Data Science Lunch and Learn (11/9/2020)

# Automate your machine learning workflow tasks using Elyra and Kubeflow Pipelines

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# Center for Open Source Data & AI Technologies

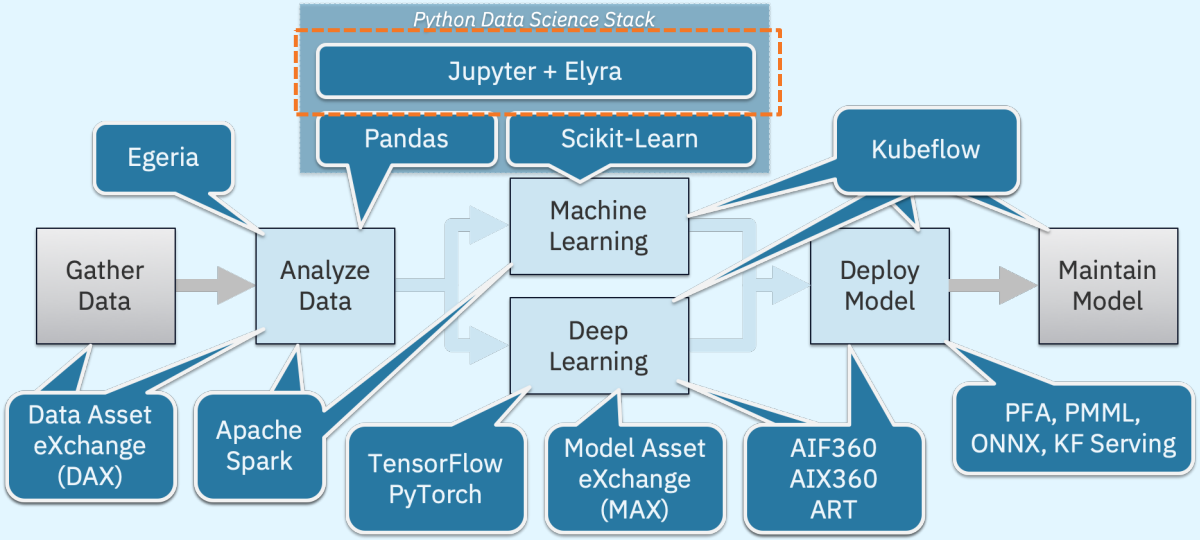
# CODAIT

**Open Source @ IBM**

codait.org

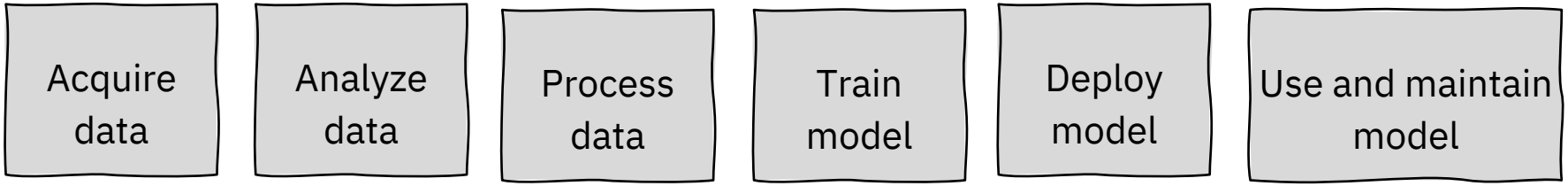
- CODAIT aims to make AI solutions dramatically easier to create, deploy, and manage in the enterprise.
- 40+ developers/data scientists
- We contribute to and advocate for the open-source technologies that are foundational to IBM's AI offerings.

