Up Your Bus Number

A Reproducible Data Science Workflow

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https://bit.ly/bus_number

Source: Speed (1994). Special Edition.
https://www.imdb.com/title/tt0111257/

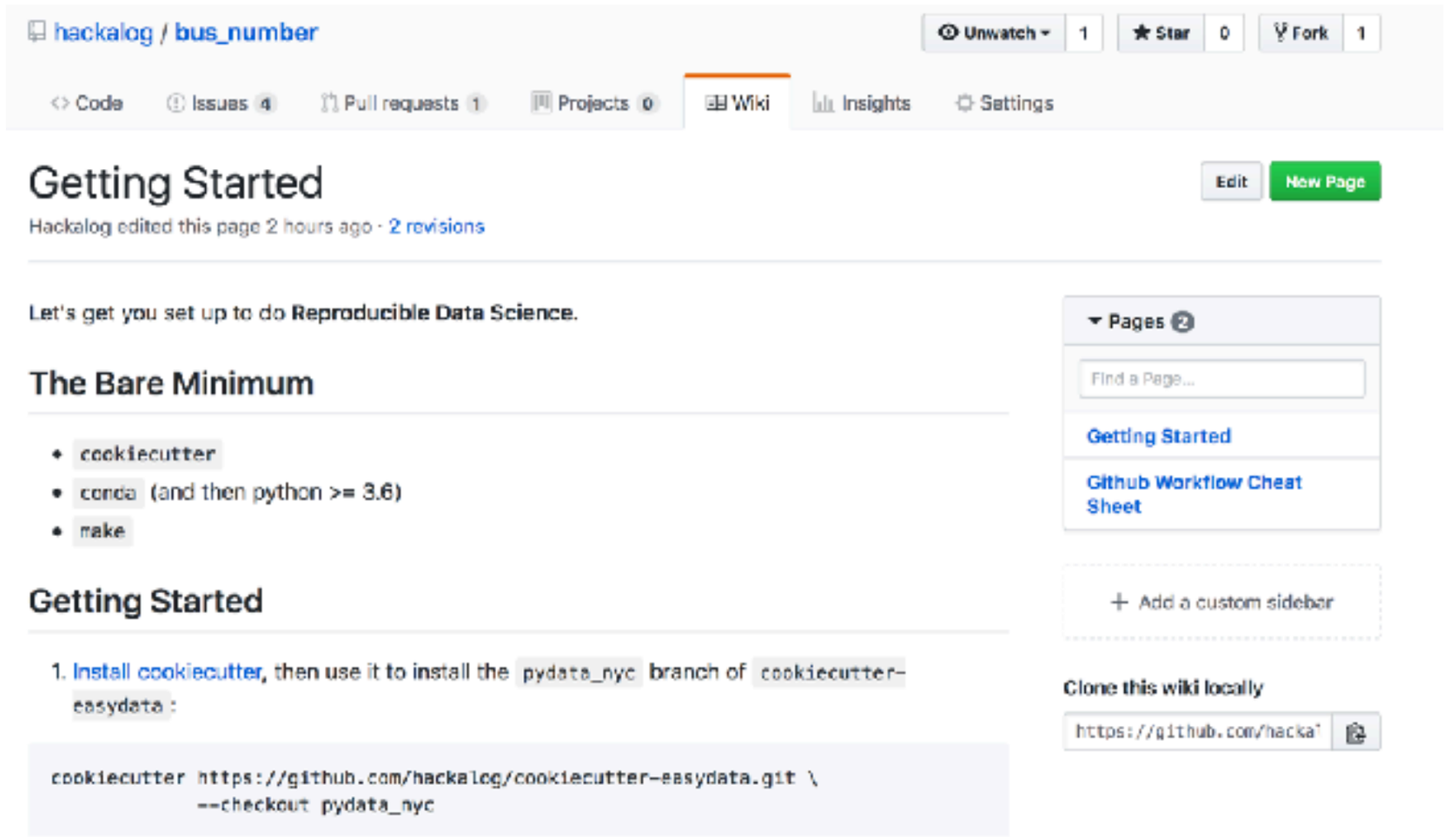
Bus Number:

The number of people who need to get hit by a bus before your data science project becomes *irreproducible*.

This might be **zero**.

While you wait...

https://bit.ly/bus_number_help



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Who Needs Reproducible Data Science?

