

# Using Python on Z

An Introduction into Big Data on Big Iron

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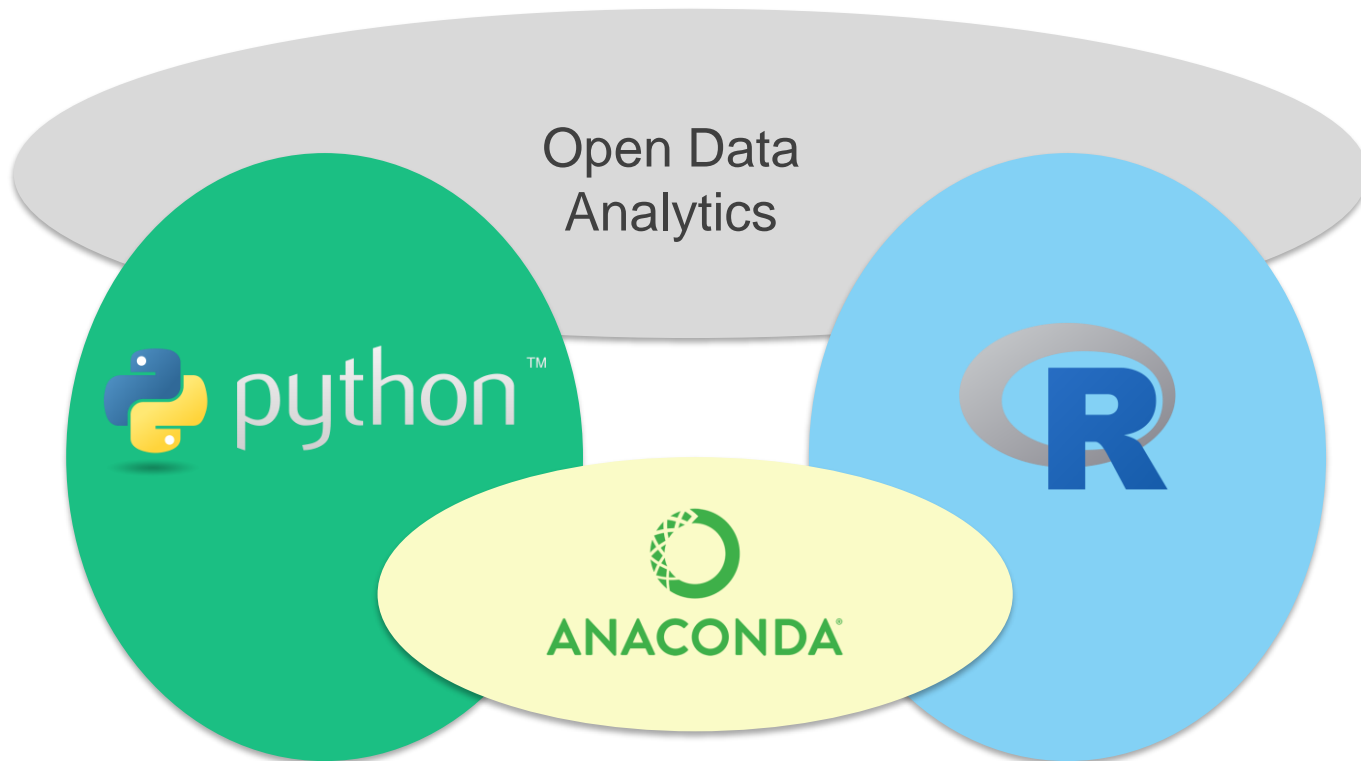
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# Python, Anaconda, and R



Python is best seen as part of a larger operational ecosystem

A large analytics ecosystem has been built around Python

- Python is used for lots of other non-analytics purposes



Anaconda is a package manager

- Installs and maintains the language and associated package libraries
- Anaconda also used to maintain the R language

