# AbMining ToolBox Required Software Installation Guide

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# Contents

# Required software installation

This document will help you to install the necessary software to be able to analyze your deep sequencing datasets of your antibody library or selection outputs using AbMining ToolBox on any of the popular computer platforms MS Windows, linux and Mac OS.

## *MS Windows platform*

The installation process will be demonstrated on a Windows 7 operating system.
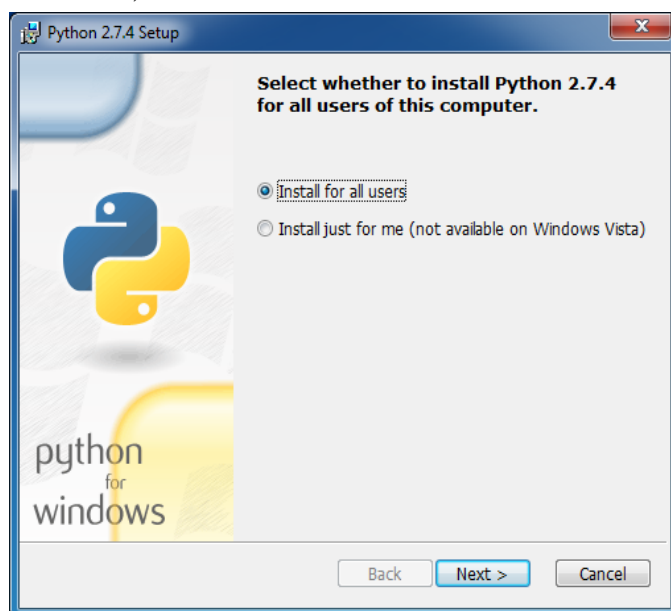
## Installation of python 2.7

Python is not installed by default on windows operating systems. In order to run the software, you need to download the appropriate python interpreter. At the time of writing this document, the latest version of the 2.x branch of python is 2.7.4. The AbMining ToolBox software is guaranteed to run on the 2.6-2.7 version. However, **do not use python 3.x** branch**.**
You can download a working version of python by clicking the link below:

http://www.python.org/ftp/python/2.7.4/python-2.7.4.msi
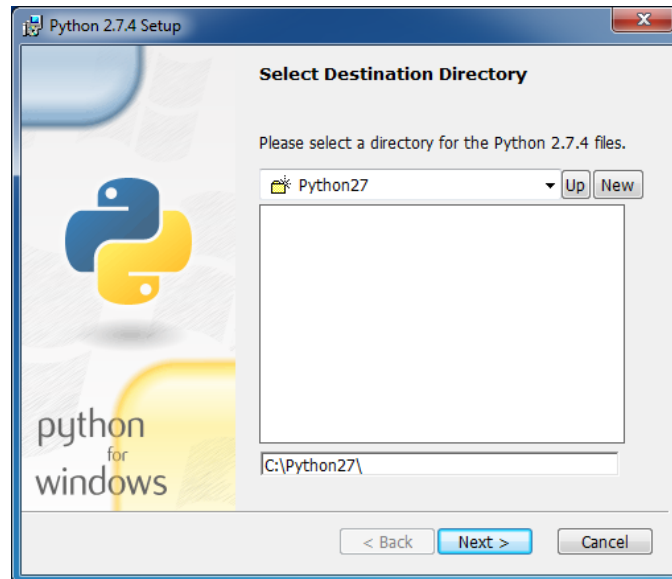
After the download has finished, start the installer.



*Figure 1: Select your installation preference*
*(Default: All users)*

If you don't have any particular preference, just install python in it default directory, which is
`c:\python27\`

*Figure 2:* Choose you preferred directory or use the default location and **click on Next**

Customize your installation on the next screen if you wish. Our software works well with the default options



