python™

a programming language changes the world

Preview

Case Studies & Success Stories

…introducing the new professional quality
PSF Python Brochure

Turbocharged

...introducing the new professional quality
PSF Python Brochure

> "Python is already very well known among developers and becoming increasingly popular as rapid development language of choice. We would like to extend this popularity to non-developers in industry, governments and science.
>
> The brochure project is intended to reach out to these people, by showing how wide-spread Python already is and how its efficiency and simplicity can make a major difference."

Marc-André Lemburg
PSF Board Member and Project Lead

Programming with Python

Software quality is the vital ingredient to success in industry and science. Ubiquitous IT systems control the business processes of the global economy. Increasingly powerful computers and sophisticated algorithms provide the platform for new scientific discoveries. And global communication is inconceivable without intelligent software.

Anyone who can go to market more quickly than their competitors with better and more creative software solutions will secure pole position in the race for customers and market share. Anyone who can write secure and reliable programs in a fraction of the time normally required and can respond instantly to new challenges will be the first to cross the finishing line.

The programming language of the agile era

Agility is the hallmark of our times and Python is the programming language of the agile era. The Python universal programming language is the turbocharger of the IT department. Compared with other modern programming languages such as Java or C, Python achieves superior results in significantly shorter timescales for a number of different reasons.

For example, Python is a very lean programming language. Python programs are a great deal shorter than code written in other modern programming languages. As a result, both development times and maintenance costs are drastically reduced. Less code means fewer errors, meaning the cost of identifying and eliminating these errors is also reduced.

A comprehensive standard library and thousands of additional libraries in the Python Package Index provide developers with high-quality solutions which they can simply integrate into their applications to meet virtually any requirement.

In this way, Python frees up vast resources, which can be earmarked for more productive use elsewhere.

The master key for system integration

Python offers unique benefits for system integration. On the one hand, there are huge numbers of Python libraries, with which virtually any third-party system can be integrated. On the other hand, the libraries of many other programming languages can also be used in Python.

Once they have been programmed, Python applications can run on all operating systems for which a Python interpreter exists, significantly reducing the cost of operating-system-specific applications.

The language that has changed everything

For over 20 years, Python has been used successfully throughout the world as a programming language in industry, in the service sector, and also in research and science to meet a wide range of different requirements. In this time, the language has changed many things.

The Python programming language is easy to learn. It has blurred the boundaries between users and developers.

Our Target Groups

CIOs
chief architects
scientists
programmers
teachers

lecturers
students
customers
clients
managers

The Web

Python Impresses Mozilla

The Mozilla Corporation, manufacturer of the Firefox web browser and Thunderbird e-mail client, is impressed with Python and uses the language for its web services. The addon.mozilla.org and support.mozilla.com websites and the Socorro crash-reporting system are based on Django and Python.

Firefox Sync Server

The Firefox Sync Server, which is used to synchronize bookmarks, browsing histories, passwords, and open tabs on different computers and mobile devices, was also written in Python.

Tarek Ziadé – *a member of the Mozilla Service Team, cites various reasons for the success..*

»The Python programming language supports many programming paradigms and can be put to productive use virtually anywhere. What's more, Python is not restricted to the web. For example, we also use Python for our packaging and build systems.

The Python ecosystem is very rich and well-developed. Our developers can incorporate existing libraries into their projects and only need to develop the new functions that they need.

Python's concise syntax is simple and yet highly productive. This means that new developers can very quickly get involved in our projects, even if they are not yet familiar with Python.«

```
>>> import success
```

The Less Code the Better

A task that requires an average of twenty lines of code in C and seven in Java can often be done with just one line in Python.

Powered by Python

In 1998, a small company from California, with the help of the
Python programming language, changed the way we search for
relevant information on the Internet. The company had an un-
usual-sounding name: Google.

Twelve years on, this name is valued at 160 billion US dollars, making it the most
expensive brand in the world. Thanks to its innovative products, Google has risen in
no time at all to its position as a market-leading online information provider.

