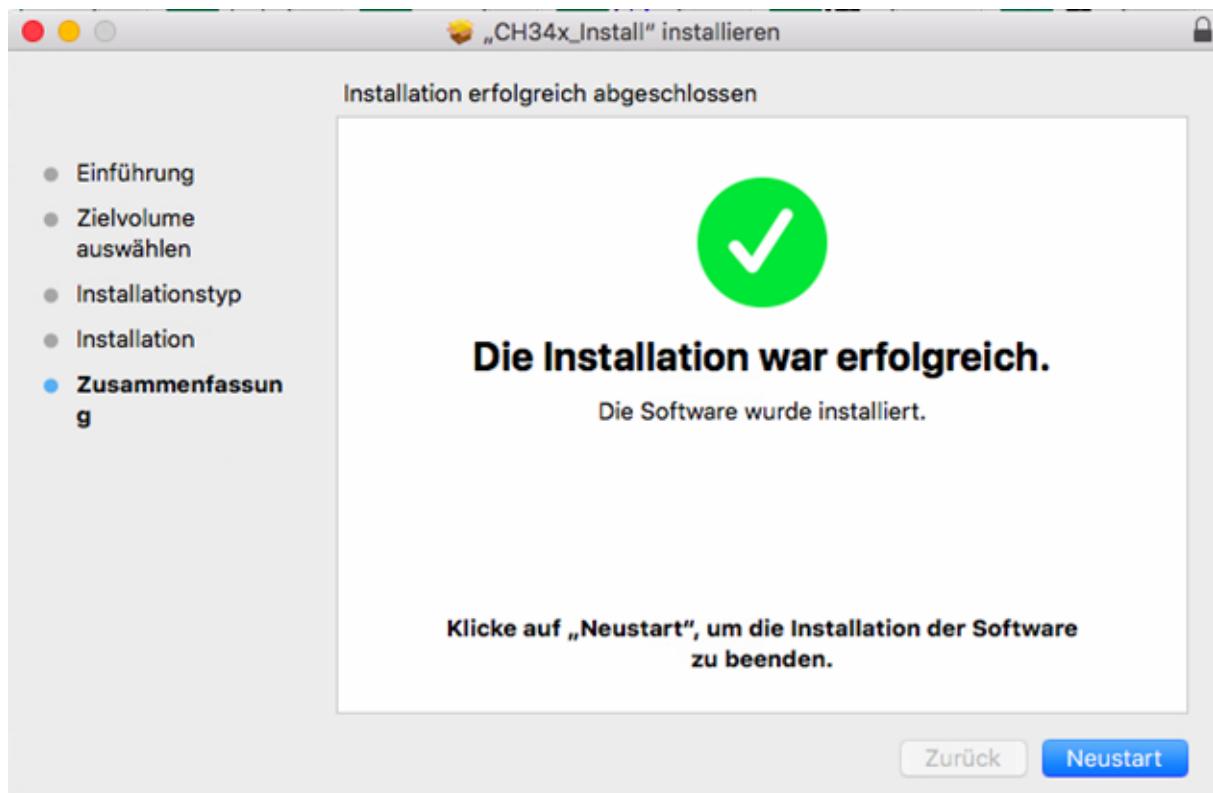
If some libraries are not installed yet, pyMobaLedLib will issue a message and ask if the libraries should be installed. This installation can take some time. The installation is only possible when you followed the steps for fixing the **certification error in Python**.

After these steps pyMobaLedLib should run on your Mac.

