



# INSTALATION MANUAL

SonoUno: Sonification Software for astronomical data  
files presented in table format.

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## 1. Software description

SonoUno is a sonification software for two column tables of astronomical data. The software is being developed based on the study of other software (Sonification Sandbox, MathTrax and xSonify) and standards of accessibility like the ISO 9241-171:2008 (Guidance on software accessibility). In order to develop the first approach of graphical user interface, we perform a theoretical framework based on bibliography of user cases, focused on blind and visual impairment people.

The develop language is Python and we use modular design, in order to do collaborative work. The sonoUno now is multiplatform, tested on windows 10, Ubuntu 16.04 and Mac High Sierra; the development team work continuously to maintain this benefit. The principal goal of the SonoUno is to allow the user to open data files (txt or csv extension), reproduce the plot and sonification of the data. At the moment, the sonification is perform by variation of pitch in different instruments.

Additionally, SonoUno allow to select a specific range of data on the 'x' axis, mark and save point of interest in the data, apply predefined mathematical functions (for example, logarithm and square) and manipulate the data arrays with an Octave interface. In the section settings, the user can configure the plot and change between several predefined instruments (acoustic piano, clavinet, celesta and tubular bells, between others). We expect to include more sound configurations shortly.

Finally, the software allows the user to save the sound, the plot, a text file with the points marked on the data and a csv file with the plotted data.

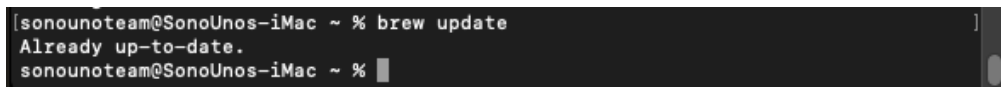
## 2. Software installation

### 2.1. MacOS Catalina

#### 2.1.1. Octave installation

In this instructive we install octave with homebrew, but you can install it with other package manager for Mac OS. We don't use the dmg package because it can be open from terminal.

1. First, we check if we have brew installed (Image 1):
  - a. brew update



```
sonounoteam@SonoUnos-iMac ~ % brew update  
Already up-to-date.  
sonounoteam@SonoUnos-iMac ~ %
```

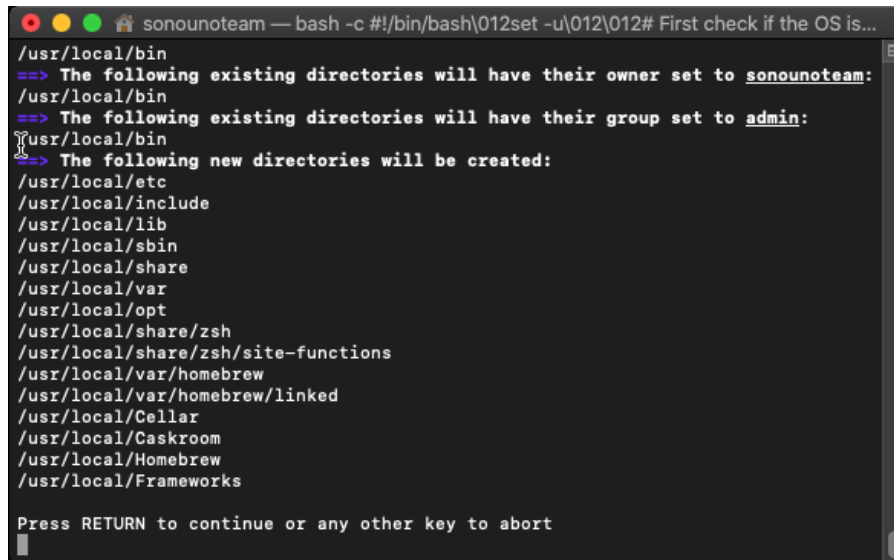
*Image 1 - Shown the command brew update, in this case brew is up to date, if not the terminal shown some other messages indicating the actualization.*

2. If that line give an error, you can install brew with (Image 2, Image 3, Image 4):
  - a. `/bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install.sh)"`



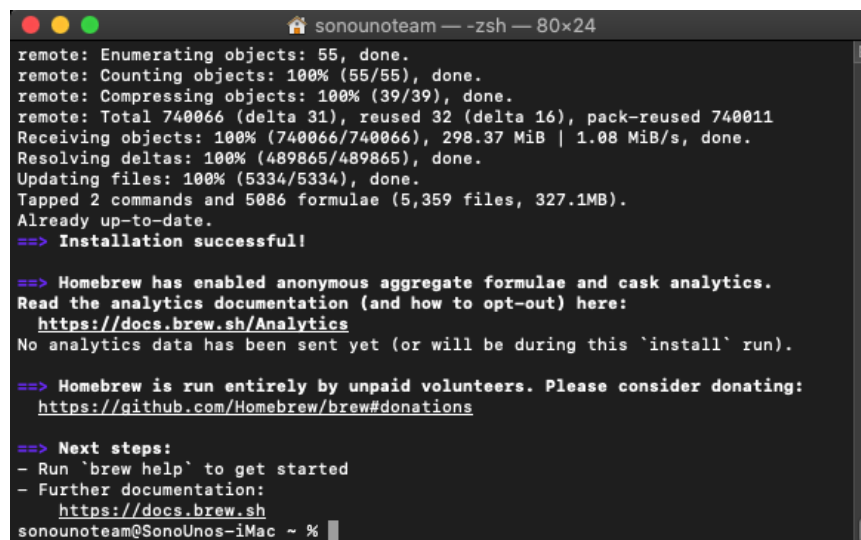
```
sonounoteam — sudo - bash -c #!/bin/bash\012set -u\012\012# First check if the...
[sonounoteam@SonoUnos-iMac ~ % /bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install.sh)"
Password:
```

Image 2 - Brew installation on MacOS with a command extracted from “https://brew.sh/”. After press enter the terminal ask for the user password.



```
sonounoteam — bash -c #!/bin/bash\012set -u\012\012# First check if the OS is...
/usr/local/bin
==> The following existing directories will have their owner set to sonounoteam:
/usr/local/bin
==> The following existing directories will have their group set to admin:
/usr/local/bin
==> The following new directories will be created:
/usr/local/etc
/usr/local/include
/usr/local/lib
/usr/local/sbin
/usr/local/share
/usr/local/var
/usr/local/opt
/usr/local/share/zsh
/usr/local/share/zsh/site-functions
/usr/local/var/homebrew
/usr/local/var/homebrew/linked
/usr/local/Cellar
/usr/local/Caskroom
/usr/local/Homebrew
/usr/local/Frameworks
Press RETURN to continue or any other key to abort
```