*Figure 3: Customize your python installation and*
***click Next***

Click on Finish after installation

*Figure 4:* Complete the python installation by
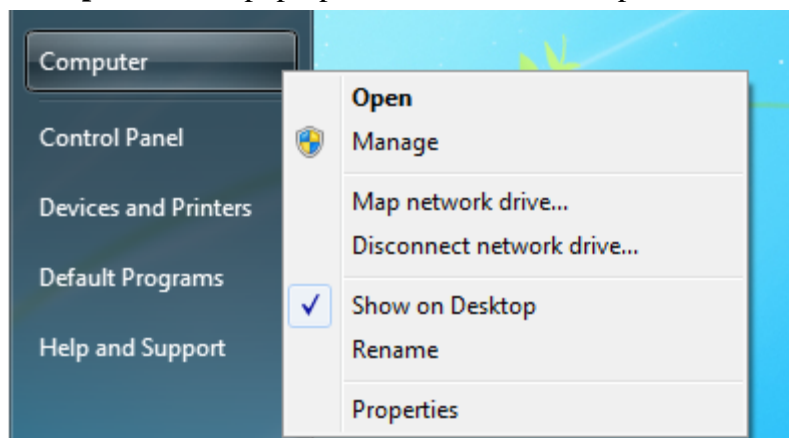**clicking on Finish**

## Change the system Path variable

You need to add python to the system path in order to run your scripts easily. Click on your

Windows button  in the bottom left corner on your screen.

Right click on the **Computer** in the pop-up menu and choose Properties:



*Figure 5:* Clicking on the Windows button, the Start  Menu
will pop up. **Right click on the Computer!**s

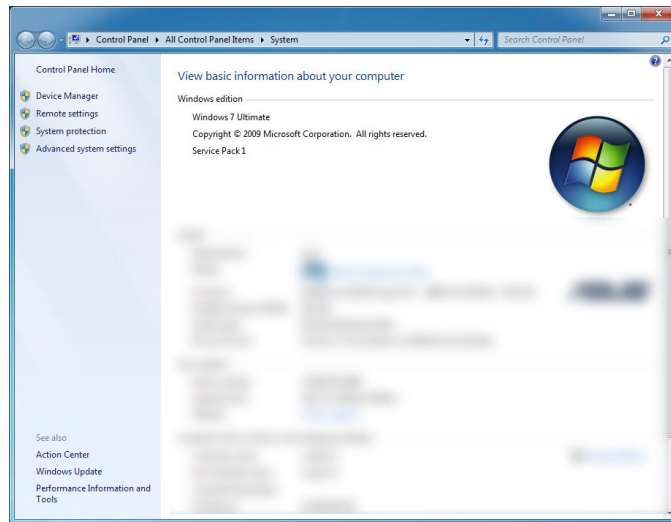The System Screen of the control Panel will open up:

*Figure 6:* The System panel on Windows 7. Click
on **Advanced system settings** in the left panel

The System Properties window will open. Choose the **Advanced Tab** on the top and click on
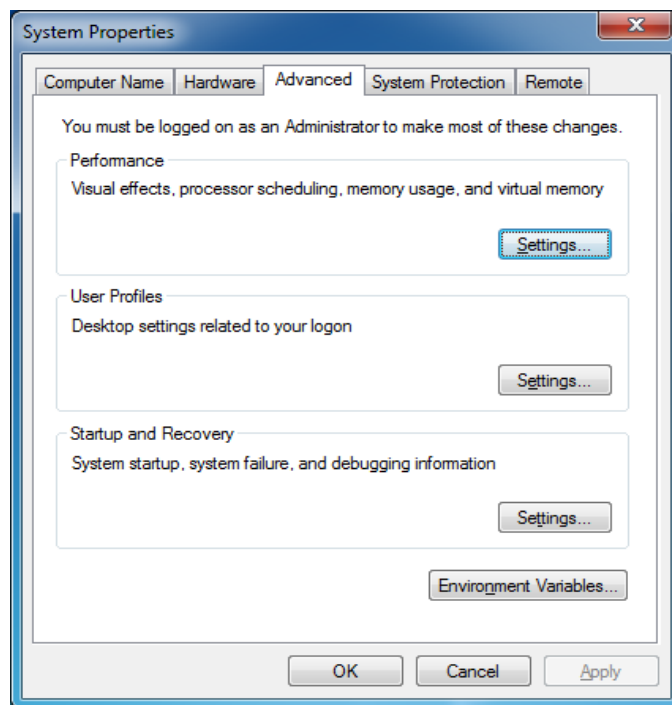**Environment Variables...**