Improving the Enterprise AI Lifecycle in Open Source

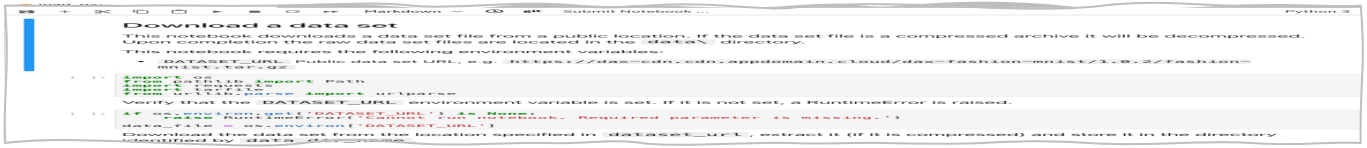


# Machine Learning (ML) Workflows

- Typical workflow tasks




- Many tasks comprise of sub-tasks and are performed iteratively
- Jupyter notebooks are frequently used

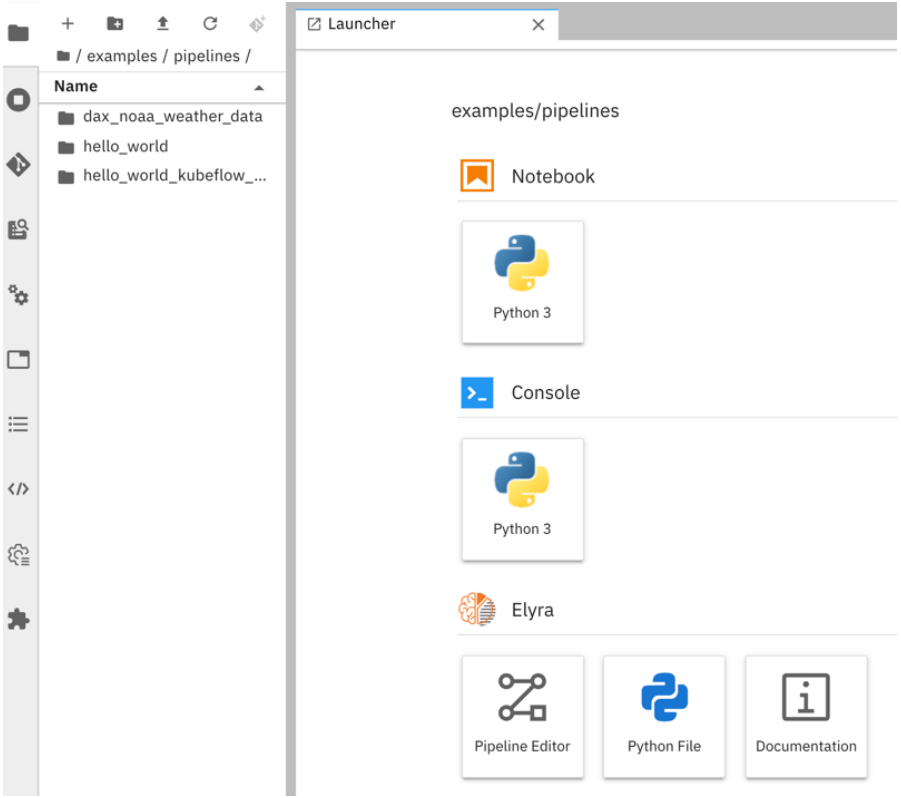


(monolithic – does many things)

(modular)