Image 3 - After enter the user password the installation process describe which path will be created or modified and ask if the user want to continue or abort.



```
sonounoteam — -zsh — 80x24
remote: Enumerating objects: 55, done.
remote: Counting objects: 100% (55/55), done.
remote: Compressing objects: 100% (39/39), done.
remote: Total 740066 (delta 31), reused 32 (delta 16), pack-reused 740011
Receiving objects: 100% (740066/740066), 298.37 MiB | 1.08 MiB/s, done.
Resolving deltas: 100% (489865/489865), done.
Updating files: 100% (5334/5334), done.
Tapped 2 commands and 5086 formulae (5,359 files, 327.1MB).
Already up-to-date.
==> Installation successful!

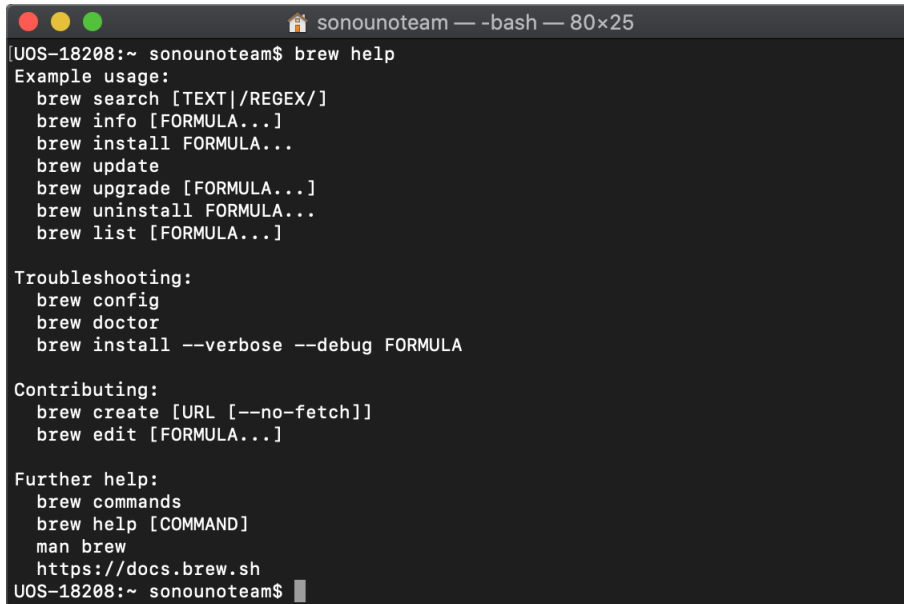
==> Homebrew has enabled anonymous aggregate formulae and cask analytics.
Read the analytics documentation (and how to opt-out) here:
https://docs.brew.sh/Analytics
No analytics data has been sent yet (or will be during this `install` run).

==> Homebrew is run entirely by unpaid volunteers. Please consider donating:
https://github.com/Homebrew/brew#donations

==> Next steps:
- Run `brew help` to get started
- Further documentation:
https://docs.brew.sh
sonounoteam@SonoUnos-iMac ~ %
```

Image 4 - If the installation was successfully, the terminal inform that to the user and show some other recommendations.

3. You can try the command ‘brew help’ to check if brew is installed (Image 5).



```
UOS-18208:~ sonounoteam$ brew help
Example usage:
  brew search [TEXT]/REGEX/
  brew info [FORMULA...]
  brew install FORMULA...
  brew update
  brew upgrade [FORMULA...]
  brew uninstall FORMULA...
  brew list [FORMULA...]

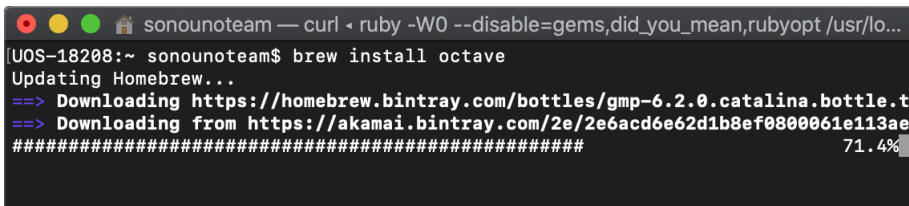
Troubleshooting:
  brew config
  brew doctor
  brew install --verbose --debug FORMULA

Contributing:
  brew create [URL [--no-fetch]]
  brew edit [FORMULA...]

Further help:
  brew commands
  brew help [COMMAND]
  man brew
  https://docs.brew.sh
UOS-18208:~ sonounoteam$
```

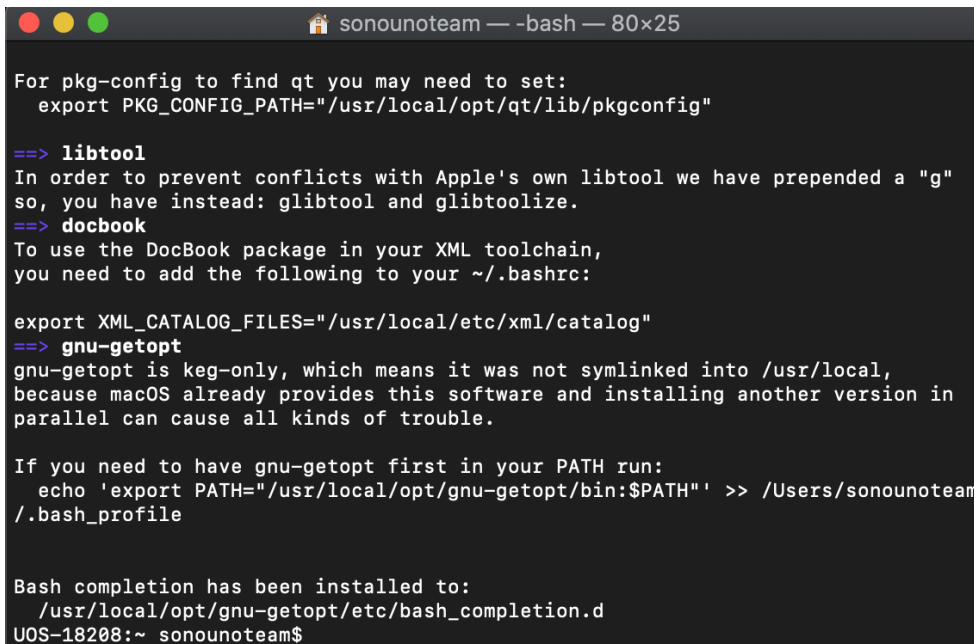
Image 5 - Shown the result of the command `brew help`, the message contain an example usage section, troubleshooting, contributing and further help.