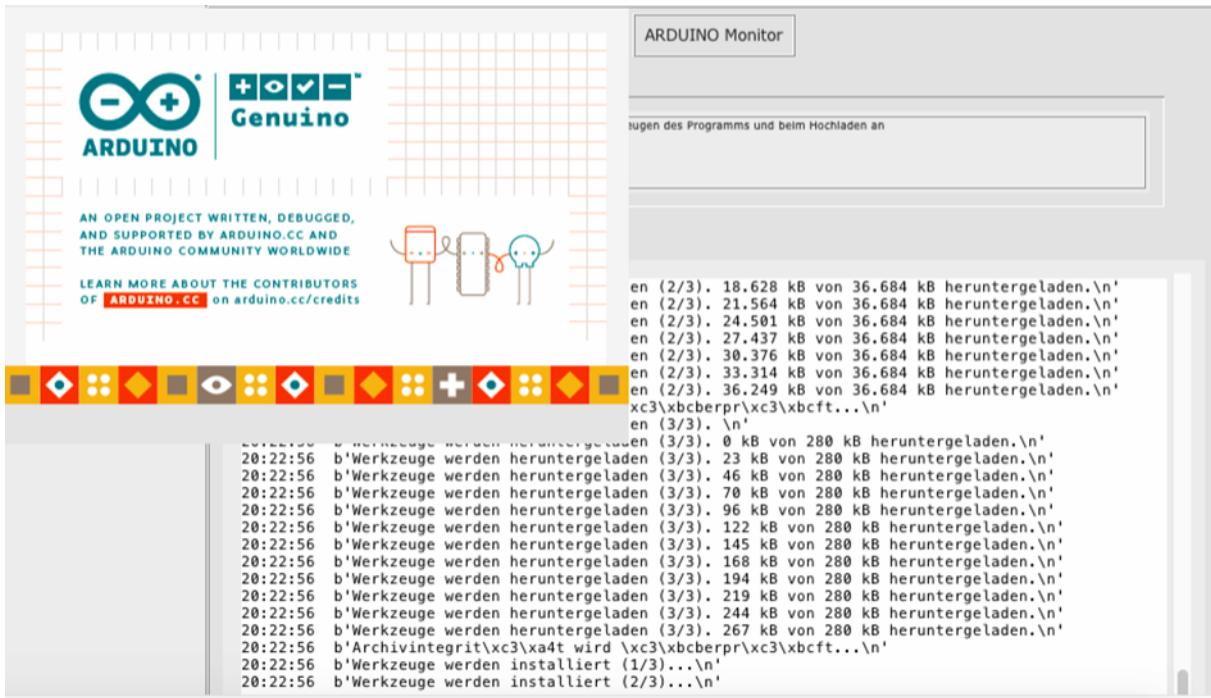
# CH340 ?

[https://github.com/adrianmihalko/ch340g-ch34g-ch34x-mac-os-x-driver/raw/master/CH34x\\_Install\\_V1.5.pkg](https://github.com/adrianmihalko/ch340g-ch34g-ch34x-mac-os-x-driver/raw/master/CH34x_Install_V1.5.pkg)