# Elyra:Set of AI-centric extensions to JupyterLab

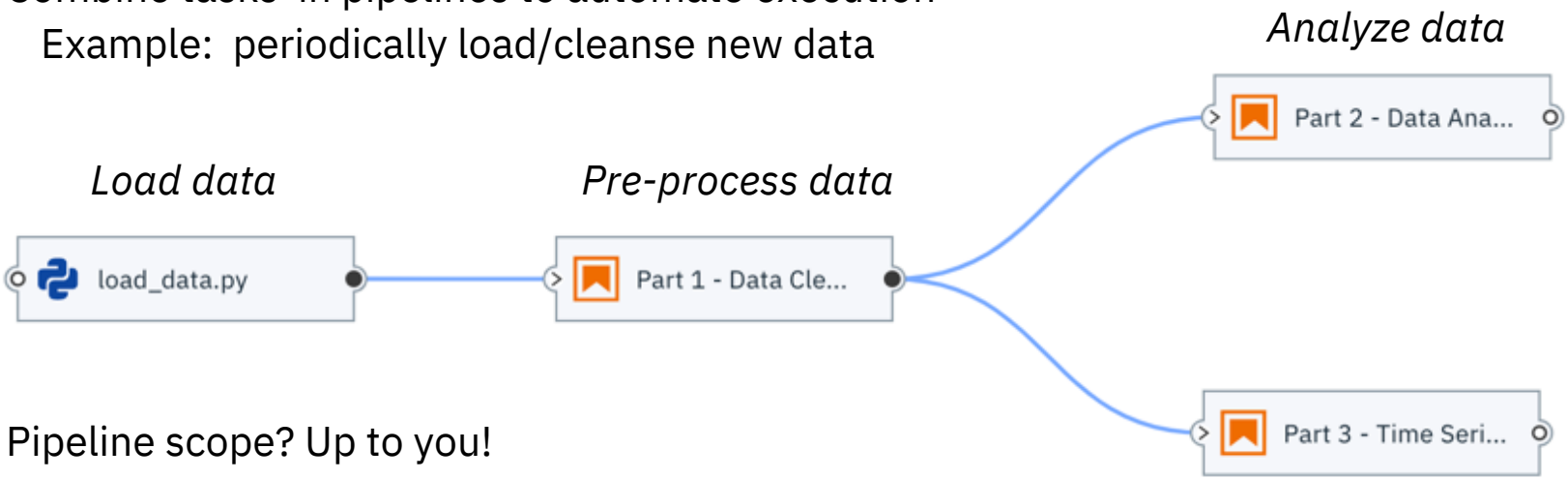
| | |
|---|---|
| re-use code | Code snippets |
| source control | Git integration |
| run remotely | Python scripts |
| run batch | Notebooks |
| ML workflow | Pipelines |



# Implementing ML Workflows Using Pipelines

- Modular notebooks (or Python scripts) allow for re-use in other projects
  - Example: load data from data source (database, cloud storage, ...)

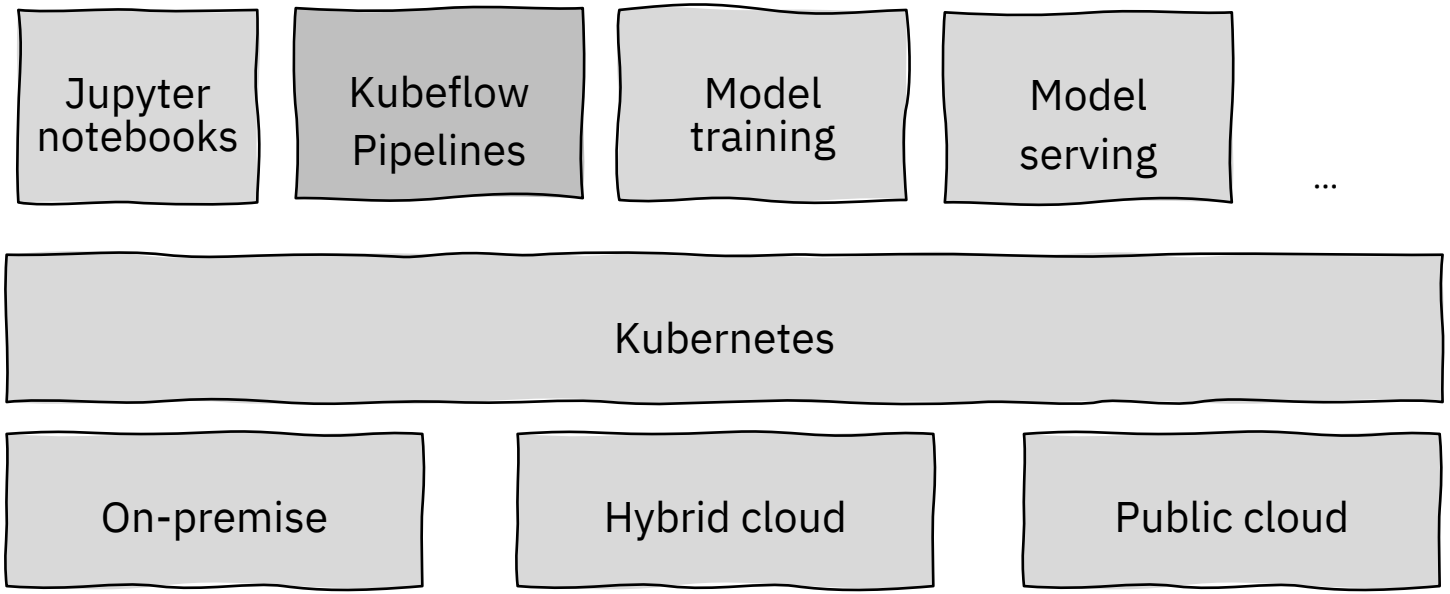
- Combine tasks in pipelines to automate execution
  - Example: periodically load/cleanse new data




