

Surat Python Users Group

Welcome Everyone!

15 February, 2020

www.meetup.com/surat-python-meetup-group



Today's topic

Introduction to an amazing world of Python!





Code of Conduct

- Be kind to others. Do not insult or put down others. Behave professionally. Remember that harassment and sexist, racist, or exclusionary jokes are not appropriate for the SPUG meetup.
- All communication should be appropriate for a professional audience including people of many different backgrounds. Sexual language and imagery is not appropriate.
- SPUG and ISF group of SVNIT is dedicated to providing a harassment-free community for everyone, regardless of gender, sexual orientation, gender identity and expression, disability, physical appearance, body size, race, or religion. We do not tolerate harassment of community members in any form.
- Thank you for helping make this a welcoming, friendly community for all.





What is Open Source?

According to wiki -

Open source products include permission to use the source code, design documents or content of the product.

It most commonly refers to the open-source model, in which open-source software or other products are released under an open-source license as part of the open-source-software movement.

Use of the term originated with software, but has expanded beyond the software sector to cover other open content and forms of open collaboration.





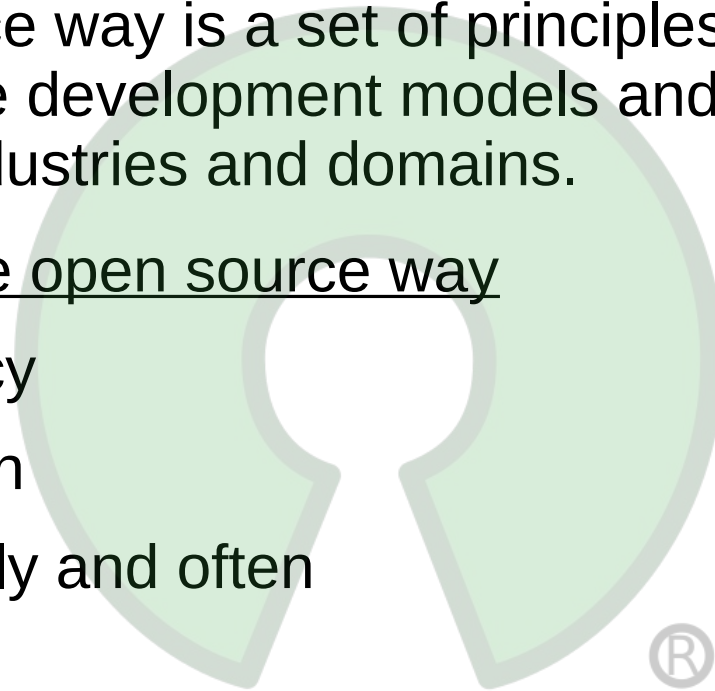
Open Source Way...

According to www.opensource.com -

The open source way is a set of principles derived from open source software development models and applied more broadly to additional industries and domains.

Principles of the open source way

- Transparency
- Collaboration
- Release early and often
- Meritocracy
- Community



What is Python?

According to wiki -

Python is an interpreted, high-level, general-purpose programming language created by Guido van Rossum and first released in 1991.

Python's design philosophy emphasizes code readability with its notable use of significant whitespace. Its language constructs and object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects.

Python is dynamically typed and garbage-collected. It supports multiple programming paradigms, including procedural, object-oriented, and functional programming. Python is often described as a "batteries included" language due to its comprehensive standard library.



Python Software Foundation

According to www.python.org -

The mission of the Python Software Foundation is to promote, protect, and advance the Python programming language, and to support and facilitate the growth of a diverse and international community of Python programmers





Application domains





















- Web and Internet development
- Scientific and Numeric computing
- Education, Research and Development
- Desktop GUIs
- Software development
- Business applications
- Data science / Machine learning / Deep learning
- Astrophysics
- Healthcare
- Plus many more...



Python is a number one...



According to www.spectrum.ieee.org -

Rank	Language	Type	Score
1	Python	  	100.0
2	Java	  	96.3
3	C	  	94.4
4	C++	  	87.5
5	R		81.5
6	JavaScript		79.4
7	C#	   	74.5
8	Matlab		70.6
9	Swift	 	69.1
10	Go	 	68.0



Who should learn Python?



- You are a student or a teacher or a professor
- You are in Science, Commerce or Art domain
- You are a Doctor or an Engineer or a Physicist or a Biologist or a Technician or a Researcher
- You are a musician or a Painter or a movie animator
- You are a web designer or an auto designer or an Architect
- You are a whole seller or a retail shop owner
- You are a product manager or a sales person or a marketing specialist
- You can be anyone...