*»Google's mission is to organize the world's information and make it universally
accessible and useful.«*

It is safe to assume that without Python, the World Wide Web would not exist in its
present form. Not only Google, but also many other companies and open-source
communities have changed the web, and with it our lives, using Python.

Tailor-made for
Web Application

The Python programming la
made to perform new tasks
Web. Virtually no other prog
has as many web framewor
oping powerful web applica
and application servers su
bogears, and Pylons have e
to implement new services
on the Internet quickly, sec

*»Python is fast enough for our s
to produce maintainable feature
with a minimum of developers.«*

Cuong Do – *Software Arch*

It is easy enough to work out wh
consisting of several thousand li
time can be saved in the develop
ce of Python programs. With eve
a possible source of error is also

Python Software Foundation

❝As chairman of the PSF I am happy to see the Foundation support
this effort to bring Python to the attention of a wider public.

Businesses need to understand how Python can lower their pro-
gramming and maintenance costs. Programmers need to under-
stand how well Python integrates with other languages. Politicians
need to understand the significance of open source to national
strategies for science and education.

I really hope that we can eventually have the brochure translated,
and include examples of Python use from all over the world.

**The Python Software Foundation would love your help in bringing
Python to a broad international community.**❞

Steve Holden
Chairman of the
Python Software Foundation

Featured topics

Web	**Aerospace**
Science	**Business**
Finance	**IT Infrastructure**
Industry	**Cloud Technology**
Education	**Film and Animation**

The Language of Science

In hardly any other field of application has Python been so quickly and enthusiastically embraced as in the sciences. The language's design complements the thinking of scientists. Python does not force them to think like computer scientists, but enables them to formulate scientific tasks quickly and efficiently as programmatic algorithms in Python.

Libraries for complex mathematical and statistical calculations, for data visualization in 2D and 3D, and for specific technical purposes equip scientists from all disciplines with powerful tools to achieve their goals more quickly.

Big Bang Experiment

Large Hadron Collider at CERN
Chasing the Higgs Boson with Python

It is the largest machine ever built: the Large Hadron Collider (LHC) at CERN. The ring-shaped particle accelerator has a circumference of 26.7 km.

With the LHC, physicists hope to finally determine the existence of the Higgs boson, an elementary particle predicted but not yet proven to exist by the Standard Model of particle physics. The particle, which gives mass to other particles, should be identified in the CMS particle detector.

The CMS (Compact Muon Solenoid) is one of the experiments at the LHC. The goal of the experiment is to answer a number of key unresolved questions in particle physics and in our understanding of the universe at large.

Managing petabytes of data

The detectors create an unprecedented amount of experimental data, in the range of multiple petabytes each year. The challenge of analyzing these results is not only about discovering new physics, but has also a social aspect: thousands of scientists around the world want to access and analyze these data concurrently. To make this possible, a distributed computing and data storage infrastructure was build up - the Worldwide LHC Computing Grid. More than 34 countries and more than 100 computing centers are involved in this project.

New tools needed to be written to handle the management of the data and the associated workflows and the language of choice for these is Python. "The large functionality available in Python's library in combination with the flexibility provided by the language itself was the main reason for the choice", says Dr. Andreas Pfeiffer, CMS. The full system is now up and running since the beginning of the data taking in late 2009 and has overall handled a few Peta

Configuring 13.000 parameters

As every physicist is interested in different data selections and computations, the C++ based analysis framework can be configured dynamically. A typical analysis setup contains over 13,000 configurable parameters. To help the physicists in choosing the proper parameter set, a domain specific configuration language was developed.

Soon it became apparent that the chosen configuration solution was too inflexible. Every functionality change came with a huge maintenance burden. Looking for alternatives, we decided to replace our domain specific language with Python and a lightweight C++/Python bridge.

Overall, the entire process from the strategy decision, an automated translation, up to the eventual deprecation of the old configuration language was finished in less than 6 months. This new system is in use since a few years now, and many problems we could not solve in the previous system, are now literally one-liners.