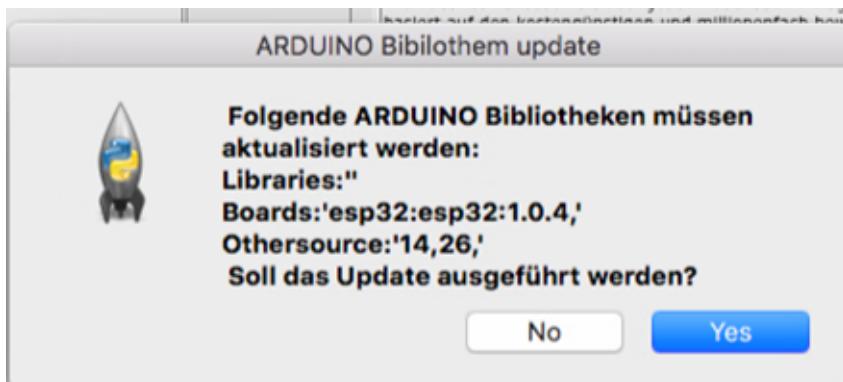




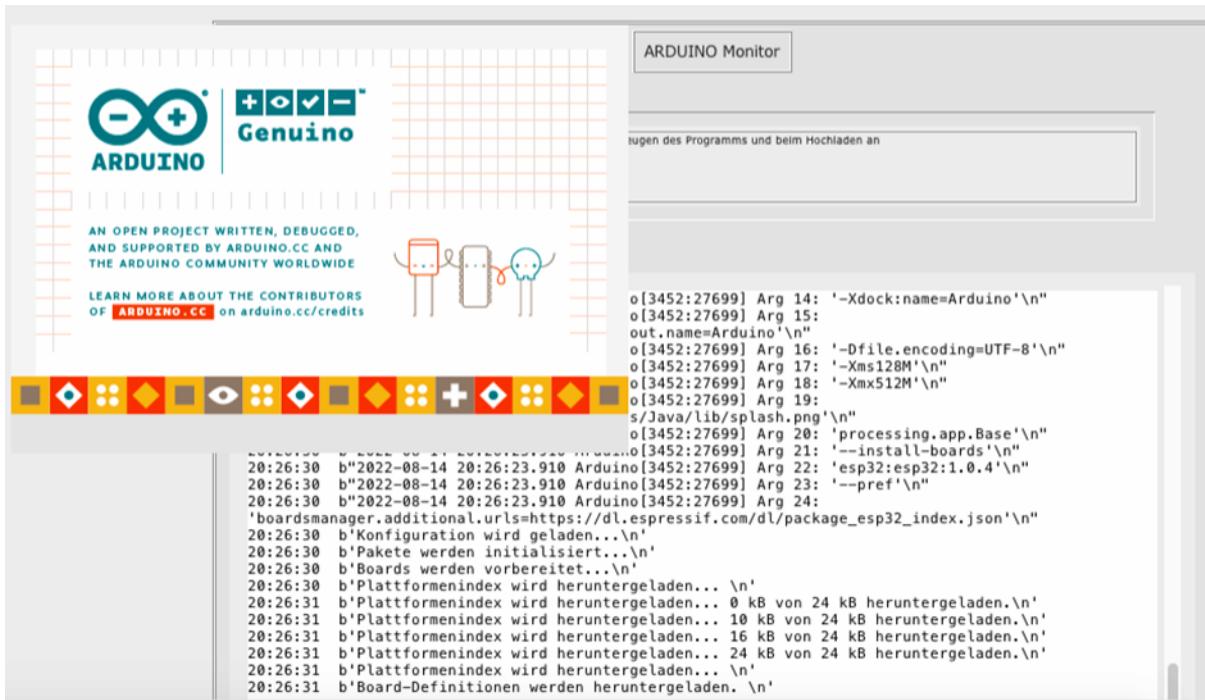
