# Introduction to Python

GITAA
Transforming careers

# In this lecture

- Data science
- Tools for data science
- History of Python
- Python IDEs

# Introduction

- We live in a world that's drowning in data
- Data is generated from various sources
  - Websites track every user's every click
  - Your smartphone is building up a record of your location
  - Sensors from electronic devices record real time information
  - E-commerce websites collect purchasing habits

# Data science

- Interdisciplinary field that brings together computer science, statistics and mathematics to extract useful insights from data

- Analyzing and generating insights from data aids in arriving at better business decisions

# Popular tools used in data science

- Data pre-processing and analysis
  - Python, R, Microsoft Excel, SAS, SPSS
- Data exploration and visualization
  - Tableau, Qlikview, Microsoft Excel
- Parallel and distributed computing incase of big data
  - Apache Spark, Apache Hadoop

# Evolution of Python

- Python was developed by Guido van Rossum in the late eighties at the 'National Research Institute for Mathematics and Computer Science' at Netherlands
- Python Editions
  - Python 1.0-1991,
  - Python 2.0- 2000
  - Python 3.0 - 2008 (Python 3.7 – latest)

# Advantages of using python

- Python has several features that make it well suited for data science

- Open source and community development
  - Developed under Open Source Initiative approved license making it free to use and distribute even commercially

# Advantages of using python

- Syntax used is simple to understand and code
- Libraries designed for specific data science tasks
- Combines well with majority of the cloud platform service providers

# Integrated development environment (IDE)

- Software application consisting of a cohesive unit of tools required for development
- Designed to simplify software development
- Utilities provided by IDEs include tools for managing, compiling, deploying and debugging software

# Features of IDE

- IDE should centralize three key tools that form the crux of software development
  - Source code editor
  - Compiler
  - Debugger
- Additional features
  - Syntax and error highlighting
  - Code completion
  - Version control