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Meet Bjørn

- Bjørn is a dot-com millionaire. Currently he heads the Ikea R&D kitchen in Sweden.

- Bjørn employs a large number of Finnish line cooks. He can't understand a word they say.

- Bjørn needs a **trained model** to do real-time translation from Finnish to Swedish.

- Even though test kitchens have notoriously high turnover, reproducibility means Bjørn can ask his sous-chef to **deploy updated models** whenever needed.

Source: http://muppet.wikia.com/wiki/File:Swedish-chef.png

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Meet Mark

- Mark used to be an astronaut. After a rough year, he decided to change careers, and now works for a fashion magazine in NYC.

- Mark has to keep up with thousands of new fashions every week. More if it's Fashion Week.

- Mark wants to **publish a paper and software library** for accelerating fashion review using science.

- Reproducibility means his **peer reviewers** can reproduce his work, his paper will get accepted, his library will get pulled into scikit-learn, and he will transform the fashion industry forever.

Source: Youtube / 20th Century Fox

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Meet Annie

- Annie writes high frequency trading software. She moved to NYC after getting tired of the fast pace of life on the West Coast.

- Annie is constantly doing **EDA** on financial data in order to get that edge she can exploit for her firm.

- With thousands and thousands of analyses to sort through, there's no way Annie can remember everything she has done to her data.

- Reproducible data science gives Annie a way to **keep track** of the data she has worked with, the models she has built, and the experiments she has run, so that successful experiments can make it to the trading floor.

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Goal	Customer	Deliverables	Why Reproducible?
Exploratory Data Analysis	You	Intuition, knowledge, interactive widgets, reusable code	To help future you
Build, Deploy Models	Your Organization	Trained models, reliable metrics	Easy to update, easy to hand off
Publish or Share	Other (Data) Scientists	Paper, slides, code	Science without reproducibility is magic

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jupyter notebook

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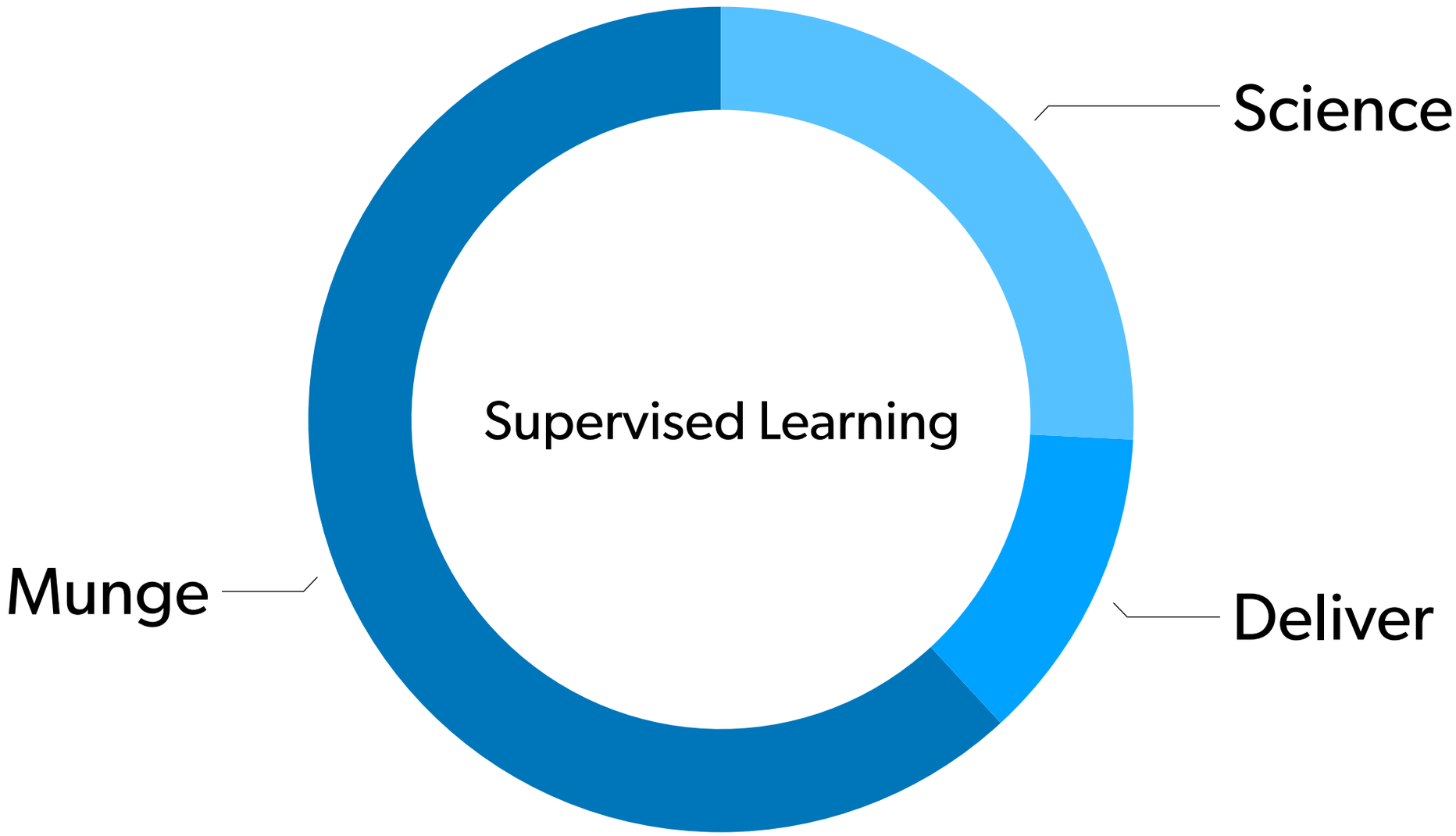
How do you spend your “Data Science” time?