4. Now we can run the next command to install octave (Image 6, Image 7):
  - a. `brew install octave`



```
UOS-18208:~ sonounoteam$ brew install octave
Updating Homebrew...
==> Downloading https://homebrew.bintray.com/bottles/gmp-6.2.0.catalina.bottle.t
==> Downloading from https://akamai.bintray.com/2e/2e6acd6e62d1b8ef0800061e113ae
##### 71.4%
```

Image 6 - Shown the command `brew install octave` and the first part of the installation when brew is updating itself.



```
For pkg-config to find qt you may need to set:
export PKG_CONFIG_PATH="/usr/local/opt/qt/lib/pkgconfig"

==> libtool
In order to prevent conflicts with Apple's own libtool we have prepended a "g"
so, you have instead: glibtool and glibtoolize.
==> docbook
To use the DocBook package in your XML toolchain,
you need to add the following to your ~/.bashrc:

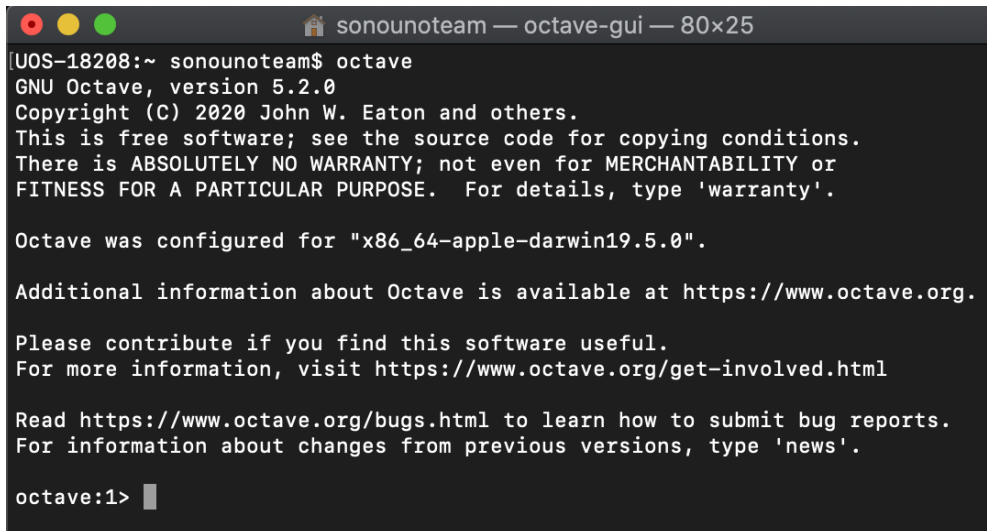
export XML_CATALOG_FILES="/usr/local/etc/xml/catalog"
==> gnu-getopt
gnu-getopt is keg-only, which means it was not symlinked into /usr/local,
because macOS already provides this software and installing another version in
parallel can cause all kinds of trouble.

If you need to have gnu-getopt first in your PATH run:
echo 'export PATH="/usr/local/opt/gnu-getopt/bin:$PATH"' >> /Users/sonounoteam
.bash_profile

Bash completion has been installed to:
/usr/local/opt/gnu-getopt/etc/bash_completion.d
UOS-18208:~ sonounoteam$
```

Image 7 - Shown the last part of the octave installation.

5. To test if octave is installed correctly you can run on terminal the command 'octave', if the program is installed, the octave terminal is opened on the same windows (Image 8).



```

UOS-18208:~ sonounoteam$ octave
GNU Octave, version 5.2.0
Copyright (C) 2020 John W. Eaton and others.
This is free software; see the source code for copying conditions.
There is ABSOLUTELY NO WARRANTY; not even for MERCHANTABILITY or
FITNESS FOR A PARTICULAR PURPOSE. For details, type 'warranty'.

Octave was configured for "x86_64-apple-darwin19.5.0".

Additional information about Octave is available at https://www.octave.org.

Please contribute if you find this software useful.
For more information, visit https://www.octave.org/get-involved.html

Read https://www.octave.org/bugs.html to learn how to submit bug reports.
For information about changes from previous versions, type 'news'.

octave:1>

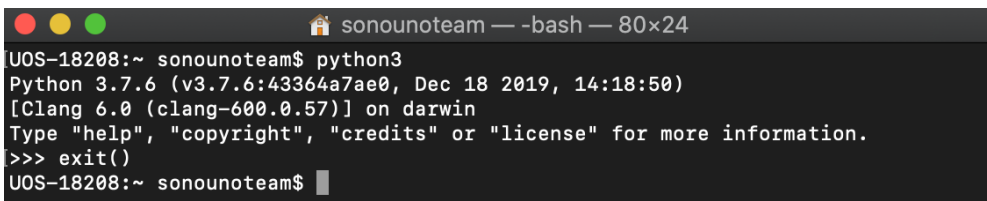
```

Image 8 - Shown the octave command line opened with the command octave.

## 2.1.2. Python installation

If you have python installed on the computer you can skip this section. If not, or you are not sure, follow the next steps.

1. Go to the terminal and execute the 'python3' command (Image 9):



```

UOS-18208:~ sonounoteam$ python3
Python 3.7.6 (v3.7.6:43364a7ae0, Dec 18 2019, 14:18:50)
[Clang 6.0 (clang-600.0.57)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> exit()
UOS-18208:~ sonounoteam$

```

Image 9 - MacOS terminal with the command python executed.

2. If the version is 3.7.x, you can continue with the following steps. If not, you must update or install python 3.7 in the operating system, using the installer on <https://www.python.org/ftp/python/3.7.7/python-3.7.7-macosx10.9.pkg>
3. After install python, check if you have pip installed on your system with the next command (Image 10):
  - a. `python3 -m pip -V`



```

UOS-18208:~ sonounoteam$ python3 -m pip -V
pip 20.1.1 from /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages/pip (python 3.7)
UOS-18208:~ sonounoteam$

```

Image 10 - Show the execution of "pip -V" command and the answer that pip is installed on the system.

**NOTE:** To install pip you can try “easy\_install pip” or “sudo easy\_install pip” if admin privilege is needed. Or download python package from the website and install it.