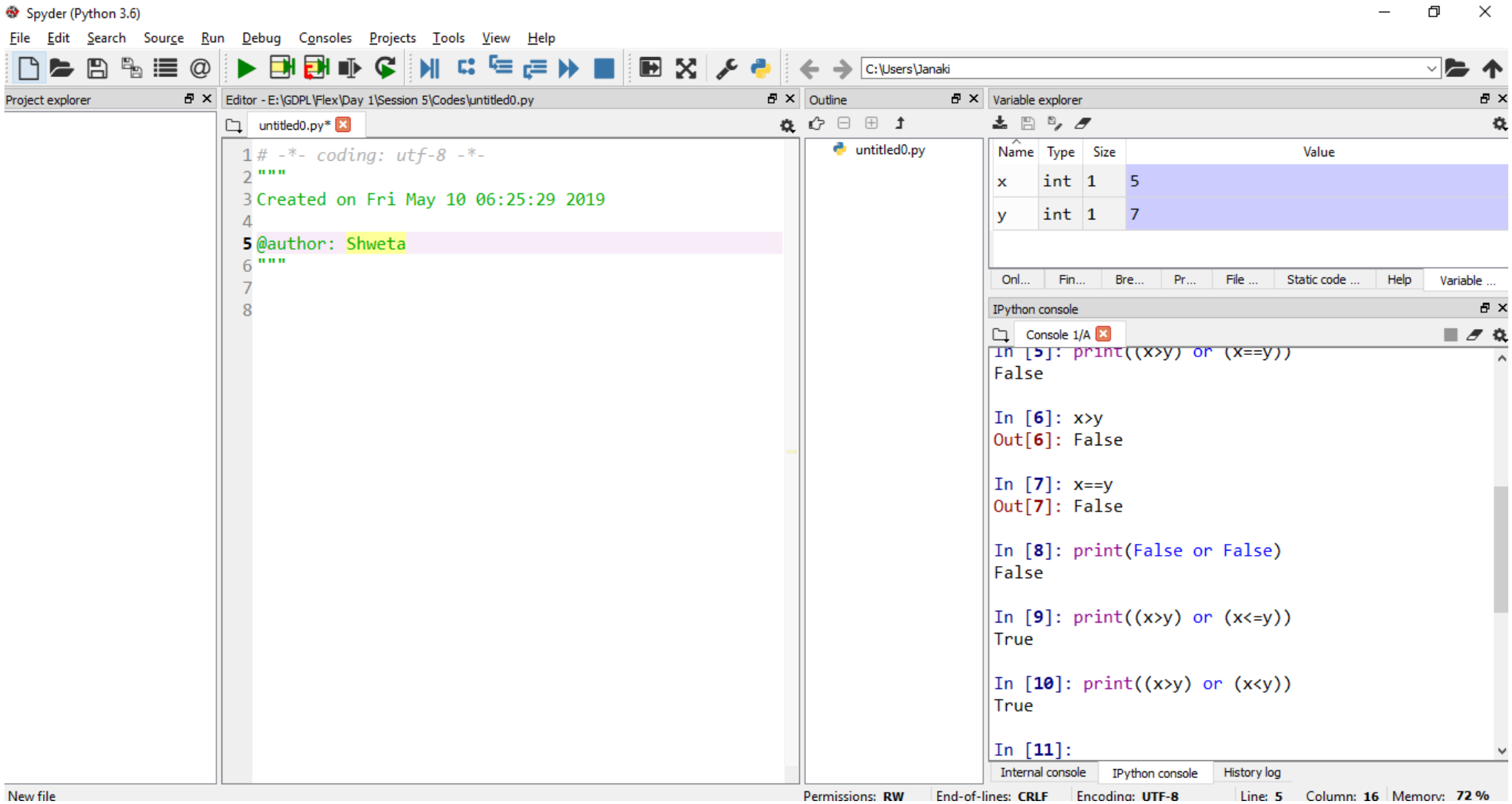
# Commonly used IDEs

- Spyder
- PyCharm
- Jupyter Notebook
- Atom

# Spyder

- Supported across Linux, Mac OS X and Windows platforms
- Available as open source version
- Bundled with Anaconda distribution which comes with all Python libraries
- Developed for Python and specifically data science

# Spyder


Spyder (Python 3.6)
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\Users\Janaki
Project explorer
Editor - E:\GDPL\Flex\Day 1\Session 5\Codes\untitled0.py
untitled0.py*
1 # -*- coding: utf-8 -*-
2 """
3 Created on Fri May 10 06:25:29 2019
4
5 @author: Shweta
6 """
7
8
Outline
untitled0.py
Variable explorer
Name Type Size Value
x int 1 5
y int 1 7
Onl... Fin... Bre... Pr... File ... Static code ... Help Variable ...
IPython console
Console 1/A
In [5]: print((x>y) or (x==y))
False
In [6]: x>y
Out[6]: False
In [7]: x==y
Out[7]: False
In [8]: print(False or False)
False
In [9]: print((x>y) or (x<=y))
True
In [10]: print((x>y) or (x<y))
True
In [11]:
Internal console IPython console History log
New file
Permissions: RW End-of-lines: CRLF Encoding: UTF-8 Line: 5 Column: 16 Memory: 72 %