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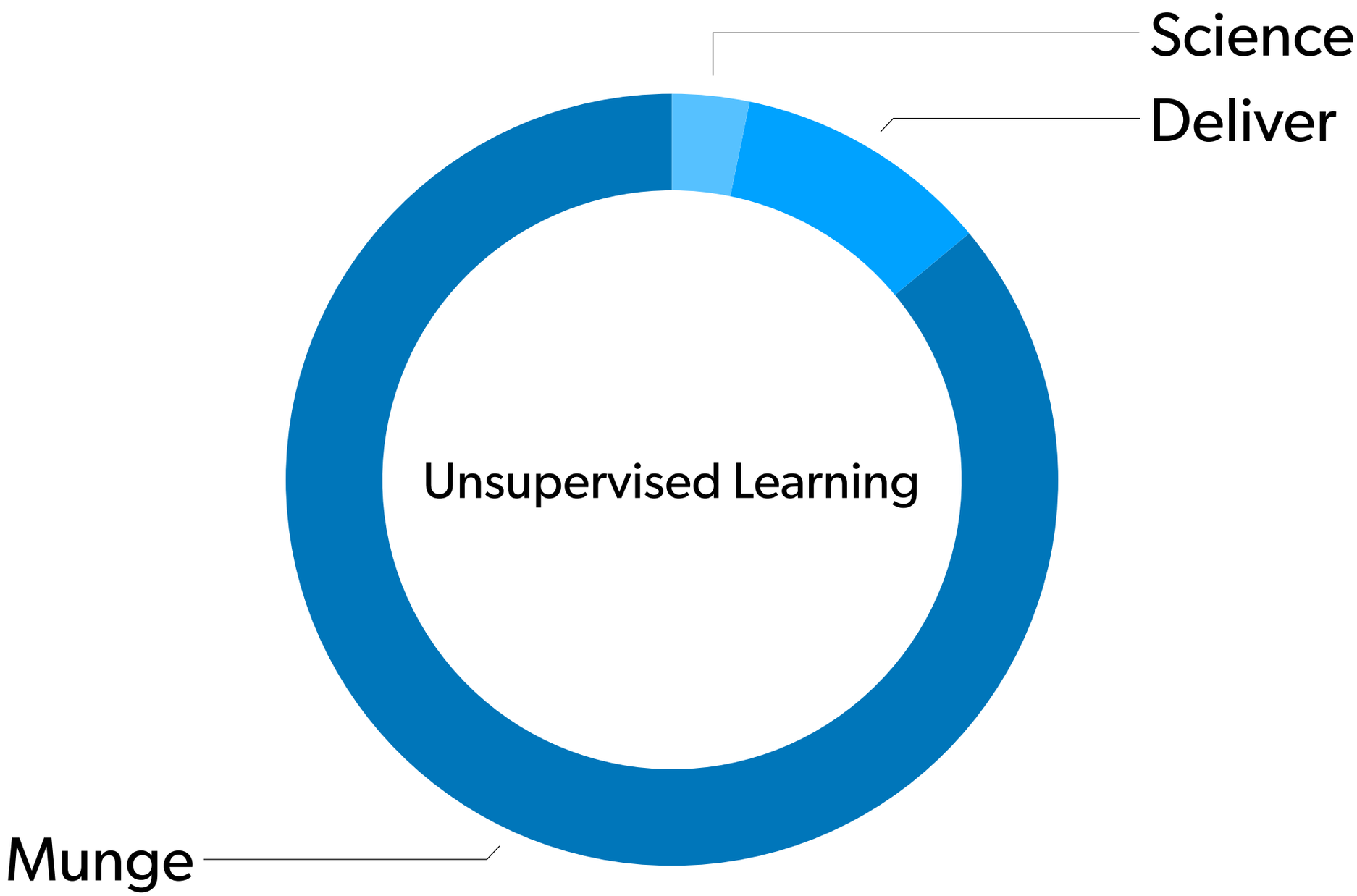
How do you spend your “Data Science” time?



