

# How To Install Python 3.10 On Debian 11

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Python is a high-level, object-oriented and multipurpose programming language that is extremely popular thanks to its simple and easy-to-learn syntax. It is widely used in various IT disciplines such as data analytics and visualization, web development, gaming development, AI, and machine learning. [Python 3.10](#) is the latest major and stable release and was released on October 04, 2021. Before we install Python 3.10 on Debian 11, let us have a preview of major features and enhancements that come with it.

1. Structural Pattern Matching Specification
2. Improved Error Reporting
3. Precise line numbers for debugging
4. offers parameter specification variables
5. Strict Arguments for zip function
6. Parenthesized Context Managers

In this article, we will demonstrate how to install Python 3.10 on Debian 11.

## Step 1: Install Dependencies

First off, install the essential dependencies required for building Python 3.10 from source as we shall later see.

```
$ sudo apt update
```

```
$ sudo apt install build-essential zlib1g-dev libncurses5-dev libgdbm-dev libns3-dev libssl-dev libreadline-dev libffi-dev libsqlite3-dev wget libbz2-dev
```

With all the dependencies in place, let's now download the latest Python version.

## Step 2: Download Python 3.10

Next, head over to the [Python 3.10 download page](#) . Here, you will find the latest features of the latest upgrade including the changelog, documentation, and source files for all computing platforms. Download the [Gzipped source tarball file](#) using the wget command as shown.

```
$ wget https://www.python.org/ftp/python/3.10.0/Python-3.10.0.tgz
```

Once the download of the tarball file is complete, proceed and extract it as shown.

```
$ tar -xvf Python-3.10.0.tgz
```

This will yield an uncompressed folder containing all the source code files required to build and install Python 3.10

## Step 3: Build and Install Python 3.10 on Debian 11

Now we are ready to install Python 3.10 on Debian 11. First, navigate into the python 3.10 directory.

```
$ cd Python-3.10.0
```

Then execute the `configure` command to confirm if all the dependencies for the installation of Python 3.10 are met.

```
$ sudo ./configure --enable-optimizations
```

```
cloudcone@debian-11:~/Python-3.10.0$  
cloudcone@debian-11:~/Python-3.10.0$  
cloudcone@debian-11:~/Python-3.10.0$ sudo ./configure --enable-optimizations  
checking build system type... x86_64-pc-linux-gnu  
checking host system type... x86_64-pc-linux-gnu  
checking for python3.10... no  
checking for python3... python3  
checking for --enable-universalsdk... no  
checking for --with-universal-archs... no  
checking MACHDEP... "linux"  
checking for gcc... gcc  
checking whether the C compiler works... yes  
checking for C compiler default output file name... a.out  
checking for suffix of executables...  
checking whether we are cross compiling... no  
checking for suffix of object files... o  
checking whether we are using the GNU C compiler... yes  
checking whether gcc accepts -g... yes  
checking for gcc option to accept ISO C89... none needed
```



The `--enable-optimizations` flag optimizes the Python binary and executes multiple tests. To start the build process. Execute the following `make` command. This takes quite a while, so be patient.

```
$ sudo make -j 2
```

The value `'2'` represents the number of CPU cores that can be confirmed using the `nproc` command. Adjust this value according to the number of CPU cores present on your system.

```
$ nproc
```

```
cloudcone@debian-11:~$  
cloudcone@debian-11:~$  
cloudcone@debian-11:~$ nproc  
2  
cloudcone@debian-11:~$  
cloudcone@debian-11:~$  
cloudcone@debian-11:~$
```

Finally, run the command below to install python binaries once the build process is complete:

```
$ sudo make altinstall
```

## Step 4: Verify Python 3.10 installation

Once the installation is complete, verify that python 3.10 is installed in your machine. Run:

```
$ python3.10 --version
```

```
cloudcone@debian-11:~$  
cloudcone@debian-11:~$  
cloudcone@debian-11:~$  
cloudcone@debian-11:~$ python3.10 --version  
Python 3.10.0  
cloudcone@debian-11:~$  
cloudcone@debian-11:~$  
cloudcone@debian-11:~$
```



The output confirms that we have been able to install Python 3.10 on Debian 11 Bullseye. As you have witnessed the installation is quite simple and straightforward. We hope that this guide was helpful.