PYTHON PROGRAMMING LANGUAGE AND JUPYTER

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OUTLOOK

- What is Python?
- Why Python is popular?
- Features of Python
- Jupiter Notebook
- Installing Anaconda Distribution
- Introduction to Python commands and syntaxes
- Useful resources for this course.

PYTHON PROGRAMMING LANGUAGE

- Python is a general-purpose programming language created by Guido Van Rossum in 1989
- Python is high level, interpreted language (in contrast to complied or machine level languages).
- It has easy syntax and dynamic semantics. It makes it easy for even a beginner.
- Due to the huge computing power that is available nowadays, the focus from speed in program execution is shifted to program readability and ease of development.
- It is an open-source language and thus free.
- It can be used to make almost everything. GUI, desktop, web, mobile, AI, and ML application are all supported.
- It has a huge library and a great supporting community.
- It is portable. It is operating system agnostic (OS, Win, Linux).
- It is an object-oriented language.

benevolent dictator for life until 2018

PYTHON SYNTAX VS C++

Python Code Example

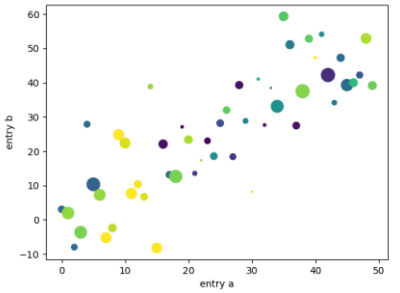
```
name = input()
print("Good evening, " + name)
```

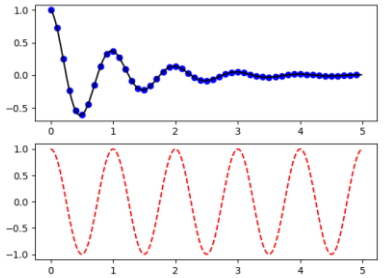
C++ Code Example

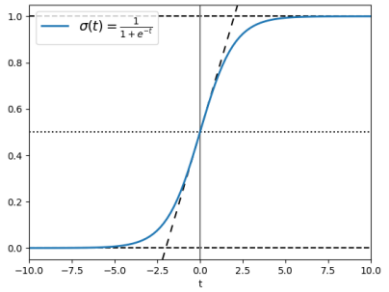
```
#include
#include
using namespace std;
int main() {
string name;
cin >> name;
cout << "Good evening, " << name << endl;
return 0;
}
```

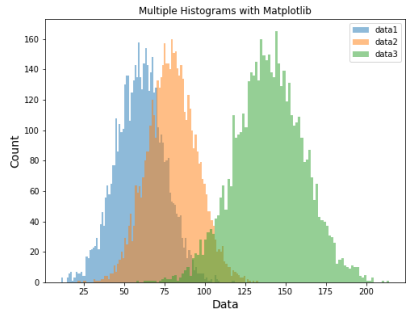
PYTHON AND MACHINE LEARNING

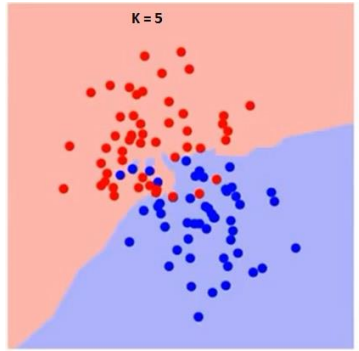
- Python has become a staple in data science
- It allows data scientists and other professionals to conduct complex statistical calculations, create data visualizations, build machine learning algorithms, manipulate and analyze data, and complete other data-related tasks.
- Python has a wide range of different data visualizations
  - line plots, bar graphs, scatter plots
  - Histograms, stem plots, stack plots
  - 3D plots, streamline plots, contour plots
- Python also has several libraries that enable coders to write programs for data analysis and machine learning more quickly and efficiently, like TensorFlow and Keras.