Job market

- Check out Python job board at www.python.org
- Check out www.linkedin.com/jobs
- Check out www.indeed.com
- Check out www.monster.com
- Check out www.glassdoor.com
- Check out national job boards
- Check out local job boards
- Attend job fairs





The Zen of Python

>>> Import this

- Beautiful is better than ugly.
- Explicit is better than implicit.
- Simple is better than complex.
- Complex is better than complicated.
- Flat is better than nested.
- Sparse is better than dense.
- Readability counts.
- List continues...





Popular Python editors


Choice is yours -

- Popular text editors
 - IDLE, VIM, Sublime, Emacs
- Popular IDEs
 - VSCode, Atom, PyCharm, Spyder
- Popular data science tools
 - Ipython, Jupyter notebook
- Popular Python editor for kids/beginners
 - Mu, Thonny

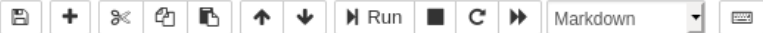



If you are in data science...




jupyter bayes_practice_12232019 Last Checkpoint: 12/23/2019 (autosaved)  Logout


File Edit View Insert Cell Kernel Widgets Help Trusted Python 3 





```
In [8]:  # split data
from sklearn.model_selection import train_test_split

In [9]:  # split dataset into train and test
X_train, X_test, y_train, y_test = train_test_split(wine.data, wine.target, test_size=0.3, random_state=8)


model generation


In [10]:  # import Gaussian Naive Bayes model
from sklearn.naive_bayes import GaussianNB

In [11]:  # create a classifier
gnb = GaussianNB()

In [12]:  # train the model using the training sets
gnb.fit(X_train, y_train)

Out[12]: GaussianNB(priors=None, var_smoothing=1e-09)

In [13]:  # predict the response for test dataset
y_pred = gnb.predict(X_test)

In [14]:  print(y_pred)

[0 2 1 0 1 1 2 0 1 2 1 1 1 0 1 2 1 0 0 1 2 1 0 1 2 2 0 2 0 1 1 2 0 1 1 2 0
 0 1 2 0 1 2 2 2 1 1 2 1 1 1 1 1 0]
```



Basic OS/Hardware requirements

Python is platform agnostic -

- Linux
- Windows
- Mac

Hardware requirements -

- Intel Atom or Intel core i3 processor
- 4 GB RAM (recommended)
- 40 GB disk space (recommended)



Install Python

- Depending on operating system -
Please use latest stable version, which is currently,
Python 3.8
<https://www.python.org/downloads/>
- Easy way, install Anaconda navigator from
<https://anaconda.org/anaconda/anaconda-navigator>





Hello world!

- It is as simple as writing in plain English
`print("Hello World!")`

A screenshot of the Visual Studio Code (VS Code) editor interface. The Explorer sidebar on the left shows a project named 'CHEESE_SHOP' with files 'hello_world.py', 'settings.json', and 'web_scraping_with_selenium...'. The main editor window displays the 'hello_world.py' file with a single line of code: `print("Hello World!")`, which is highlighted with a red box. The bottom panel shows the 'TERMINAL' tab with the command `python3 /home/sam/cheese_shop/.vscode/hello_world.py` executed, resulting in the output 'Hello World!', also highlighted with a red box. The terminal prompt is `sam@60mvi:~/cheese_shop$`.

```
File Edit Selection View Go Debug Terminal Help
EXPLORER
OPEN EDITORS
X hello_world.py .vscode
CHEESE_SHOP
.vscod
hello_world.py
settings.json
web_scraping_with_selenium...
hello_world.py x
.vscod > hello_world.py
1 print("Hello World!")
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
2: Python
sam@60mvi:~/cheese_shop$ /usr/bin/python3 /home/sam/cheese_shop/.vscode/hello_world.py
Hello World!
sam@60mvi:~/cheese_shop$
```





Popular Python libraries

According to www.github.com -

- Scikit-learn
- Flask
- Keras
- Sentry
- Django
- Ansible
- Tornado
- Pandas
- Matplotlib
- Zulip