# Spyder

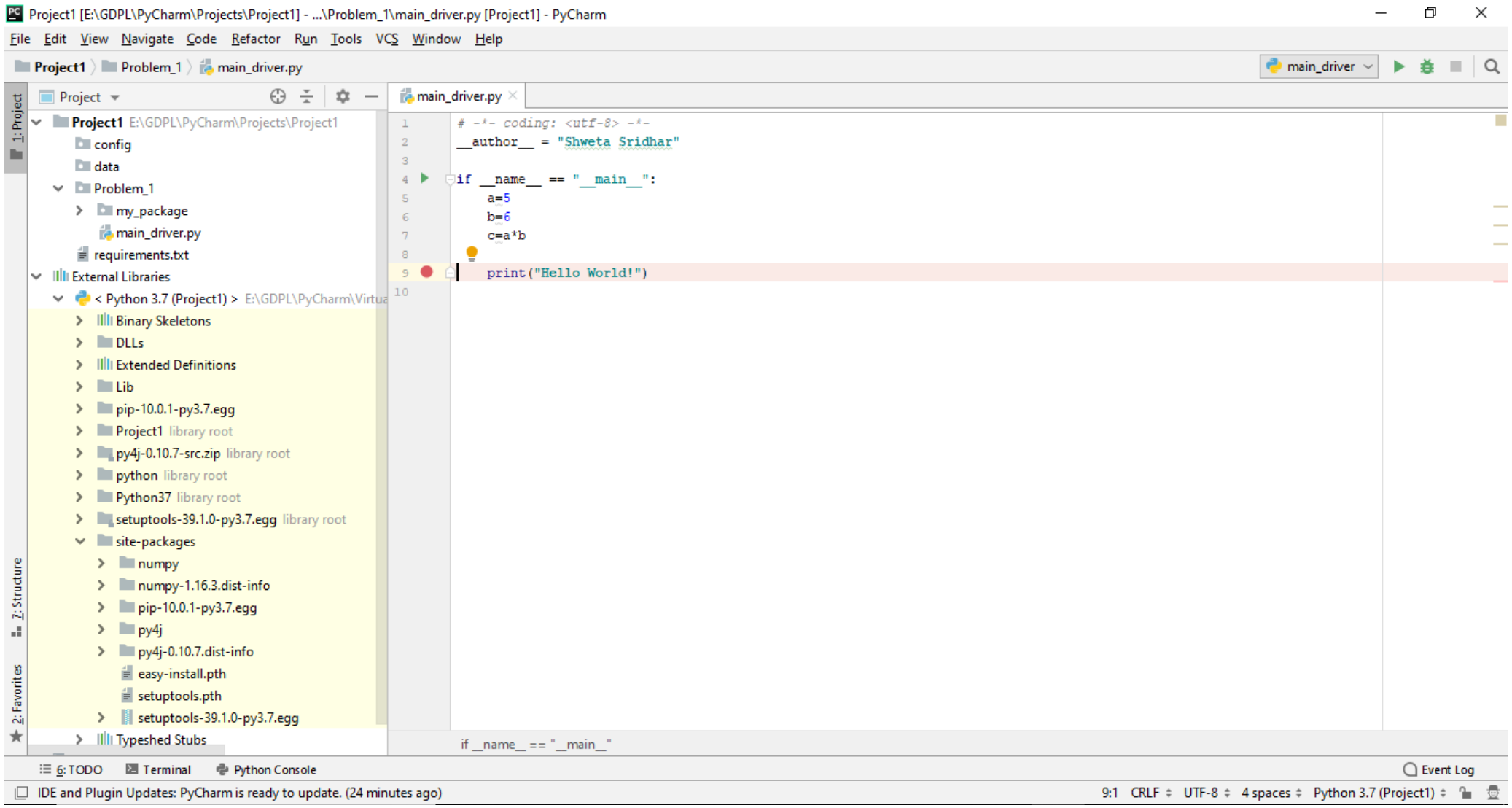
- Features include
  - Code editor with robust syntax and error highlighting
  - Code completion and navigation
  - Debugger
  - Integrated document

- Interface similar to MATLAB and RStudio

# PyCharm

- Supported across Linux, Mac OS X and Windows platforms
- Available as community (free open source) and professional (paid) version
- Supports only Python
- Bundled with Anaconda distribution which comes with all Python libraries
  - Can also be installed separately