*Figure 7:* The System Properties window. **Click on
the Environment Variables...**

The Environment Variables window will open. In the **System variables** part of the window scroll down until you see the **Path** variable:
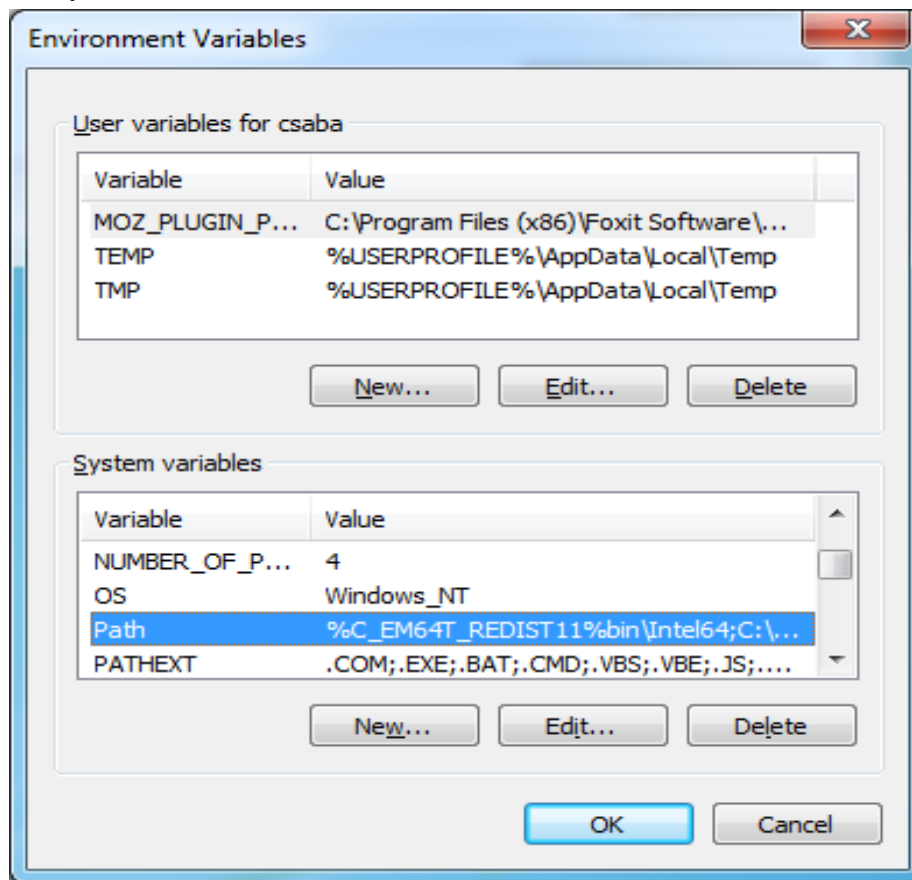


*Figure 8:* **Select the Path variable** from the System variables in the Environment Variables window and **click on Edit...**

The Edit System Variable window will open up. Scroll to the end of the Variable value: and enter the following text:

```
;c:\python27\
```

(If you installed python in a different directory, then enter the installation directory of your python!)
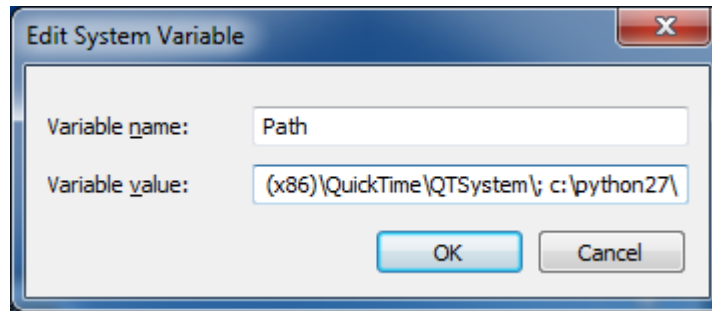
*Figure 9: Edit the Path variable value so that it will
include the python installation directory*