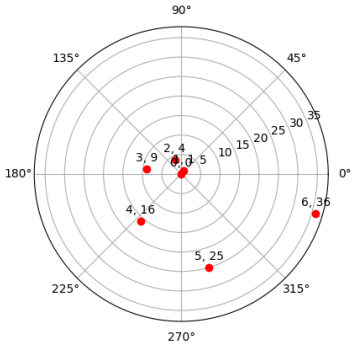










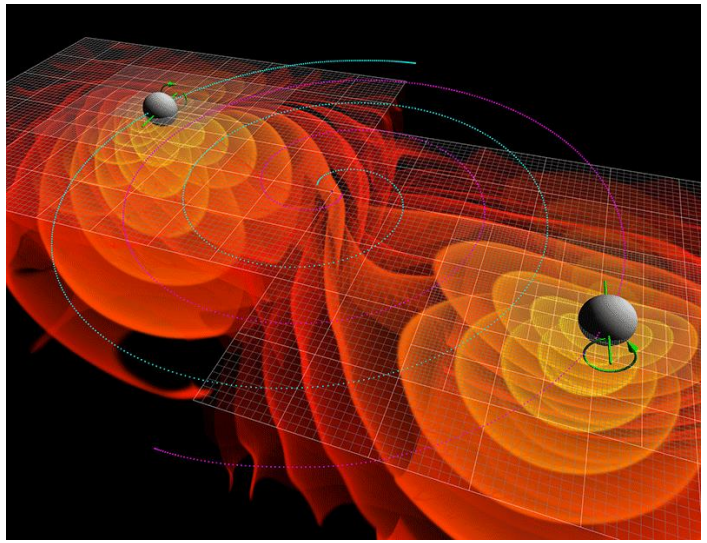


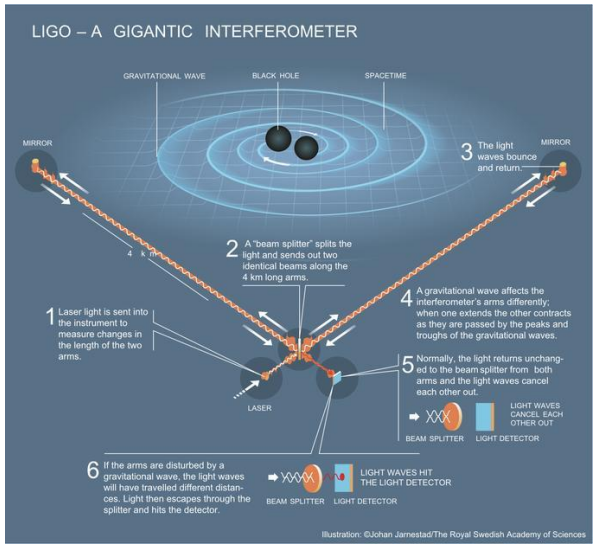
SOME IMPORTANT PACKAGES

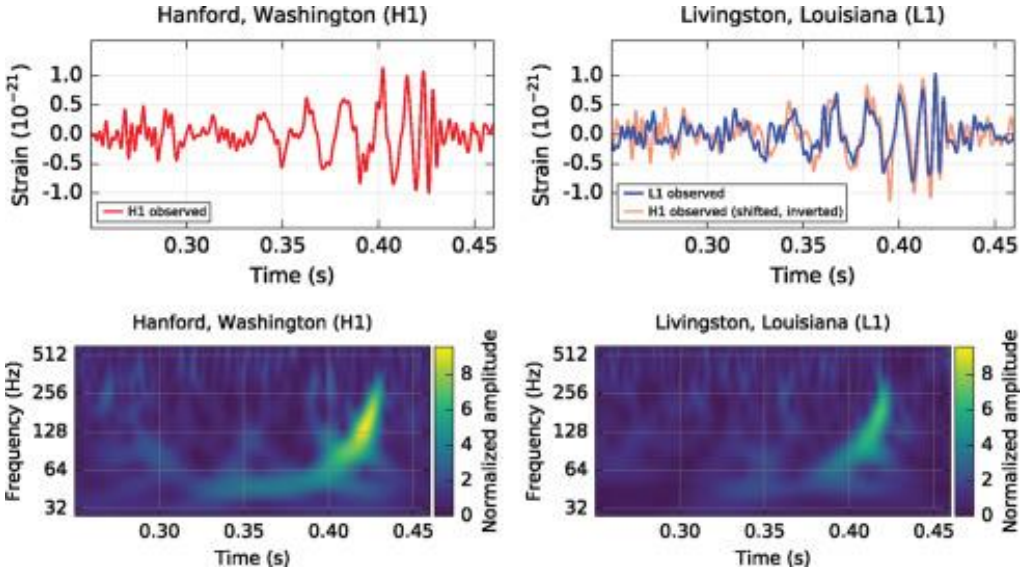
- NumPy
- Scikit-learn
- Pandas
- Matplotlib
- Seaborn
  - Seaborn is a library for making statistical graphics in Python. It builds on top of matplotlib and integrates closely with pandas' data structures.
  - internally perform the necessary semantic mapping and statistical aggregation
  - It lets you focus on what your data mean, rather than on the details of how to draw them

JUPYTER NOTEBOOK

- Jupyter Notebook, is a project to develop open-source software, open standards, and services for interactive computing.
- It was spun off from IPython in 2014 by Fernando Pérez and Brian Granger.
- It creates a rich environment for collaboration, and information sharing.
- It supports three core programming languages, R, Julia and Python.