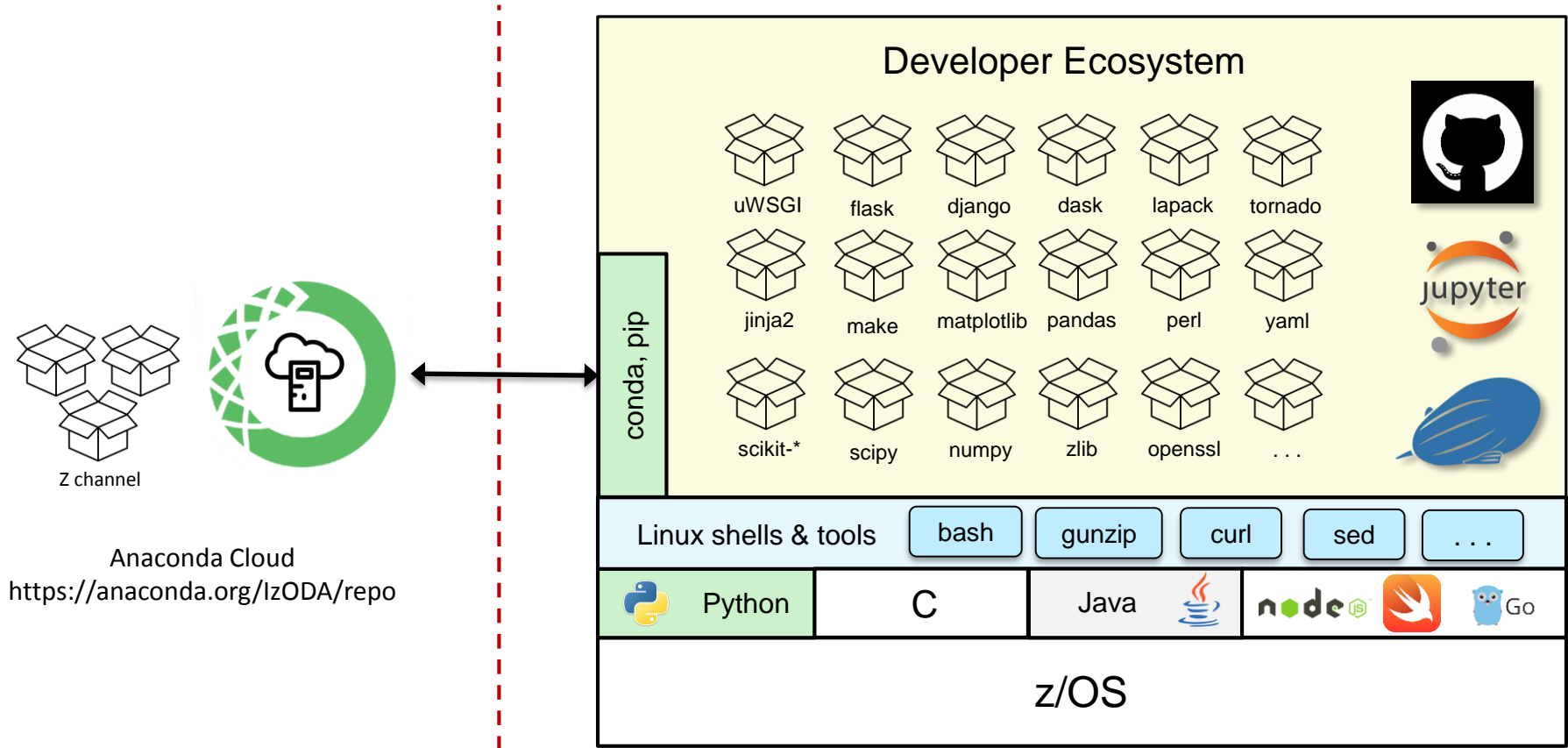


R is a functional language for primarily for data analytics

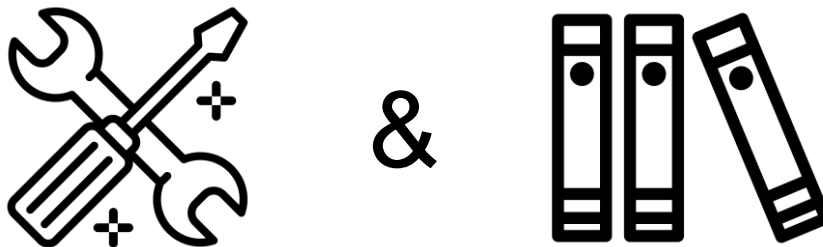
- R is currently being ported by Rocket Software



Python and Anaconda are part of *IBM Open Data Analytics for z/OS (IzODA)*



A package and environment management system + a library of infrastructure and data analytics packages



### Anaconda packages

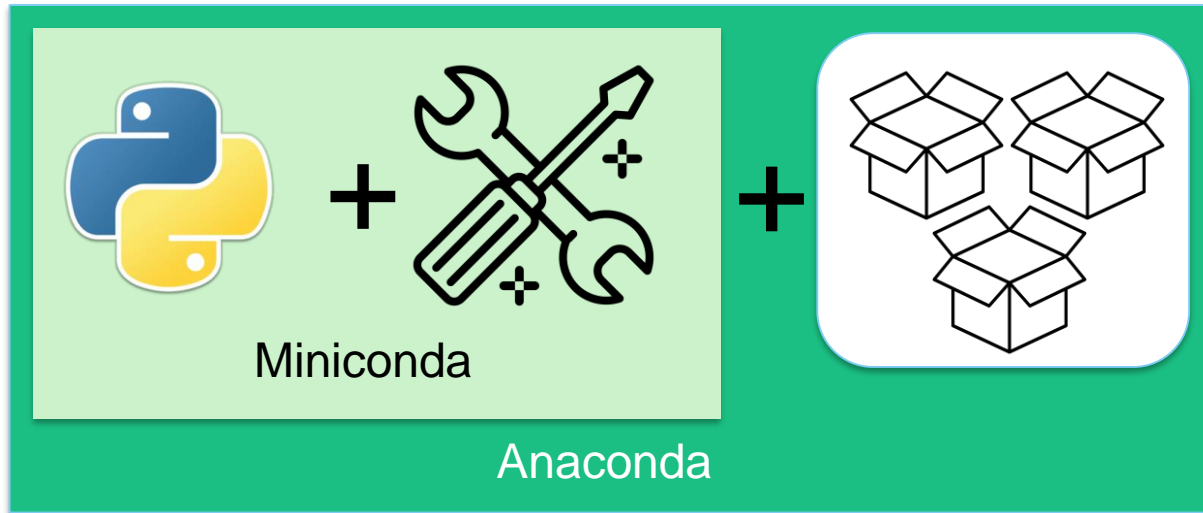
- Contain the deliverables of assorted open source projects
- Are assembled into **environments** that can be activated for specific runtimes
- May be installed from an Anaconda *channel* – either local or hosted at [anaconda.org](https://anaconda.org)