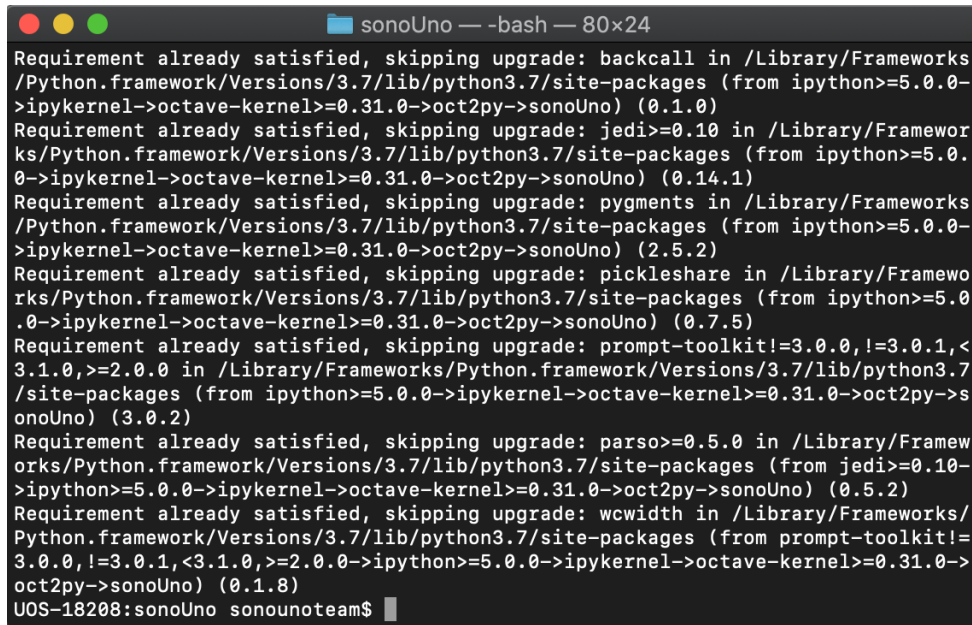
4. Once that we checked that we have python 3 and pip installed (is called python3 in this instructive), we can proceed with the next step.

## 2.1.3. SonoUno installation

### 2.1.3.1. Installation with pip

After you install python3 and verify that pip is installed, you can write the next commands on terminal to install (Image 11) and use sonoUno (Image 12):

1. `sudo python3 -m pip install -U sonoUno`



```

Requirement already satisfied, skipping upgrade: backcall in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from ipython>=5.0.0->ipykernel->octave-kernel>=0.31.0->oct2py->sonoUno) (0.1.0)
Requirement already satisfied, skipping upgrade: jedi>=0.10 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from ipython>=5.0.0->ipykernel->octave-kernel>=0.31.0->oct2py->sonoUno) (0.14.1)
Requirement already satisfied, skipping upgrade: pygments in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from ipython>=5.0.0->ipykernel->octave-kernel>=0.31.0->oct2py->sonoUno) (2.5.2)
Requirement already satisfied, skipping upgrade: pickleshare in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from ipython>=5.0.0->ipykernel->octave-kernel>=0.31.0->oct2py->sonoUno) (0.7.5)
Requirement already satisfied, skipping upgrade: prompt-toolkit!=3.0.0,!<3.1.0,>=2.0.0 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from ipython>=5.0.0->ipykernel->octave-kernel>=0.31.0->oct2py->sonoUno) (3.0.2)
Requirement already satisfied, skipping upgrade: parso>=0.5.0 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from jedi>=0.10->ipython>=5.0.0->ipykernel->octave-kernel>=0.31.0->oct2py->sonoUno) (0.5.2)
Requirement already satisfied, skipping upgrade: wcwidth in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from prompt-toolkit!=3.0.0,!<3.1.0,>=2.0.0->ipython>=5.0.0->ipykernel->octave-kernel>=0.31.0->oct2py->sonoUno) (0.1.8)
UOS-18208:sonoUno sonounoteam$

```

Image 11 - Shown the last part of the sonoUno installation.

2. `sonoUno`

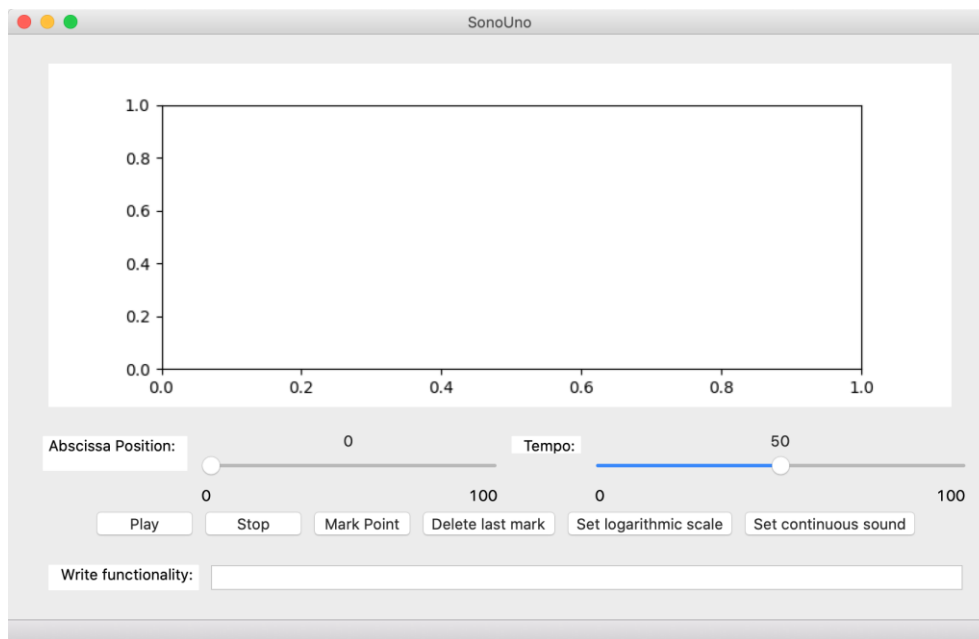


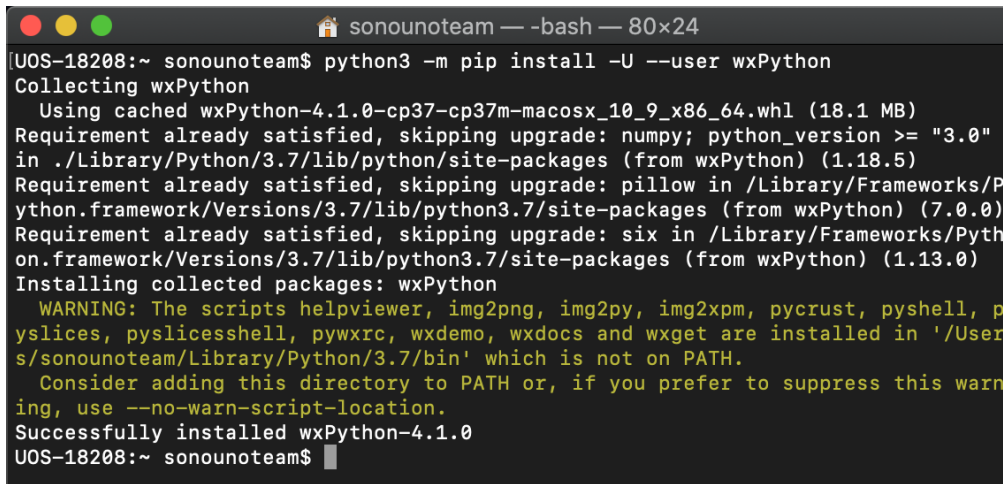
Image 12 - Shown the sonoUno display opened with the command 'sonoUno' after its installation with pip.