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Source: Youtube: Cårven Der Pümpkîn: https://www.youtube.com/watch?v=2Qj8PhxSnhg

The Right Tools for the Job

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The Right Tools for the Job

- Revision Control: **git** and (github/gitlab/bitbucket)
- Language: **python 3.6+**
- Package Manager and Virtual Environments: **conda**
- Frameworks: **scikit-learn, joblib**
- IDE: **jupyter notebook**
- Scripting: **make**
- Templates: **cookiecutter**

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Data Science is a DAG

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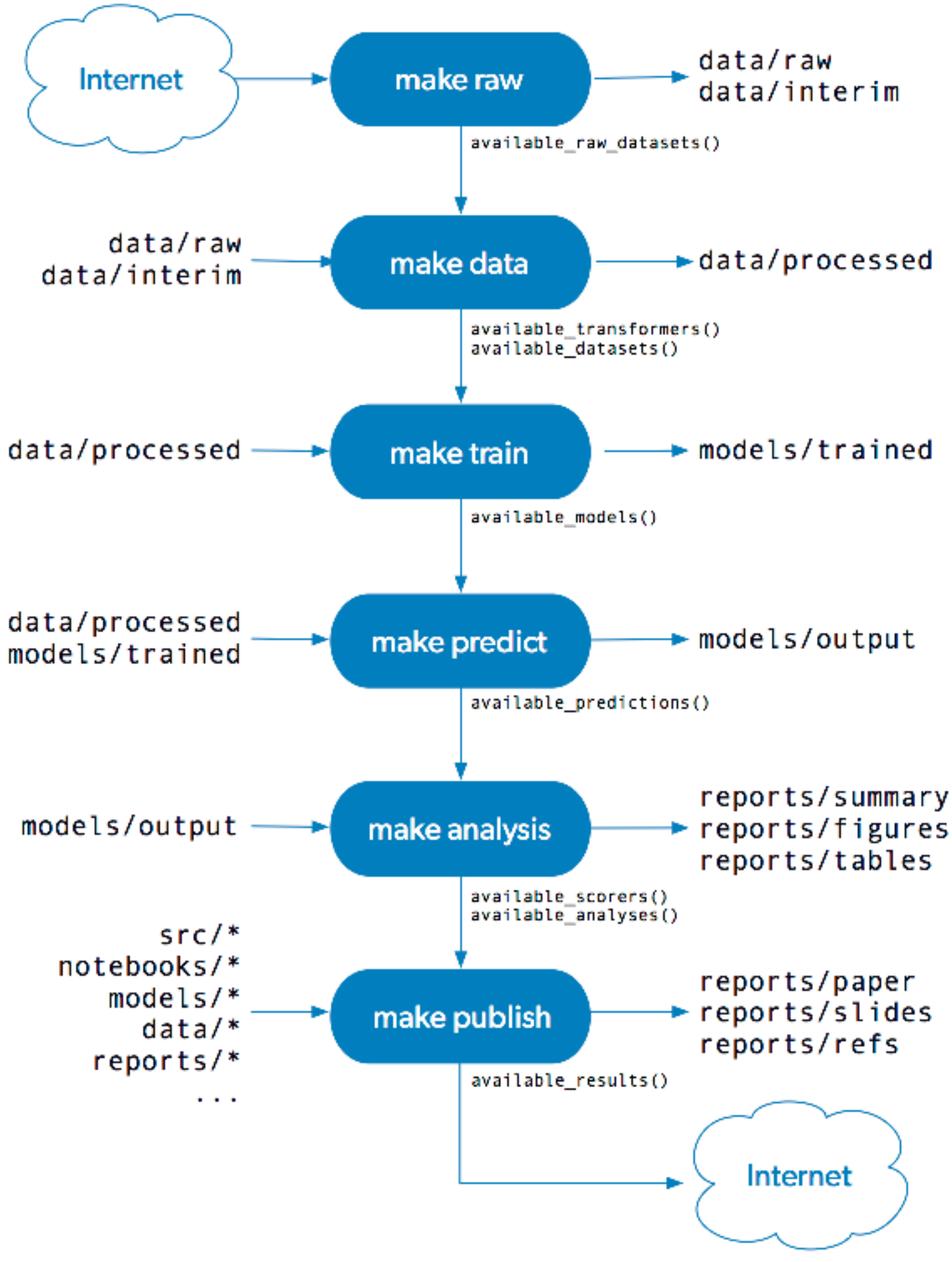