Anaconda supports the Python and R, but generalizes to other languages

Packages have Python or R interfaces by convention

Anaconda compliments the Python package installer (pip)

Miniconda is Anaconda without the package library



- **conda** command is the Miniconda package manager
- Conda is implemented in Python
- Python is managed as an Anaconda package

Conda environments are very heavily dependent on the runtime shell

- Environments are just carefully managed sets of paths and environment variables

The **B**ourne **A**gain **S**hell (bash) version 4.3 is the most current shell on z/OS, and is required by conda

- Like Python, bash is managed as an Anaconda package
- The default Korn shell (/bin/sh) is ancient, and doesn't support Anaconda

Anaconda happiness depends on a current shell





Anaconda is SMP/E installed by the system administrator as part of *IBM Open Data Analytics for z/OS*

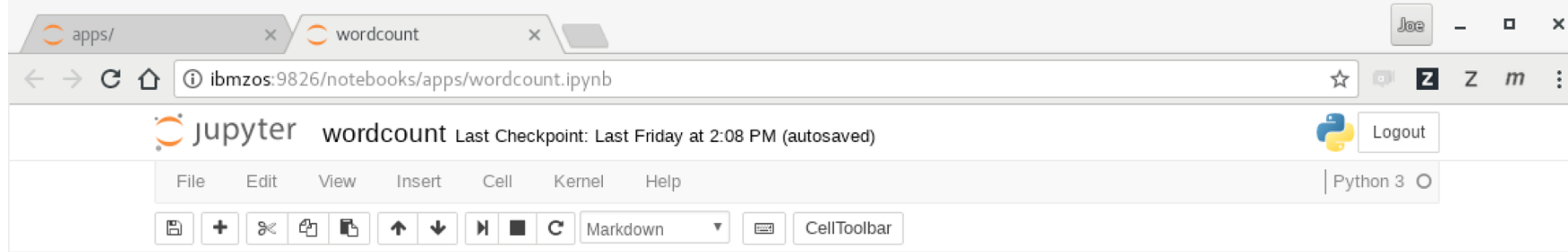
- conda + infrastructure and analytics packages
- Default installation path: `/usr/lpp/IBM/izoda/anaconda`
- Establishes the root/base environment for all users

Users create their own environments from the anaconda installation

- Packages come from either the local installation
  - `-c file:///usr/lpp/IBM/izoda/anaconda/channels/IzODA`
- Or from the IzODA anaconda channel (if enabled)
  - `-c izoda`
  - Results in a pull from <https://anaconda.org/IzODA/repo>







Jupyter == ***Julia*** + ***Python*** + ***R***

A browser-based developer's UI

Code is created in a notebook

- Can be divided into cells that run in an arbitrary order – enables rapid iteration
- Cells have rich functionality – text, executable code, data visualizations, video, ...

Supports multiple languages and runtime environments

- Runtime is implemented in a *kernel*

## IBM Open Data Analytics for z/OS

- <https://www.ibm.com/us-en/marketplace/open-data-analytics-for-zos>

## IBM Open Data Analytics for z/OS github pages

- <https://izoda.github.io/>

## Gain Analytics Agility on Apache Spark for IBM z Systems

- [https://www.youtube.com/watch?v=Y7HQBKBR\\_I4](https://www.youtube.com/watch?v=Y7HQBKBR_I4)

## Examples and demo applications

- <https://github.com/IzODA/examples>

## Demo Videos

- <https://youtu.be/QoAMx4nLHv8> (Anaconda and Python on z/OS)
- [https://youtu.be/M\\_5UA7rgYgw](https://youtu.be/M_5UA7rgYgw) (Client retention demo)
- <https://youtu.be/P4nbxdjJ7g8> (Payable transactions demo)