The last command 'sonoUno' directly open the software. If you can't install the software with sudo, you can't execute the software with the command 'sonoUno'. In that case, you have to search the sonoUno executable in your system, you can write sonoUno on Finder and open the sonoUno executable there.

#### 2.1.3.2. Installation from source

Here we explain how to install each one of the libraries to run sonoUno from source.

1. Install wxPython Phoenix with the next command (Image 13):
  - a. `python3 -m pip install -U --user wxPython`



```

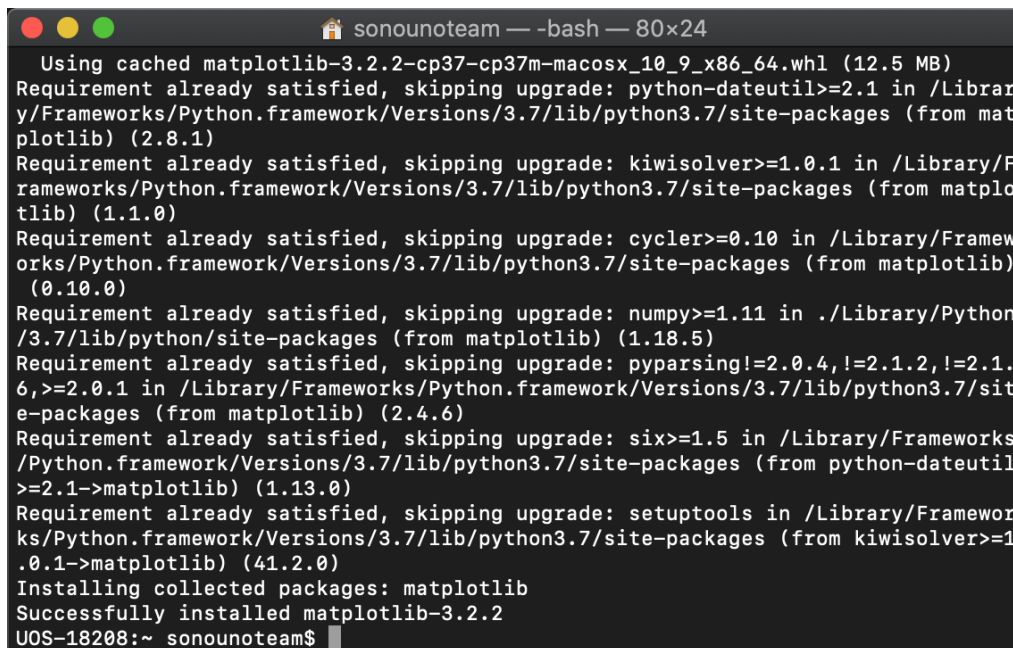
sonounoteam$ python3 -m pip install -U --user wxPython
Collecting wxPython
  Using cached wxPython-4.1.0-cp37-cp37m-macosx_10_9_x86_64.whl (18.1 MB)
Requirement already satisfied, skipping upgrade: numpy in /Library/Python/3.7/lib/python/site-packages (from wxPython) (1.18.5)
Requirement already satisfied, skipping upgrade: pillow in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from wxPython) (7.0.0)
Requirement already satisfied, skipping upgrade: six in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from wxPython) (1.13.0)
Installing collected packages: wxPython
  WARNING: The scripts helpviewer, img2png, img2py, img2xpm, pycrust, pyspell, pyslices, pyslicesshell, pywxrc, wxdemo, wxdocs and wxget are installed in '/Users/sonounoteam/Library/Python/3.7/bin' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-script-location.
Successfully installed wxPython-4.1.0
UOS-18208:~ sonounoteam$

```

Image 13 - Installation of wxPython with the previous command.

**NOTE:** The installation can take several minutes, be patient. If the installation takes more than 30 minutes cancel the process (Ctrl+C) and execute the command once again. The aspect of the installation, can be seeing in Image 13.

2. Install matplotlib (Image 14):
  - a. `python3 -m pip install -U --user matplotlib`



```

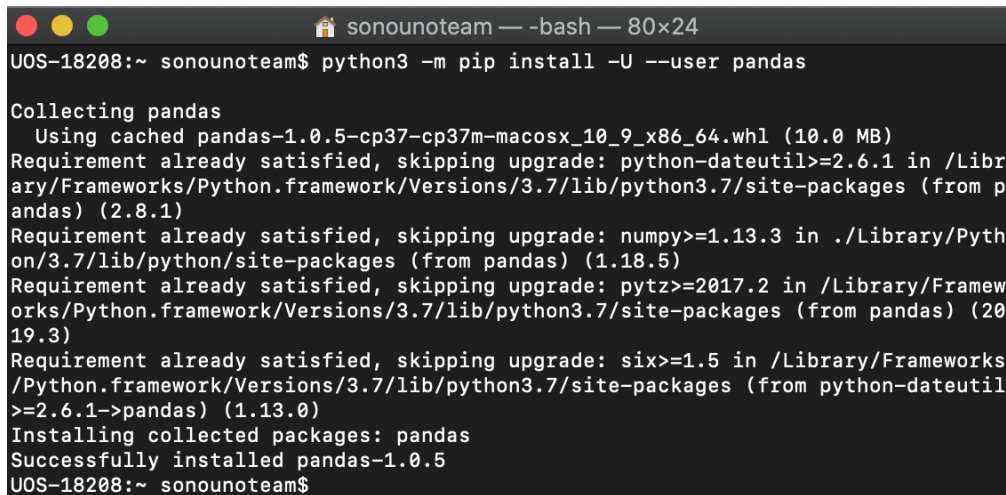
sonounoteam$ python3 -m pip install -U --user matplotlib
Using cached matplotlib-3.2.2-cp37-cp37m-macosx_10_9_x86_64.whl (12.5 MB)
Requirement already satisfied, skipping upgrade: python-dateutil>=2.1 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from matplotlib) (2.8.1)
Requirement already satisfied, skipping upgrade: kiwisolver>=1.0.1 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from matplotlib) (1.1.0)
Requirement already satisfied, skipping upgrade: cyclor>=0.10 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from matplotlib) (0.10.0)
Requirement already satisfied, skipping upgrade: numpy>=1.11 in /Library/Python/3.7/lib/python/site-packages (from matplotlib) (1.18.5)
Requirement already satisfied, skipping upgrade: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.1 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from matplotlib) (2.4.6)
Requirement already satisfied, skipping upgrade: six>=1.5 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from python-dateutil>=2.1->matplotlib) (1.13.0)
Requirement already satisfied, skipping upgrade: setuptools in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from kiwisolver>=1.0.1->matplotlib) (41.2.0)
Installing collected packages: matplotlib
Successfully installed matplotlib-3.2.2
UOS-18208:~ sonounoteam$

```

Image 14 - Last part of the installation of matplotlib with the previous command.