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“Raw Data is Read-Only”

Sing it with me

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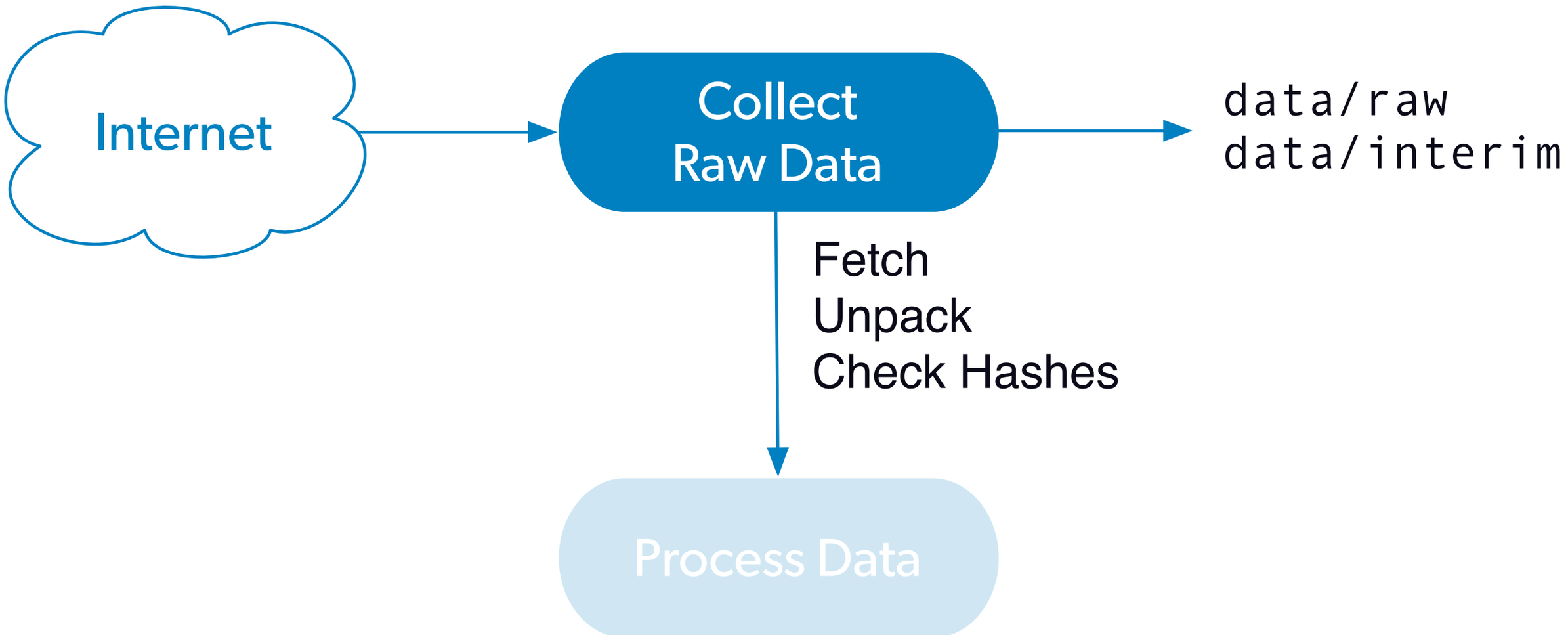