Swisscom IT Services Finance AG

Quantax Post-Trade Risk Management

Quantax addresses post-trade risk management for complex portfolios of financial instruments. It is currently used on bank trading floors and professional asset managers by customers in four countries.

»Python has a low technical and conceptual overhead, yet includes everything you need to build professional applications.«

Martin Gfeller – *Swisscom*

There are a number of applications in risk management domain; they are typically either Excel-based solutions at the low end, or solutions developed as complex, multi-layered client-server systems at the high-end, with very little in between.

Swisscom Finance Services, a provider of professional consulting and expert implementations of IT solutions in the financial sector, decided to build Quantax from ground up as an object-oriented, web-based application, using technologies in which domain experts can express their expertise directly. Python excels in low techni-

cal overhead and is therefore used as the sole programming language in Quantax.

Quantax offers a broad coverage of financial instruments, ranging from shares to complex credit derivates and exotics, with real-time valuation, position keeping, and risk management. The Python environment and the Zope application server already include many components and are easily extensible with modules provided by the Python community and eco system. The total cost of ownership of Quantax therefore compares very favorably with its high-end competitors.

```
>>> import success
```

Security

Python is a highly stable and secure programming language.

By the end of 2011, only 125 security-related errors were detected in Python, one tenth of the errors in Java and a fraction of the possible security breaches detected to date in C.

Risk-free programming:
– No buffer overflows
– No buffer underruns
– No memory leaks
– No stack manipulations
– No memory management errors
– No access violations
– No segmentation faults

Taming bulls and bears

The world's stock markets can no longer survive without computers. Billions are traded every second in the electronic global networks. Complex, random calculations and simulations form the basis for buy and sell orders. Financial mathematicians like to use Python for this purpose.

Specialist libraries and Python-based applications provide them with all finance-related mathematical functions in an intuitive, comprehensible format. They can use powerful tools without having to worry about the numerous underlying programming parameters such as memory management, violations, and debugging.

Similar conditions prevail in the insurance sector. Actuaries use mathematical models to assess risks and calculate insurance premiums, all with Python.

Landesbank Baden-Württemberg

PyTAF Python - The Adapter Framework

Landesbank Baden-Württemberg (LBBW) is the central bank of the savings banks in Baden-Württemberg, Rhineland Palatinate and Saxony, with total assets of around EUR 374 billion (as of 31 December 2010).

LB≡BW
Landesbank Baden-Württemberg

In 1999, LBBW IT Financial Markets designed a new application integration architecture based on a message-oriented middleware layer and on asynchronous event-driven communications. In order to achieve the project objectives of a technical decoupling of applications, standardizing the implementation of interface programs and meeting the requirements of real-time straight-through-processing of financial markets trade data, a toolkit was needed.

As no vendor solutions fulfilled all of the key requirements the decision was taken to implement an integration framework in-house: PyTAF builds upon a simple model-driven development approach based on data flow graph-oriented development of programs in an interface editor GUI, generation of executable programs and a rich, extensible component library. PyTAF allows the developer to rapidly develop interface programs (adapters) using a wide range of connectivity and data transformation components.

Python has helped to enable PyTAF with its extensive standard library, its extensibility and its dynamic nature. Python is key to PyTAF's success. Since PyTAF went live in 2000 it has seen a steady increase in use, with over 100 PyTAF-based adapters in production today, processing millions of EUROs of trade data every day.

»There are lots of other programming languages with outstanding features. We don't know any other programming language with such features and a syntax as elegant and concise as Python, though.«

Holger Joukl, Manuela Kälberer, Rainer Kluger
Landesbank Baden-Württemberg IT Financial Markets

Due to the language design in Python, several classes of error cannot even occur in the first place. Python code, for example, cannot trigger buffer overflows, u... the permissibility of all Python i... As the program stack is not admi... but by the Python interpreter, sta... excluded. A garbage collector en... clearance of unused objects fror...