3. Install pandas (Image 15):
  - a. `python3 -m pip install -U --user pandas`



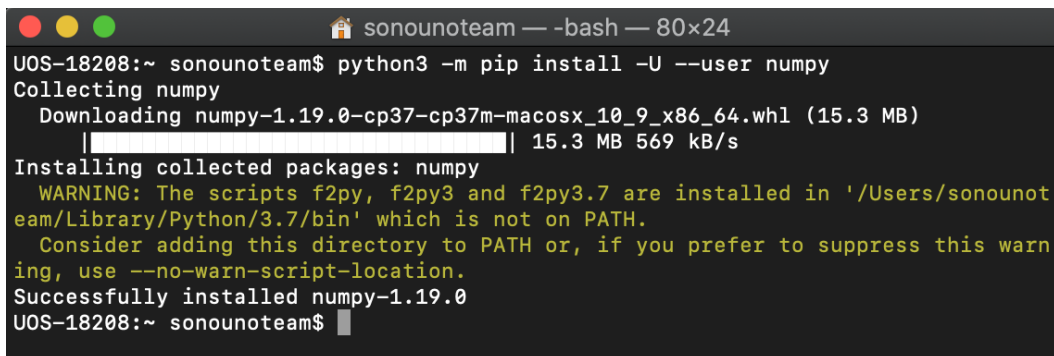
A terminal window titled 'sonounoteam — -bash — 80x24' showing the command 'python3 -m pip install -U --user pandas'. The output shows that pandas-1.0.5 is being installed, with several dependencies already satisfied and skipped for upgrade. The installation is successful.

```
UOS-18208:~ sonounoteam$ python3 -m pip install -U --user pandas

Collecting pandas
  Using cached pandas-1.0.5-cp37-cp37m-macosx_10_9_x86_64.whl (10.0 MB)
Requirement already satisfied, skipping upgrade: python-dateutil>=2.6.1 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from pandas) (2.8.1)
Requirement already satisfied, skipping upgrade: numpy>=1.13.3 in ./Library/Python/3.7/lib/python/site-packages (from pandas) (1.18.5)
Requirement already satisfied, skipping upgrade: pytz>=2017.2 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from pandas) (2019.3)
Requirement already satisfied, skipping upgrade: six>=1.5 in /Library/Frameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from python-dateutil>=2.6.1->pandas) (1.13.0)
Installing collected packages: pandas
Successfully installed pandas-1.0.5
UOS-18208:~ sonounoteam$
```

Image 15 - Installation of pandas with the previous command.

4. Install numpy (Image 16):
  - a. `python3 -m pip install -U --user numpy`

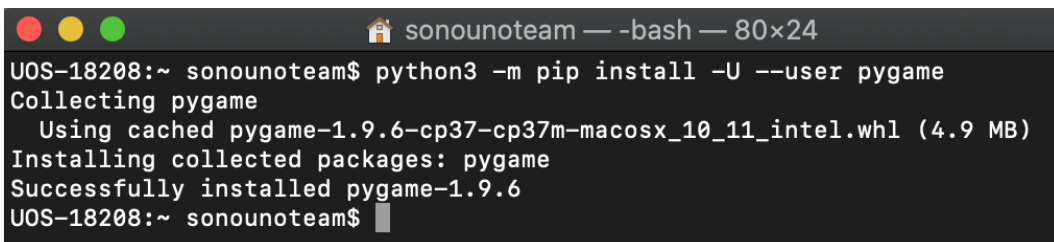
A terminal window titled 'sonounoteam — -bash — 80x24' showing the command 'python3 -m pip install -U --user numpy'. The output shows that numpy-1.19.0 is being downloaded and installed. A warning message is displayed about the installation location not being on the PATH.

```
UOS-18208:~ sonounoteam$ python3 -m pip install -U --user numpy

Collecting numpy
  Downloading numpy-1.19.0-cp37-cp37m-macosx_10_9_x86_64.whl (15.3 MB)
    |#####| 15.3 MB 569 kB/s
Installing collected packages: numpy
  WARNING: The scripts f2py, f2py3 and f2py3.7 are installed in '/Users/sonounoteam/Library/Python/3.7/bin' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-script-location.
Successfully installed numpy-1.19.0
UOS-18208:~ sonounoteam$
```

Image 16 - Installation of numpy with the previous command.

5. Install pygame (Image 17):
  - a. `python3 -m pip install -U --user pygame`

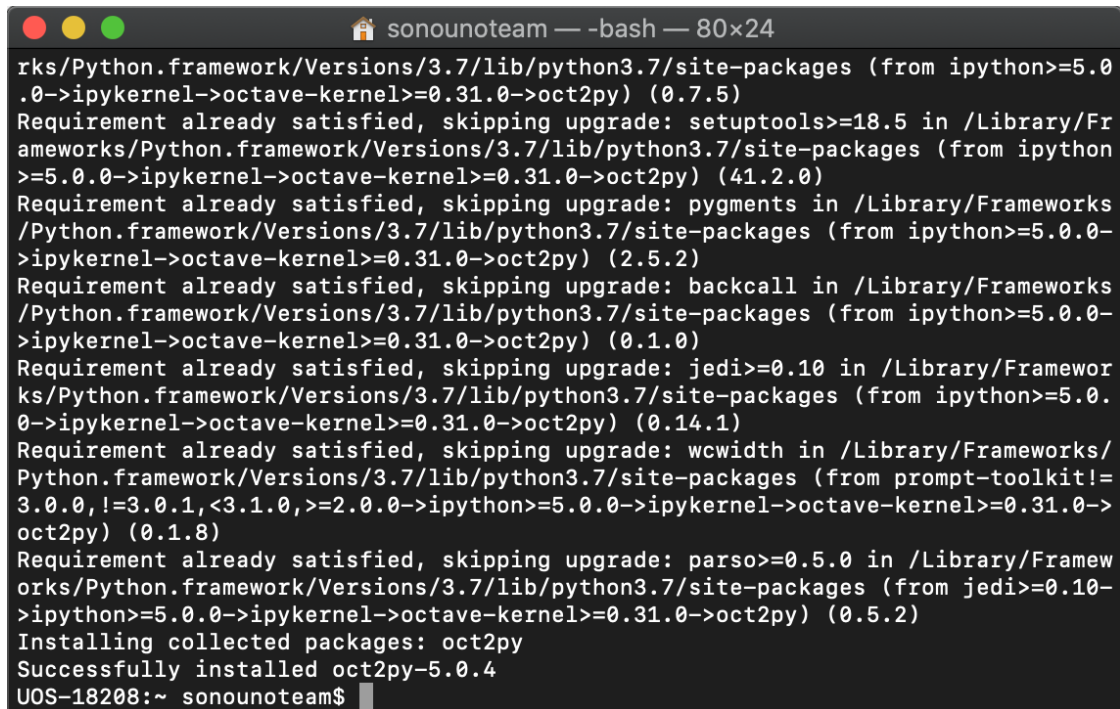
A terminal window titled 'sonounoteam — -bash — 80x24' showing the command 'python3 -m pip install -U --user pygame'. The output shows that pygame-1.9.6 is being installed from a cached wheel file.

```
UOS-18208:~ sonounoteam$ python3 -m pip install -U --user pygame

Collecting pygame
  Using cached pygame-1.9.6-cp37-cp37m-macosx_10_11_intel.whl (4.9 MB)
Installing collected packages: pygame
Successfully installed pygame-1.9.6
UOS-18208:~ sonounoteam$
```

Image 17 - Installation of pygame with the previous command.