Yes



Absturz

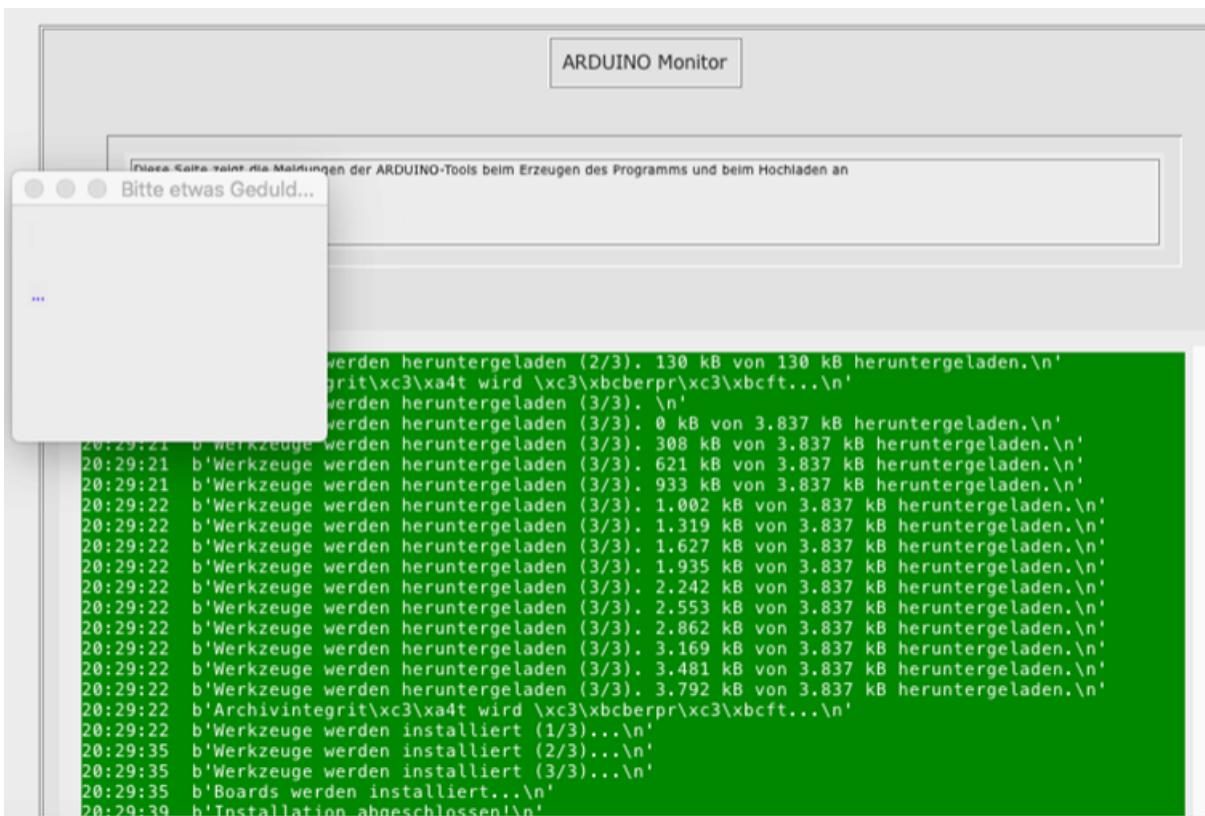