# PyCharm


Project1 [E:\GDPL\PyCharm\Projects\Project1] - ...\Problem_1\main_driver.py [Project1] - PyCharm
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Project1 Problem_1 main_driver.py
main_driver
Project
Project1 E:\GDPL\PyCharm\Projects\Project1
config
data
Problem_1
my_package
main_driver.py
requirements.txt
External Libraries
< Python 3.7 (Project1) > E:\GDPL\PyCharm\Virtua
Binary Skeletons
DLLs
Extended Definitions
Lib
pip-10.0.1-py3.7.egg
Project1 library root
py4j-0.10.7-src.zip library root
python library root
Python37 library root
setuptools-39.1.0-py3.7.egg library root
site-packages
numpy
numpy-1.16.3.dist-info
pip-10.0.1-py3.7.egg
py4j
py4j-0.10.7.dist-info
easy-install.pth
setuptools.pth
setuptools-39.1.0-py3.7.egg
Typeshed Stubs
main_driver.py
# -*- coding: <utf-8> -*-
__author__ = "Shweta Sridhar"
if __name__ == "__main__":
a=5
b=6
c=a*b
print("Hello World!")
if __name__ == "__main__"
1: Project
2: Favorites
7: Structure
6: TODO
Terminal
Python Console
Event Log
IDE and Plugin Updates: PyCharm is ready to update. (24 minutes ago)
9:1 CRLF UTF-8 4 spaces Python 3.7 (Project1)