6. Install oct2py (Image 18):
  - a. `python3 -m pip install -U --user oct2py`



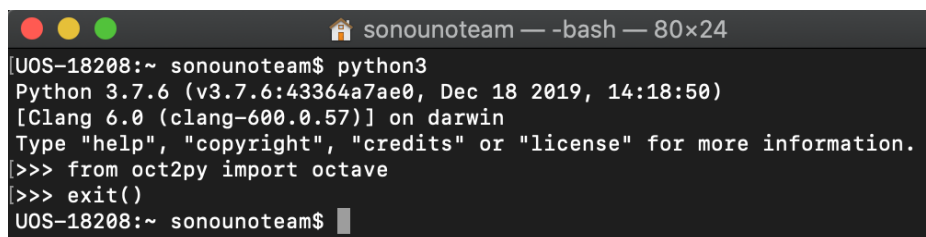
```

rks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from ipython>=5.0
.0->ipykernel->octave-kernel>=0.31.0->oct2py) (0.7.5)
Requirement already satisfied, skipping upgrade: setuptools>=18.5 in /Library/Fr
ameworks/Python.framework/Versions/3.7/lib/python3.7/site-packages (from ipython
>=5.0.0->ipykernel->octave-kernel>=0.31.0->oct2py) (41.2.0)
Requirement already satisfied, skipping upgrade: pygments in /Library/Frameworks
/Python.framework/Versions/3.7/lib/python3.7/site-packages (from ipython>=5.0.0-
>ipykernel->octave-kernel>=0.31.0->oct2py) (2.5.2)
Requirement already satisfied, skipping upgrade: backcall in /Library/Frameworks
/Python.framework/Versions/3.7/lib/python3.7/site-packages (from ipython>=5.0.0-
>ipykernel->octave-kernel>=0.31.0->oct2py) (0.1.0)
Requirement already satisfied, skipping upgrade: jedi>=0.10 in /Library/Frameworks
/Python.framework/Versions/3.7/lib/python3.7/site-packages (from ipython>=5.0.
0->ipykernel->octave-kernel>=0.31.0->oct2py) (0.14.1)
Requirement already satisfied, skipping upgrade: wcwidth in /Library/Frameworks/
Python.framework/Versions/3.7/lib/python3.7/site-packages (from prompt-toolkit!=
3.0.0,!=3.0.1,<3.1.0,>=2.0.0->ipython>=5.0.0->ipykernel->octave-kernel>=0.31.0->
oct2py) (0.1.8)
Requirement already satisfied, skipping upgrade: parso>=0.5.0 in /Library/Frameworks
/Python.framework/Versions/3.7/lib/python3.7/site-packages (from jedi>=0.10-
>ipython>=5.0.0->ipykernel->octave-kernel>=0.31.0->oct2py) (0.5.2)
Installing collected packages: oct2py
Successfully installed oct2py-5.0.4
UOS-18208:~ sonounoteam$

```

Image 18 - Last part of the installation of oct2py with the previous command.

7. Try that 'oct2py' was installed correctly with python3 on the terminal following the next steps:
  - a. Open python3 on the terminal with the command:
    - i. `python3`
  - b. Import 'octave' from 'oct2py' library with the command:
    - i. `from oct2py import octave`
8. If 'octave' is imported without problems (Image 19), type 'exit()' and jump to 'Run the software' section of this manual. On the other hand, if an error appears contact the development team.



```

UOS-18208:~ sonounoteam$ python3
Python 3.7.6 (v3.7.6:43364a7ae0, Dec 18 2019, 14:18:50)
[Clang 6.0 (clang-600.0.57)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
[>>> from oct2py import octave
[>>> exit()
UOS-18208:~ sonounoteam$

```

Image 19 - Shows the oct2py library importation command without errors.

**NOTE:** if any of the libraries is missing, the software does not run. The installation can take several minutes.

#### 2.1.4. Run the software

1. Unzip the file, if it is compressed. If you want to clone from github use the next line:
  - a. `git clone https://github.com/sonoUnoTeam/sonoUno.git`
2. Open a terminal and go to the software folder. Probably you have more than one folder before you can run SonoUno. To check in which folder is sonoUno, use the command "`ls`" (Image 20). The sonoUno must be among the files and the manual in the folder.

```

sonoUno — -bash — 80x24
UOS-18208:~ sonounoteam$ cd Documents/
UOS-18208:Documents sonounoteam$ ls
SonoUno      Zoom      emiliano    github
UM           bitbucket extras
UOS-18208:Documents sonounoteam$ cd github/
UOS-18208:github sonounoteam$ ls
sonoUno
UOS-18208:github sonounoteam$ cd sonoUno/
UOS-18208:sonoUno sonounoteam$ ls
README.md    dist      setup.cfg    setup.py      sonoUno
UOS-18208:sonoUno sonounoteam$ cd sonoUno/
UOS-18208:sonoUno sonounoteam$ ls
LICENSE.txt  data_import  sample_data
User manual - v3.1.docx data_transform sonoUno
User manual - v3.1.pdf gui          sonoUno.egg-info
__init__.py  logo.icns   sound_module
data_export  logo.ico
UOS-18208:sonoUno sonounoteam$

```

Image 20 - Aspect of the sonoUno folder on the command window.

3. Once you are sure that you are at the right folder, make:
  - a. `python3 sonoUno`
4. A window must be open (Image 21), if that is the case, the soft is ready to be used.