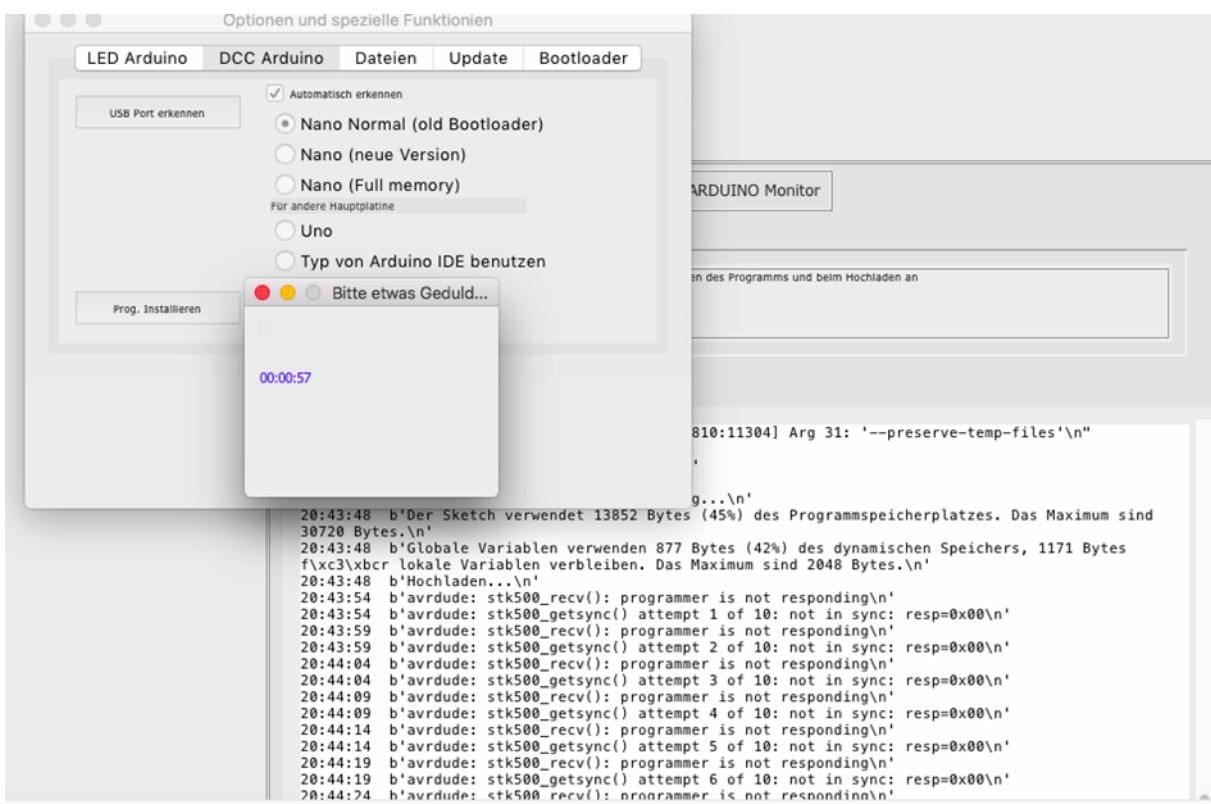
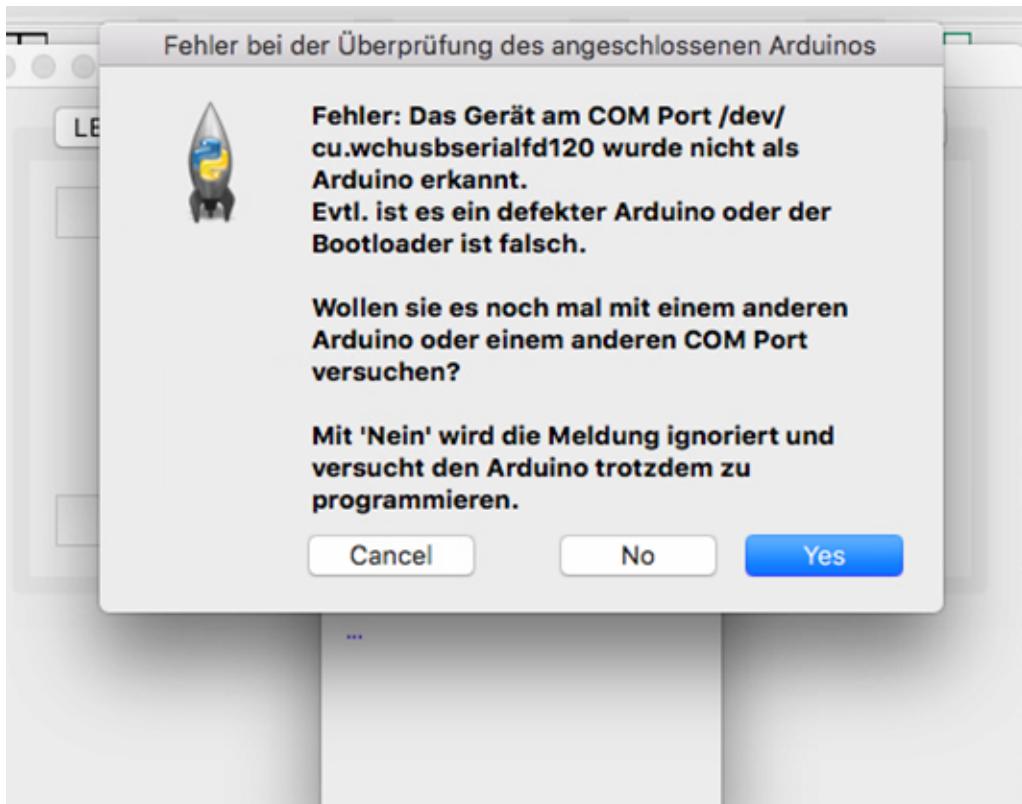
Yes