## Testing python installation

It's time to test if your installation works. Click on the Windows button and type **cmd** in the
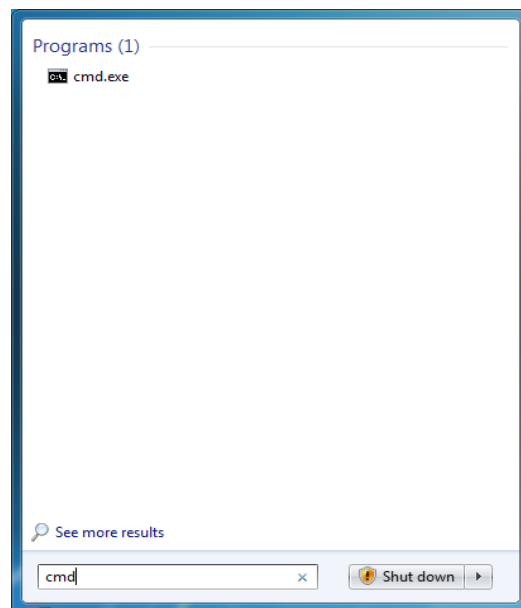Search window:



*Figure 10:* : Open a Command Prompt window by
running cmd.exe

The Command prompt window will open up. Type

```
python
```

at the command prompt. Python should start up and show the version installed; then type

```
quit()
```
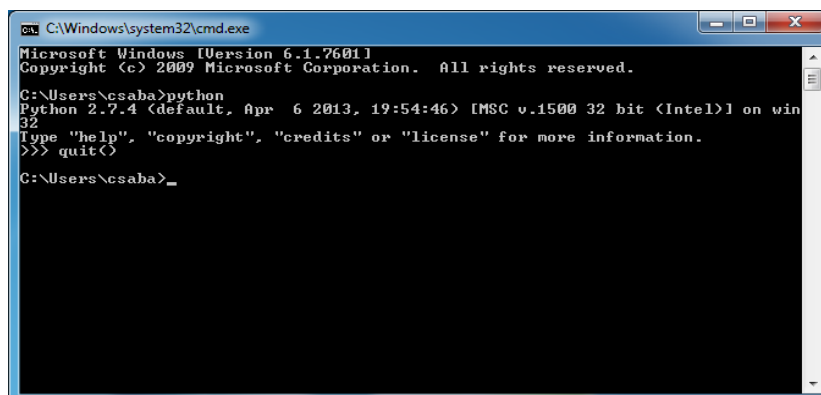
A similar window should appear

*Figure 11: The Command Prompt window shows that python is installed correctly*

## Biopython installation

Download biopython 1.61 by clicking on the link below:

[http://biopython.org/DIST/biopython-1.61.win32-py2.7.exe](http://biopython.org/DIST/biopython-1.61.win32-py2.7.exe)
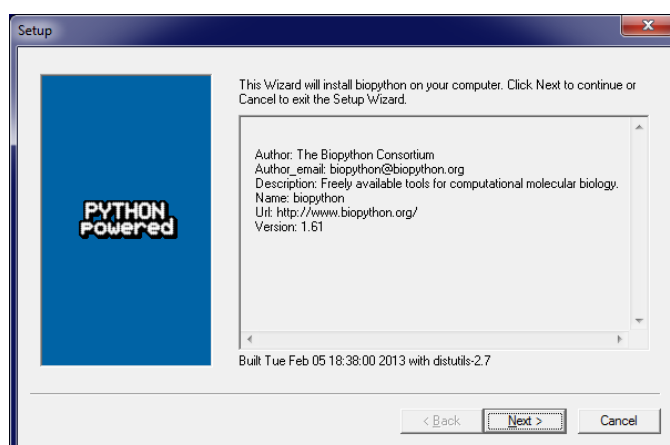Begin installing biopython:



*Figure 12:*

Python 2.7 should show up as the installed python version.
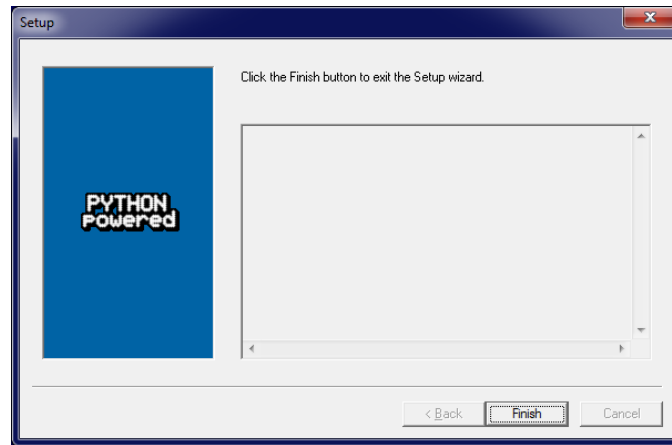Complete the installation by clicking on Finish.

*Figure 13:* Biopython has been successfully installed. **Click on Finish**

## Installation of blist

blist improves the performance of the Hamming distance and accumulation calculations. Download the blist addon from the link below:

https://pypi.python.org/packages/2.7/b/blist/blist-1.3.4.win32-py2.7.exe#md5=69b70f1311387e67bfba4bd2f38b2a32
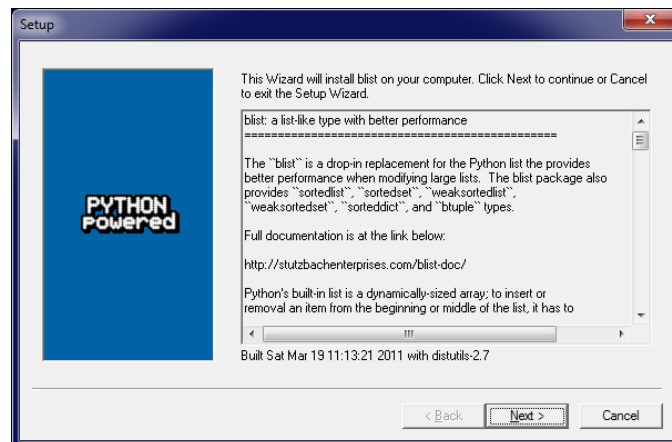
Select python 2.7 and click on Next



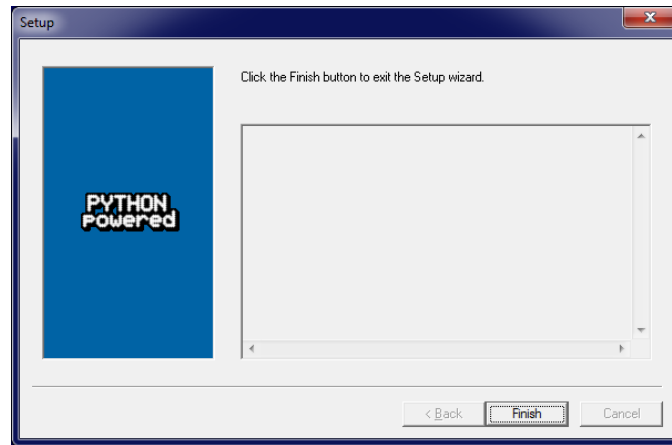*Figure 14:* Continue installation by clickicking on Next.

*Figure 15:* blist has been successfully installed.
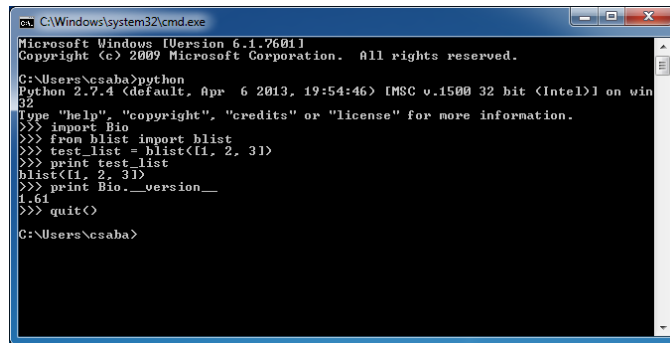**Click on Finish**.