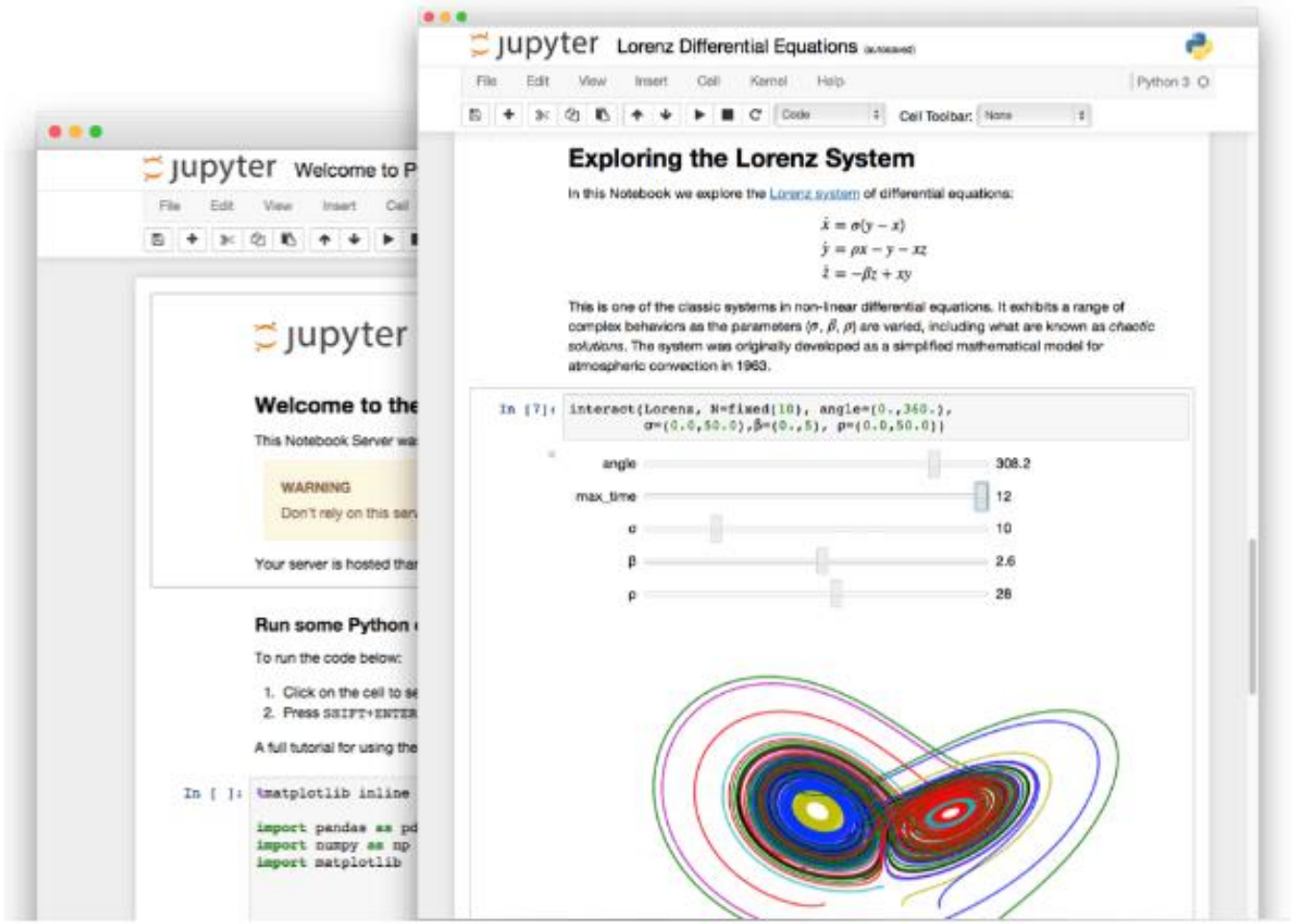
# PyCharm

- Features include
  - Code editor provides syntax and error highlighting
  - Code completion and navigation
  - Unit testing
  - Debugger
  - Version control

# Jupyter Notebook

- Web application that allows creation and manipulation of notebook documents called 'notebook'
- Supported across Linux, Mac OS X and Windows platforms
- Available as open source version