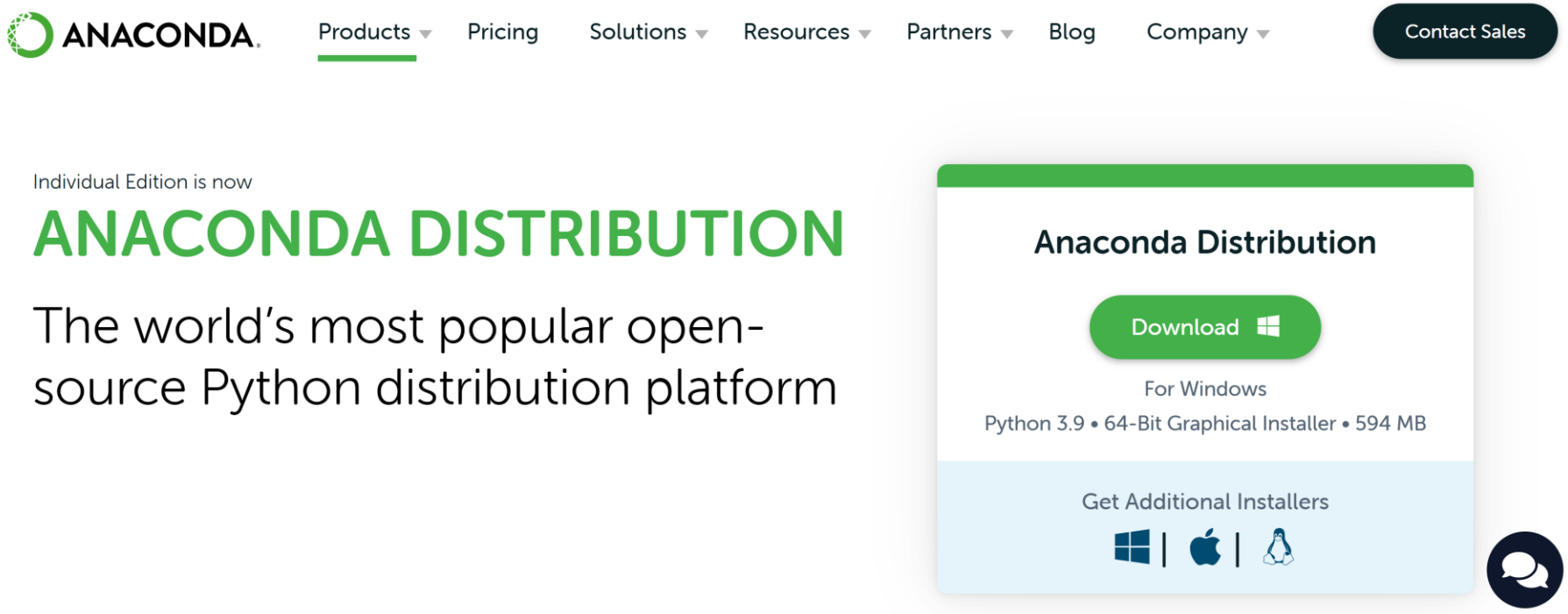




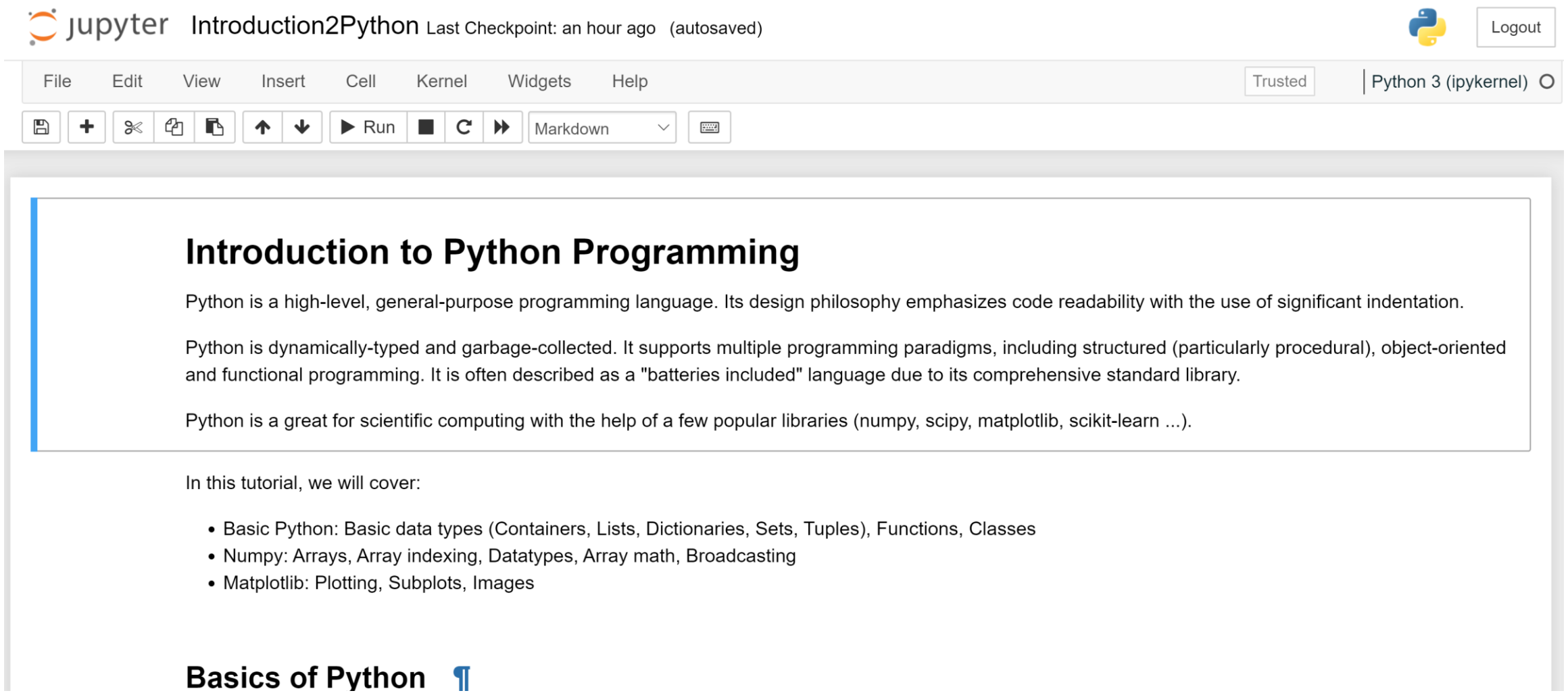


INSTALLING ANACONDA DISTRIBUTION

- Visit https://www.anaconda.com/products/distribution
- Go to Products. Select Anaconda Distribution: open-source repository & toolkit
- Use all recommended settings. For windows do not anaconda to the path list.



PYTHON COMMANDS AND SYNTAXES



USEFUL RESOURCES FOR MACHINE LEARNING

- Mitchell, T. M. (1997), *Machine learning* , Vol. 1 , McGraw-hill New York. http://www.cs.cmu.edu/~tom/mlbook.html
- Goodfellow, I.; Bengio, Y. & Courville, A. (2016), *Deep Learning* , MIT Press. https://www.deeplearningbook.org/
- Géron, A. (2017), *Hands-on machine learning with Scikit-Learn and TensorFlow : concepts, tools, and techniques to build intelligent systems* , O'Reilly Media , Sebastopol, CA .

USEFUL RESOURCES FOR PYTHON

- Python 3 Documentation Tutorial. https://docs.python.org/3/tutorial/index.html
- Google's Python Class. https://developers.google.com/edu/python/
- Some interesting cheat sheets:
  - Python: http://datasciencefree.com/python.pdf
  - NumPy: https://s3.amazonaws.com/dq-blog-files/numpy-cheat-sheet.pdf
  - Pandas: http://datasciencefree.com/pandas.pdf
  - Scikit-Learn: http://datacamp-community-prod.s3.amazonaws.com/eb807da5-dce5-4b97-a54d-74e89f14266b
  - Matplotlib: https://matplotlib.org/cheatsheets/cheatsheets.pdf
  - Seaborn: https://s3.amazonaws.com/assets.datacamp.com/blog_assets/Python_Seaborn_Cheat_Sheet.pdf
  - Create a GitHub account. There are plenty of useful Jupyter notebook for all these packages and more!