## Testing of biopython and blist

Open a cmd window as previously shown in the test of python installation. Type the following lines exactly as it is shown below:

```
python
```

At the python command prompt type the following commands:

```
>>>import Bio
>>>from blist import blist
>>>test_list = blist([1, 2, 3])
>>>print test_list
blist([1, 2, 3])
>>>print Bio.__version__
1.61
>>>quit()
```

(Note: Bio. __version__ contains two underscore characters before and after the word 'version'.)
A similar window should be showing that both biopython and blist have been installed correctly.

*Figure 16: Testing of the installation of biopython and blist.*

## Mac OSX platform OSX 10.8.3

The installation will be demonstrated on a fresh installation of Mac OSX 10.8.3. Python 2.7 is installed by default on Mac OSX. To check if it is working open a new terminal window (Applications → Utilitites → Terminal) and type

```
python
```

then

```
>>>quit()
```

You should get a similar screen below:



*Figure 17: the default python installation on Mac OSX 10.3.8*

## GCC installation

Mac OSX 10.3.8 does not come with a gcc compiler by default. If you don't have Xcode installed a good alternative is a GCC-10.7. You can download load the installation package from here:

https://github.com/downloads/kennethreitz/osx-gcc-installer/GCC-10.7-v2.pkg

In order to install you need to enable the installation of downloaded applications. System Preference → Security & Privacy → **Click on Anywhere** in the bottom part of the window after unlocking the settings by **clicking on the lock** in the bottom left corner and entering your administrative password:



*Figure 18:* Security settings for allowing the installation of downloaded software

Install the GCC package with the default setting:

*Figure 19: Begin installation of GCC and **click on Continue***



*Figure 20:* **Click on Close** to complete the installation of GCC

You have installed GCC successfully:

## Installation of biopython and blist

Open a new terminal window (Applications → Utilities → Terminal) and type the two following lines:

```
sudo easy_install -U biopython
```

then

```
sudo easy_install -U blist
```

The installation should complete with some warnings.

## Testing the installation of all required software

Open a new terminal window (Applications → Utilities → Terminal) and type the  following lines:

```
python
```

At the python command prompt type the following commands:

```
>>>import Bio
>>>from blist import blist
>>>test_list = blist([1, 2, 3])
>>>print test_list
blist([1, 2, 3])
>>>print Bio.__version__
1.61
>>>quit()
```

You should see a similar window as below without error messages:
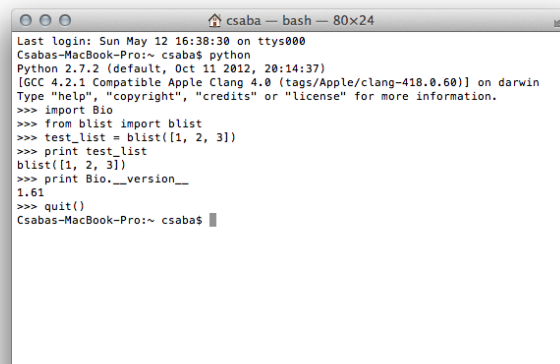


*Figure 21: : The required software has been successfully installed on Mac OSX 10.8.3*

## *Linux platform (Xubuntu 13.04)*

The required software linux installation will be demonstrated on a fresh installation of Xubuntu 13.04. Luckily, linux comes with python and gcc by default. Open a terminal window and type

```
python
>>>quit
```

A similar window should be on your screen:



*Figure 22:* The default python and gcc on Ubuntu 13.04

Now type

```
sudo apt-get install python-biopython
```

Enter your administrative password and install the biopython package:

Biopython should be installed with all the other dependent packages, now type



*Figure 23:* The installation of biopython on Ubuntu

```
sudo apt-get install python-blist
```

blist should be installed:



*Figure 24:* blist has been installed on linux

# Test of the required software on linux

Open a new terminal window and type the following lines:

```
python
```

At the python command prompt type the following commands:

```
>>>import Bio
>>>from blist import blist
>>>print Bio.__version__
1.60
>>>items = blist([1, 2, 3])
>>>print items
blist([1, 2, 3])
>>>quit()
```

You should see a similar window as below without error messages:



*Figure 25:* Ubuntu linux with the required software installed.

Your system is now ready for the installation of the AbMining ToolBox software package.