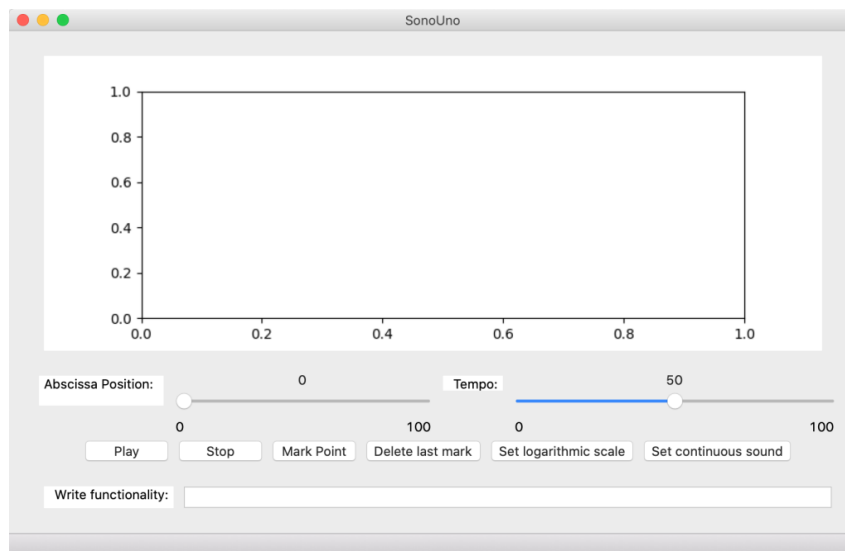


Image 21 - SonoUno main window on Mac.

### 2.1.5. Possible problems

Sometimes, after the updates of octave or xcode, even after python updates, the dependencies can be change or in some cases can be broken. In that situation the software stop running and through different errors, like the libraries are not found or errors related with octave.

You have to check which python you are using and specify on the system the path to the specific python. Clean and erase the python that you don't use is a very good practice.

If you have problems with octave you can try with 'brew reinstall octave', or uninstall and install it again.

### 3. Import a file to the software

Once the software is installed, and you can open it, you are ready to try your first dataset. The initial window of the software only shows the plot and the reproduction options of the data (Image 21), the other functionalities are hidden and were shown in the user manual. This design was based on a user cases study and ISO standards.

In order to probe the SonoUno, you have to import a data file. If you don't have a data file, the installer provides a folder named "data" with simple functions on the installation directory or you can download this folder from github.



Image 22 - Open a file: choose the item Open on the menu File.

The first step to open a data file, is to select the item Open on the menu File (Image 22). This action shows a new window of the file system of the computer, where you can choose the data file. Once you have the data file selected, press the button "Open" (Image 23).

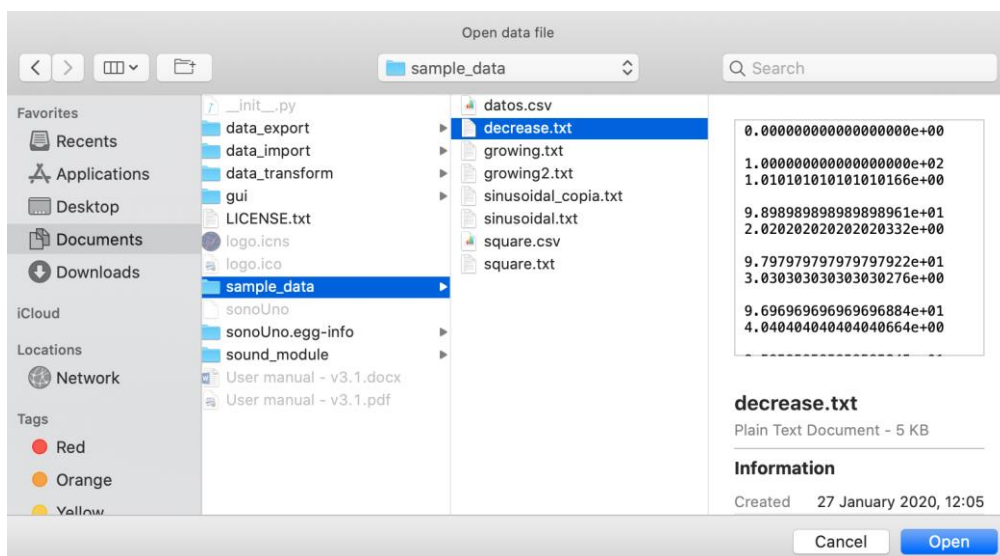


Image 23 - New window of the file system of the computer.

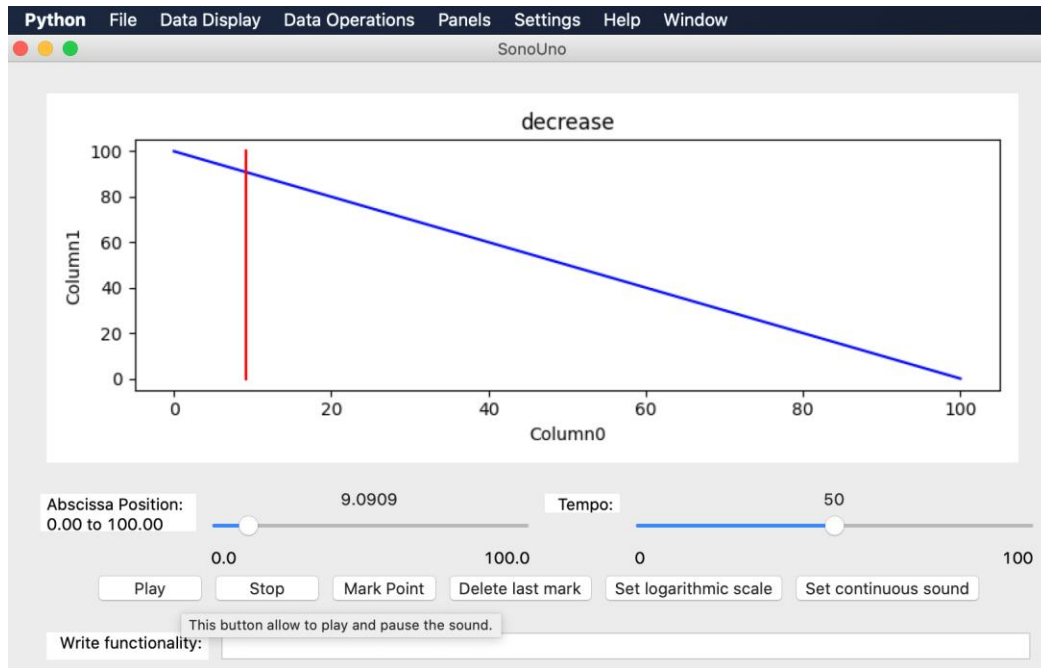


Image 24 - Reproduction of the data file after press the button Play.

After open the data file, the SonoUno show the plot and is ready to reproduce the sound. In order to reproduce it, you have to press the button Play (Image 24). If the software installation is correct, you must listen a pitch variation and see a red vertical bar moving through the data, this bar indicate the position of the data that is been sonificated.

If the software doesn't produce sound, check the speakers or headphones on your computer. If the problems continue or you have another problem, inform this to the developer team.