

# Computing Laboratory

## Hands-on Python

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# 1 Fundamentals

## 2 Installation

### 3 The first Python program

# The Python interpreter

**Source code** → **(Python interpreter)** → **Executable**

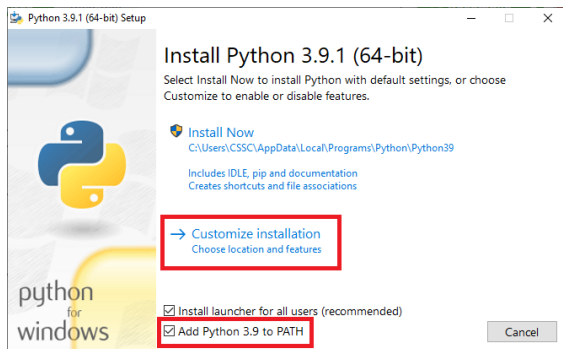
# Standard versions of Python

Significant Features	Python 2	Python 3
<code>print</code>	As a statement	As a function
<code>xrange()</code>	Yes	No
Returning lists	Yes	No
Returning iterable objects	No	Yes
Unicode	No	Yes
<code>byte</code> type	No	Yes
Exception handling with <code>as</code>	No	Yes
Integer division	Traditional	New

**Note:** Python 1 is no more in use and Python 2 is soon to be obsolete.

# Python installation – Version 3.9.1

**On Windows:** <https://www.python.org/downloads>



**On Linux:**

```
$ sudo apt-get update
```

```
$ sudo apt-get install <python_version> (e.g. python3.9.1)
```

```
$ python3 --version
```

# Installing/updating Python modules (i.e., packages)

## Installing a specific module:

```
python -m pip install <module> (e.g. math, pandas, numpy)
```

## Installing a specific version of module:

```
python -m pip install <module> == <version>
```

## Installing a specific module with a minimum version:

```
python -m pip install <module> >= <version>
```

## Updating a specific module:

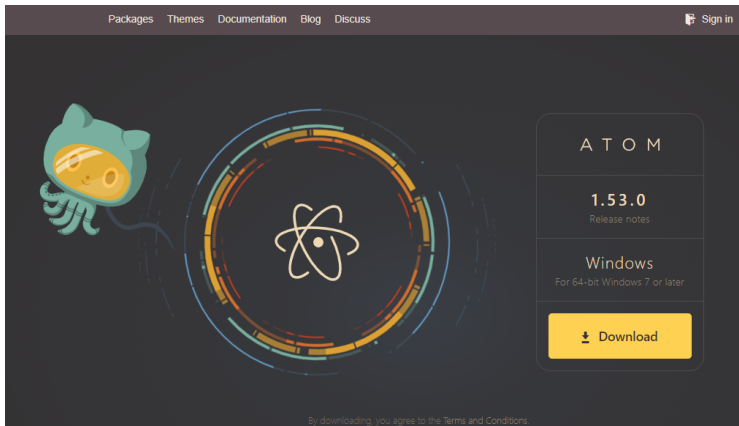
```
python -m pip install --upgrade <module>
```

**Note:** Installations/updates are to be done from the command prompt (not from the Python environment).

# Using Atom

Available at: <https://atom.io>

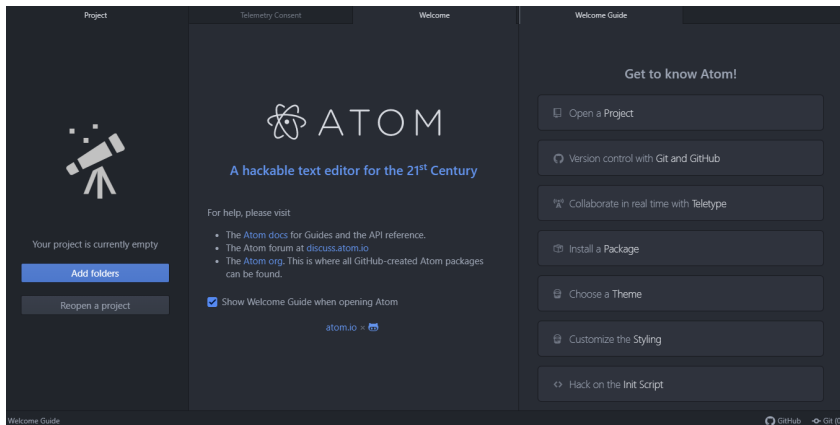
Installing Atom 1.53.0:



The screenshot shows the Atom 1.53.0 download page. At the top, there are navigation links: Packages, Themes, Documentation, Blog, and Discuss. A 'Sign in' button is in the top right corner. The main content area features the GitHub Octocat logo on the left, a large Atom logo in the center, and a download section on the right. The download section includes the text 'ATOM', the version '1.53.0', a link to 'Release notes', the operating system 'Windows', and a note 'For 64-bit Windows 7 or later'. A prominent yellow 'Download' button is at the bottom of this section. At the very bottom of the page, there is a small text line: 'By downloading, you agree to the Terms and Conditions.'

# Using Atom

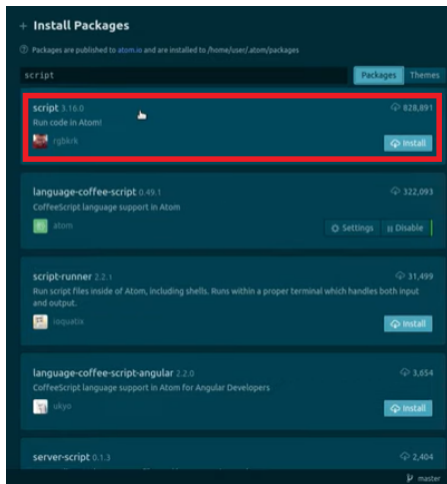
## Opening window of Atom 1.53.0:





# Running Python program on Atom

## Installing the Script package:









# Using Jupyter Notebook

Available at: <https://jupyter.org>

Open JupyterLab 1.0 in browser: <https://jupyter.org/try>

Try Classic Notebook:

<p>Try Classic Notebook</p>  <p>A tutorial introducing basic features of Jupyter notebooks and the IPython kernel using the classic Jupyter Notebook interface.</p>	<p>Try JupyterLab</p>  <p>JupyterLab is the new interface for Jupyter notebooks and is ready for general use. Give it a try!</p>	<p>Try Jupyter with Julia</p>  <p>A basic example of using Jupyter with Julia.</p>
<p>Try Jupyter with R</p>  <p>A basic example of using Jupyter with R.</p>	<p>Try Jupyter with C++</p>  <p>A basic example of using Jupyter with C++</p>	<p>Try Jupyter with Scheme</p>  <p>Explore the Calysto Scheme programming language, featuring integration with Python</p>

# Installing modules (i.e., packages) on Jupyter Notebook

## Installation in Jupyter shell:

```
!pip install <module> (e.g. xgboost)
```

## Installation in Jupyter kernel:

```
import sys  
!{sys.executable} -m pip install <module> (e.g. xgboost)
```

# The first Python program (in Python 3)

**Source: `Welcome2Python.py`**

# The first Python program (in Python 3)

**Source: Welcome2Python.py**

```
print("Welcome 2 Python")
```

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**Execution: Welcome2Python.py**

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Source: **Welcome2Python.py**

```
print("Welcome 2 Python")
```

Execution: **Welcome2Python.py**

Welcome 2 Python(cursor here!!!)

# Dissecting a code

```
# Import Statements
import math
# Function Definitions
def div(a, b):
    return a/b # Note the indentation
# Statements
var1 = 3
var2 = 2
# Functions
division = div(var1, var2) # Function call
print(division) # Prints 1.5
print(not (division > math.pi)) # Prints True
```



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**Note:** The program name can be anything.