Web development

- Django
- Flask
- FastAPI
- Pyramid
- Bottle
- Tornado



Data science

- numpy
- pandas
- matplotlib
- xarray
- dask
- datashader



Natural language processing

- Spacy
- Bert
- NLTK
- TextBlob
- gensim



Machine learning / Deep learning

- Scikit-learn
- Scikit-image
- Tensorflow
- Pytorch
- Keras
- openai/gym
- fastai



Robotics

- Robot Operating System (ROS)
- PyDy
- PyRobot
- RoboMaker





World of Electronics

- Microcontrollers
 - Adafruit Metro
 - ESP8266 and ESP32
- SBC
 - Raspberry Pi
 - Beaglebone black
 - Nvidia Jetson
- Programming language for micro-controllers
 - MicroPython
 - CircuitPython



Quantum mechanics

- Cirq
- QuTip
- Sympy
- ProjectQ



Black hole visualization

- A team lead by Katherine Louise Bouman, who also led the development of an algorithm for imaging black holes, known as Continuous High-resolution Image Reconstruction using Patch priors (CHIRP), and was a member of the Event Horizon Telescope team that captured the first image of a black hole
- Python libraries used -
astropy, ephem, future, h5py, html, ipython, matplotlib, networkx, numpy, pandas, pyfits, pynfft, requests, scipy, scikit-image



LIGO and Virgo gravitational wave detection

- PyCBC

PyCBC is a software package used to explore astrophysical sources of gravitational waves.

It contains algorithms that can detect coalescing compact binaries and measure the astrophysical parameters of detected sources. PyCBC was used in the first direct detection of gravitational waves by LIGO and is used in the ongoing analysis of LIGO and Virgo data.



Nobel Prize in Economics



Headline at www.qz.com reads following while announcing a Nobel prize winner in Economics for the year of 2018 -

“This year’s Nobel Prize in economics was awarded to a Python convert”

Economist Paul Romer, a co-winner of the 2018 Nobel Prize in economics, is many things.

“Instead of using Mathematica, Romer discovered that he could use a Jupyter notebook for sharing his research. Jupyter notebooks are web applications that allow programmers and researchers to share documents that include code, charts, equations, and data. Jupyter notebooks allow for code written in dozens of programming languages. For his research, Romer used Python—the most popular language for data science and statistics.”



A.M.Turing award recipients



- Turing award recipients of 2018 are avid Python users
 - Geoffrey E Hinton
 - Yoshua Bengio
 - Yann LeCun
- ACM named Yoshua Bengio, Geoffrey Hinton, and Yann LeCun recipients of the 2018 ACM A.M. Turing Award for conceptual and engineering breakthroughs that have made deep neural networks a critical component of computing.
- Bengio is Professor at the University of Montreal and Scientific Director at Mila, Quebec's Artificial Intelligence Institute; Hinton is VP and Engineering Fellow of Google, Chief Scientific Adviser of The Vector Institute, and University Professor Emeritus at the University of Toronto; and LeCun is Professor at New York University and VP and Chief AI Scientist at Facebook.



Python fuels top software programs

- Youtube
- Dropbox
- uber
- Google
- Quora
- Instagram
- Bittorrent
- Spotify
- Reddit
- disqus
- pinterest



Companies use Python

- Google
- Facebook
- Instagram
- JPMorgan Chase
- Capital one
- Slack
- Heroku
- Salesforce
- Amazon
- Many more...





Becoming a Pythonista

- Connect and collaborate
- Be open and transparent
- Do not hide your skills but share
- Contribute to open source libraries of your choice
- Help build Python community and spread awareness



Conferences and Development sprints



- Attend conferences like
 - Pycon India
 - PyData Delhi, PyData Mumbai, PyData Chennai
- Stay tuned for online development sprint announcement for open source software, they welcome all skill levels, this is usually in-person workshops, but sometimes online





Sky is not the limit...

- What will you do?
 - Learn Python
 - Teach Python
 - Contribute to Python
 - Build Python community
 - Spread Open Source awareness
 - Protect a common - Knowledge!



Please cleanup!

You are sitting in a borrowed space, if you make a mess, don't forget to cleanup



Provide feedback

- <https://www.meetup.com/Surat-Python-Meetup-Group/>
- Talk to us in social hour
- Participate in meetup discussions



Questions

You can ask questions in any of the following languages -

- English
- Hindi
- Gujarati



Thank you!

- Thank you all for participating!
- Thank you SVNIT Electronics Engineering Department for providing space.
- Thank you IFS SVNIT for providing wonderful support in making this event a success.