This is why Python has become the language of choice for security-conscious developers in many sensitive fields of application.
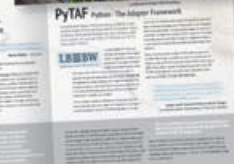
❝For me, working on the Python Brochure was a really interesting experience. Of course, I knew about the typical list of advantages people tell you when trying to sell Python. **What I didn't know was that Python has indeed changed the world.**

The success stories prove that Python has the potential to open up software engineering to a broader public, turning it into a skill that many people can learn and benefit from.❞

Jan Ulrich Hasecke
Editor

Sponsoring Options

You can support the PSF Python Brochure by buying ads or a reference entry in the brochure as well as pre-ordering copies for your own purpose.

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Case Studies & Success Stories

Turbocharged
Programming with Python

The Web

Powered by Python

Python Impresses Mozilla

Big Bang
Experiment

Chasing the Higgs Boson
with Python

Quantax Post Trade Risk Management

PyTAF Python - The Adapter Framework

Lift off with Python

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1/2

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http://www.python
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Always on the bright side

MyLogo

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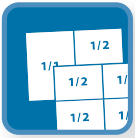
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The brochure will have 4 DIN A4 pages for ads. Ad sponsors can buy a **half page ad** in the first edition. Each ad sponsor will receive a box of around 120 free copies of the printed brochure after production.

There is room for 8 ad sponsors.

Reference sponsors

To help develop the business community around Python, we will have 2 pages of fixed-layout reference listings for interested companies. Reference sponsors can buy a **listing** in the first edition. The companies will get listed using their logo, a one line description of what they do, and their address details. Each reference sponsor will receive a box of around 120 free copies of the printed brochure after production.

There is room for 30-40 reference sponsors.

Subscription sponsors

You can pre-order additional copies in excess of the 10,000 copies we will have printed and distributed by the PSF. **You can use these copies for local distribution, marketing Python to your customers, at conferences and events.**

These sponsors will not get a listing in the brochure itself, but will help refinance the costs of producing the brochure and also help spread the word more widely.

We can ship world-wide. The costs for the subscriptions vary depending on the destination country. Please contact for more detailed information and other destinations.

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Sponsor educational institutions by having the PSF send subscription packages to universities and schools on your behalf. You can direct the PSF to send the packages to a specific institution or let the PSF select one from a list of interested instutions. Billing and payment will be handled by our producer *evenios publishing*.

Don't miss the chance to present your company in the first Python image brochure – space is limited !

http://brochure.getpython.info/
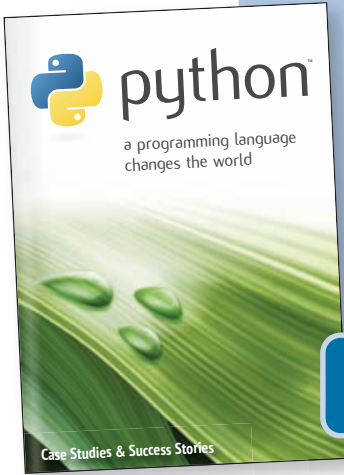
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Don't miss the chance to present your company in the first Python image brochure – space is limited !

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Case Studies & Success Stories

Please make sure to look at the project website for general information

Ad Guidelines
Media data for creative people & print professionals.

Reference Entry Guidelines
How to get listed in the Python brochure as Python support or service company.

Subscription & Education Sponsorship
How to order additional extra copies of the brochure for your company, university or event.

Media Data
Please visit our media data details pages regarding available ad sizes, ad and reference listing guidelines and ordering procedures.

About the PSF

python **SOFTWARE FOUNDATION**

The **Python Software Foundation (PSF)** *is a non-profit organization devoted to advancing Open Source technology related to the Python programming language. The PSF holds the intellectual property rights to Python and plans to fund portions of future development of the language. Additional information on the PSF is available at* **http://www.python.org/psf**. *To make a tax-deductible donation, please visit* **http://www.python.org/psf/donations.html**. *Corporate sponsorships are also being accepted.*