- Pipeline scope? Up to you!

# Kubeflow in a Nutshell

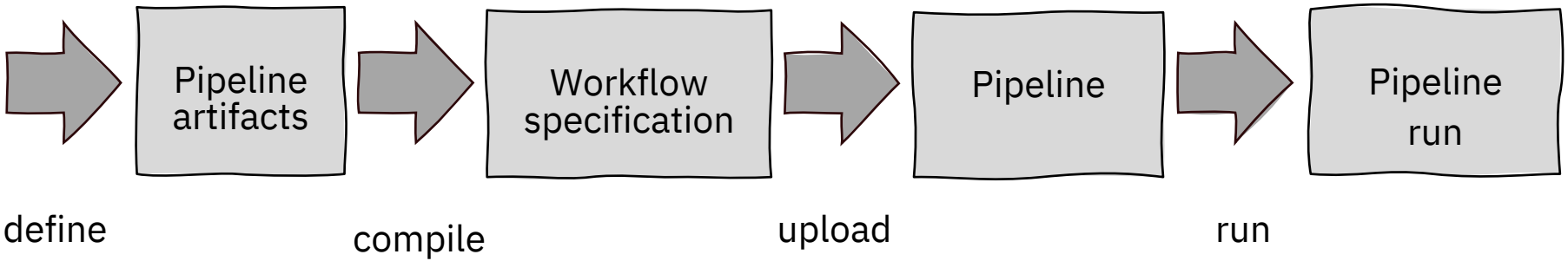
- Scalable, portable, distributed machine learning platform that runs on Kubernetes




- More info: https://www.kubeflow.org/

# Kubeflow Pipelines in a Nutshell

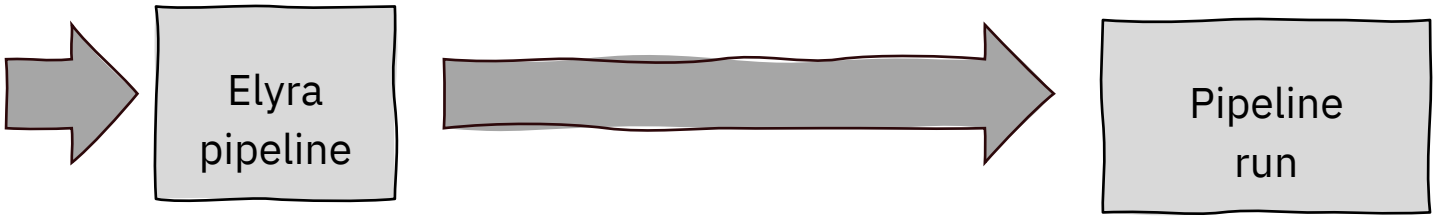
- Platform for building and deploying portable, scalable machine learning workflows
- SDK/ DSL Python is used to define pipeline artifacts




- More info: https://www.kubeflow.org/docs/pipelines/overview/pipelines-overview/