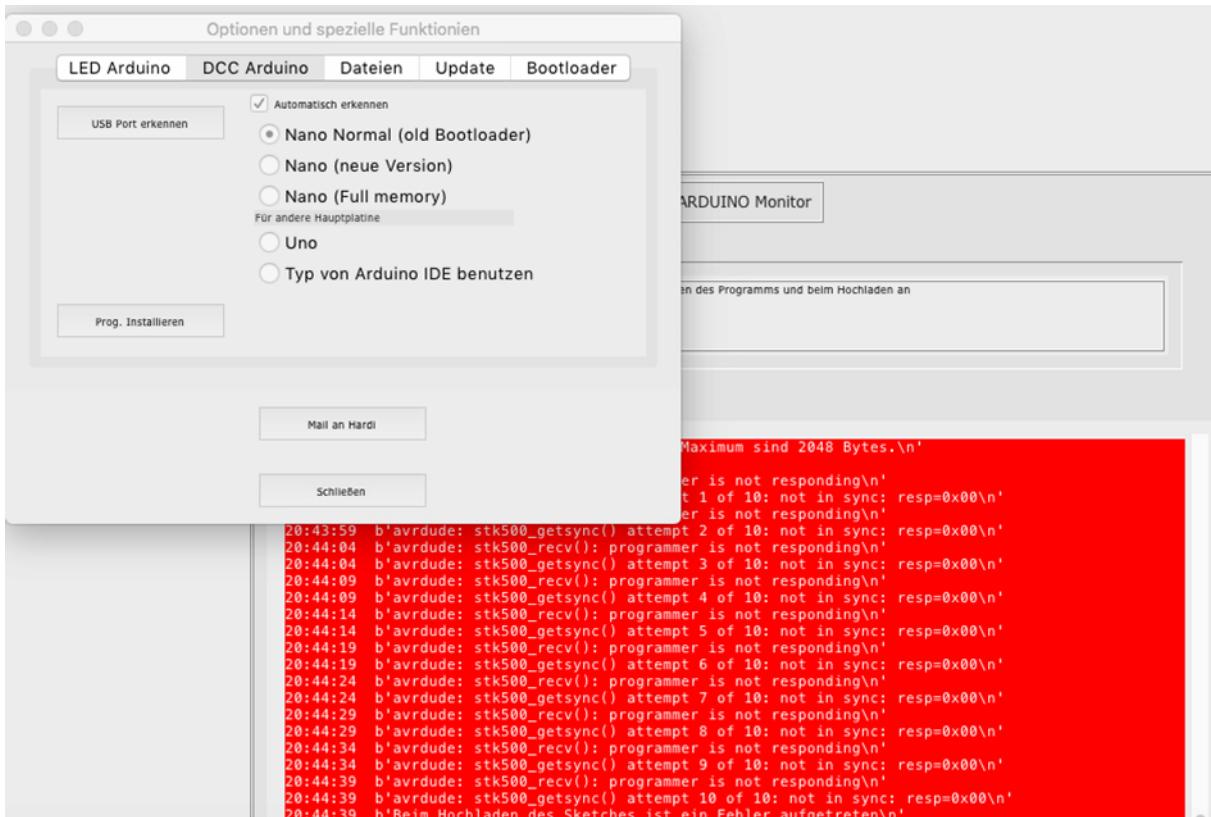


Absturz

3ter Versuch







## Known Issues:

The Automatic ARDUINO detection may not work correctly. You may have to use the checkbox “show unknown devices” in the USB selection dialog.

MLL extensions are not implemented yet.

Installing the software on the DCC-ARDUINO is not tested completely yet and might fail.