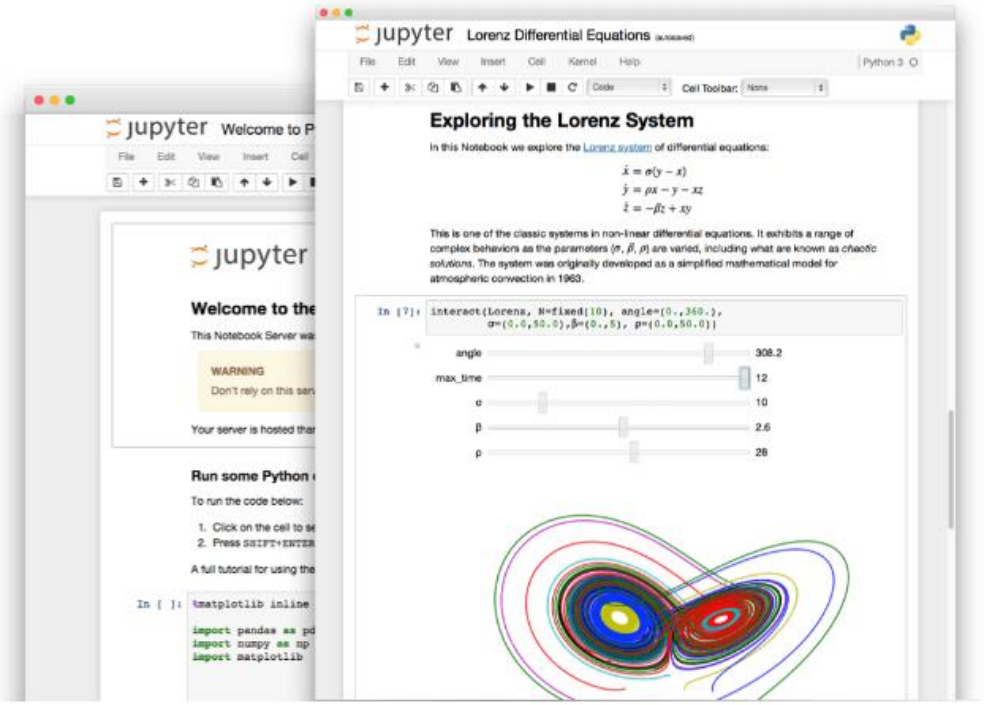
# Jupyter Notebook




**Source-https://jupyter.org/**

# Jupyter Notebook

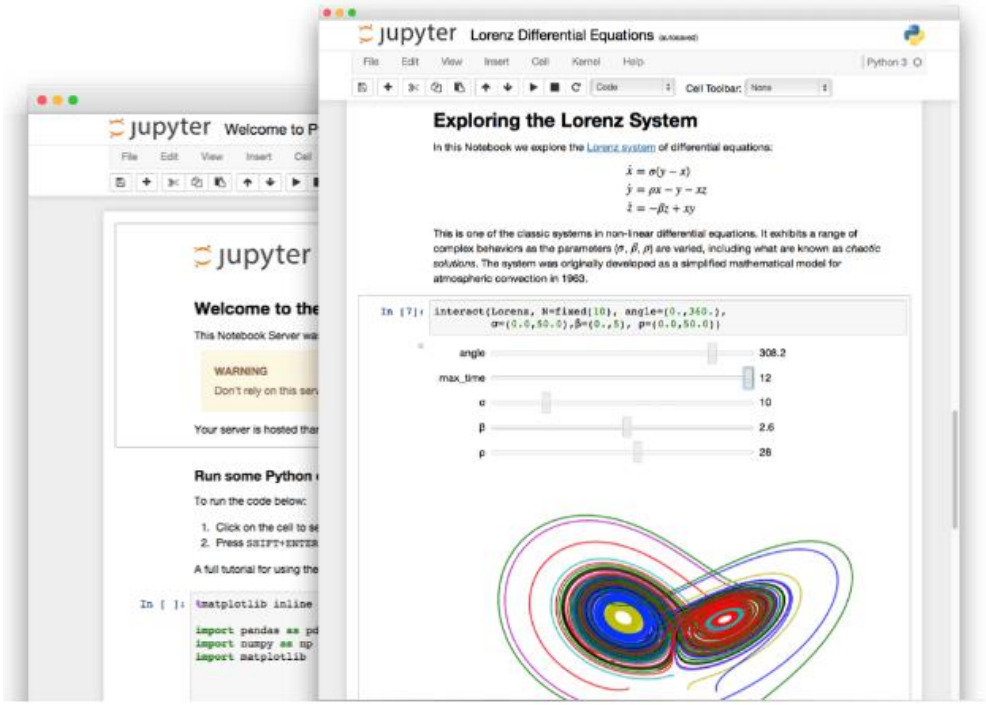
- Bundled with Anaconda distribution or can be installed separately
- Supports Julia, Python, R and Scala
- Consists of ordered collection of input and output cells that contain code, text, plots etc.




**Source-**https://jupyter.org/

# Jupyter Notebook

- Allows sharing of code and narrative text through output formats like PDF, HTML etc.
  - Education and presentation tool
- Lacks most of the features of a good IDE

