**HISTORY AND LICENSE**

**HISTORY OF THE SOFTWARE**

Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see http://www.cwi.nl) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see http://www.cnri.reston.va.us) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see http://www.zope.org). In 2001, the Python Software Foundation (PSF, see http://www.python.org/psf/) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

All Python releases are Open Source (see http://www.opensource.org for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases.

**Release Derived Year Owner GPL-**

**from compatible?**

0.9.0 thru 1.2 n/a 1991-1995 CWI yes

1.3 thru 1.5.2 1.2 1995-1999 CNRI yes

1.6 1.5.2 2000 CNRI no

2.0 1.6 2000 BeOpen.com no

1.6.1 1.6 2001 CNRI no

2.1 2.0+1.6.1 2001 PSF no

2.0.1 2.0+1.6.1 2001 PSF yes

2.1.1 2.1+2.0.1 2001 PSF yes

2.1.2 2.1.1 2002 PSF yes

2.1.3 2.1.2 2002 PSF yes

2.2 and above 2.1.1 2001-now PSF yes

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Thanks to the many outside volunteers who have worked under Guido's direction to make these releases possible.

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This installer incorporates portions of the following third-party software:

OpenSSL 1.1.1k

Tcl 8.6.8

Tk 8.6.8

XZ 5.2.3

NCurses 5.9

SQLite 3.35.5

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**pandas** is a Python package that provides fast, flexible, and expressive data structures designed to make working with structured (tabular, multidimensional, potentially heterogeneous) and time series data both easy and intuitive. It aims to be the fundamental high-level building block for doing practical, **real world** data analysis in Python. Additionally, it has the broader goal of becoming **the most powerful and flexible open source data analysis / manipulation tool available in any language**. It is already well on its way toward this goal.

pandas is well suited for many different kinds of data:

* Tabular data with heterogeneously-typed columns, as in an SQL table or Excel spreadsheet
* Ordered and unordered (not necessarily fixed-frequency) time series data.
* Arbitrary matrix data (homogeneously typed or heterogeneous) with row and column labels
* Any other form of observational / statistical data sets. The data actually need not be labeled at all to be placed into a pandas data structure

The two primary data structures of pandas, Series (1-dimensional) and DataFrame (2-dimensional), handle the vast majority of typical use cases in finance, statistics, social science, and many areas of engineering. For R users, DataFrame provides everything that R's data.frame provides and much more. pandas is built on top of [NumPy](https://www.numpy.org) and is intended to integrate well within a scientific computing environment with many other 3rd party libraries.

Here are just a few of the things that pandas does well:

* Easy handling of **missing data** (represented as NaN) in floating point as well as non-floating point data
* Size mutability: columns can be **inserted and deleted** from DataFrame and higher dimensional objects
* Automatic and explicit **data alignment**: objects can be explicitly aligned to a set of labels, or the user can simply ignore the labels and let *Series*, *DataFrame*, etc. automatically align the data for you in computations
* Powerful, flexible **group by** functionality to perform split-apply-combine operations on data sets, for both aggregating and transforming data
* Make it **easy to convert** ragged, differently-indexed data in other Python and NumPy data structures into DataFrame objects
* Intelligent label-based **slicing**, **fancy indexing**, and **subsetting** of large data sets
* Intuitive **merging** and **joining** data sets
* Flexible **reshaping** and pivoting of data sets
* **Hierarchical** labeling of axes (possible to have multiple labels per tick)
* Robust IO tools for loading data from **flat files** (CSV and delimited), Excel files, databases, and saving / loading data from the ultrafast **HDF5 format**
* **Time series**-specific functionality: date range generation and frequency conversion, moving window statistics, date shifting and lagging.

Many of these principles are here to address the shortcomings frequently experienced using other languages / scientific research environments. For data scientists, working with data is typically divided into multiple stages: munging and cleaning data, analyzing / modeling it, then organizing the results of the analysis into a form suitable for plotting or tabular display. pandas is the ideal tool for all of these tasks.