# Building Pipelines with Elyra

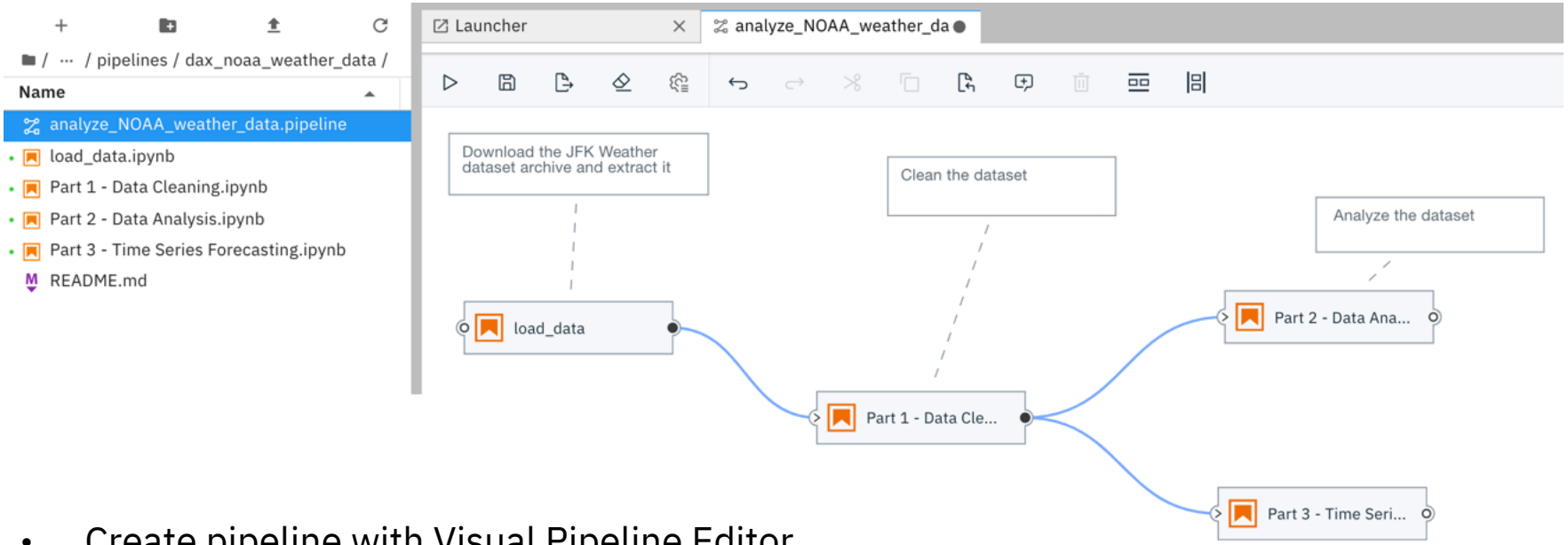
- Use Visual Pipeline Editor to assemble pipelines from notebooks or Python scripts




- Pipelines comprise of one or more [notebook/script] nodes

- Run pipelines
  - Locally in JupyterLab
  - On Kubeflow Pipelines (Elyra generates the required pipeline artifacts, uploads them, and starts a run

# Demo: Implementing an ML workflow using Elyra




- Create pipeline with Visual Pipeline Editor
- Run pipeline locally in JupyterLab
- Run pipeline on Kubeflow Pipelines
- Tutorials

# Getting Started with Elyra

Try Elyra on Binder

- No installation required - hosted on public cloud
- Nothing is persisted

Run Elyra in a Docker container

- Ready-to run images: `latest`, `x.y.z`, and `dev`

Install Elyra (requires Node.js and Python 3)

- `pip`, conda recipe, or from source code

https://elyra.readthedocs.io/en/latest/getting_started/installation.html

# Elyra Community, Next Steps, and Thank You!

- Elyra community
  - https://github.com/elyra-ai/elyra
  - Weekly community meetings
  - Reach out on gitter

- Additional pipelines
  - COVID-19 (https://github.com/CODAIT/covid-notebooks)
  - Airline delay analysis (coming soon)
  - AI fairness analysis (coming soon)

- Contacts
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