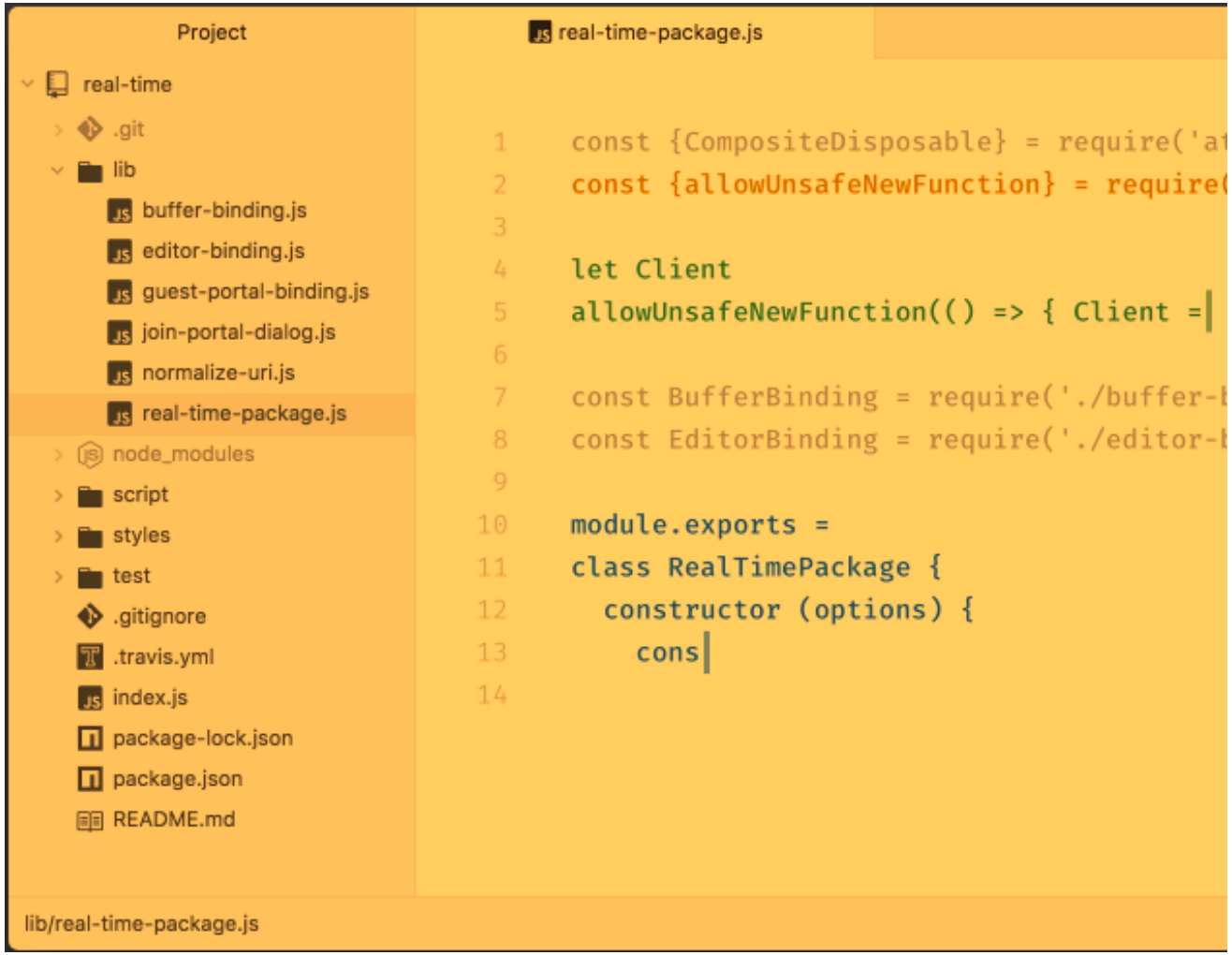



**Source-**https://jupyter.org/

# Atom

- Open source text and source code editor
- Supported across Linux, Mac OS X and Windows platforms
- Supports Python, PHP, Java etc.
- Well suited for developers
- Enables users to install plug ins or packages
  - Packages can be installed for code completion, debugging

# Atom




**Source-https://atom.io/**

# How to choose the best IDE?

- Requirements
- Working with different IDEs helps us understand our own requirement
- In this course, Spyder will be used

# Summary

- Popular tools used data science
- Evolution of Python
- Integrated development environment
  - Spyder
  - PyCharm
  - Jupyter Notebook
  - Atom


operation == "MIRROR_X":
irror_mod.use_x = True
irror_mod.use_y = False
irror_mod.use_z = False
operation == "MIRROR_Y":
irror_mod.use_x = False
irror_mod.use_y = True
irror_mod.use_z = False
operation == "MIRROR_Z":
irror_mod.use_x = False
irror_mod.use_y = False
irror_mod.use_z = True
selection at the end -add
_ob.select= 1
er_ob.select=1
ntext.scene.objects.acti
("Selected" + str(modifier
irror_ob.select = 0
bpy.context.selected_ob
ata.objects[one.name].se
int("please select exact

# THANK YOU