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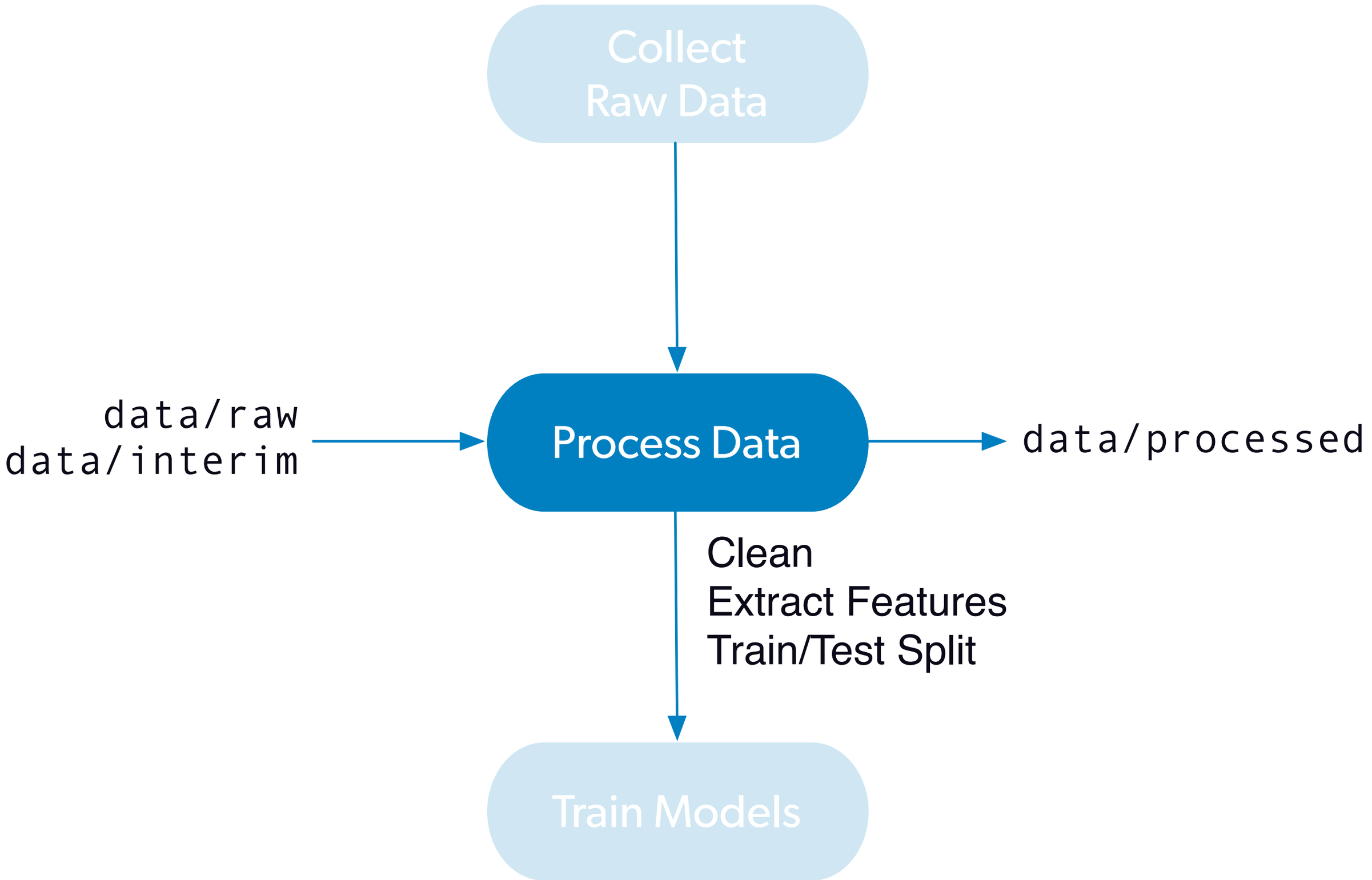

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We’re gonna (data) science the *@#! out of this

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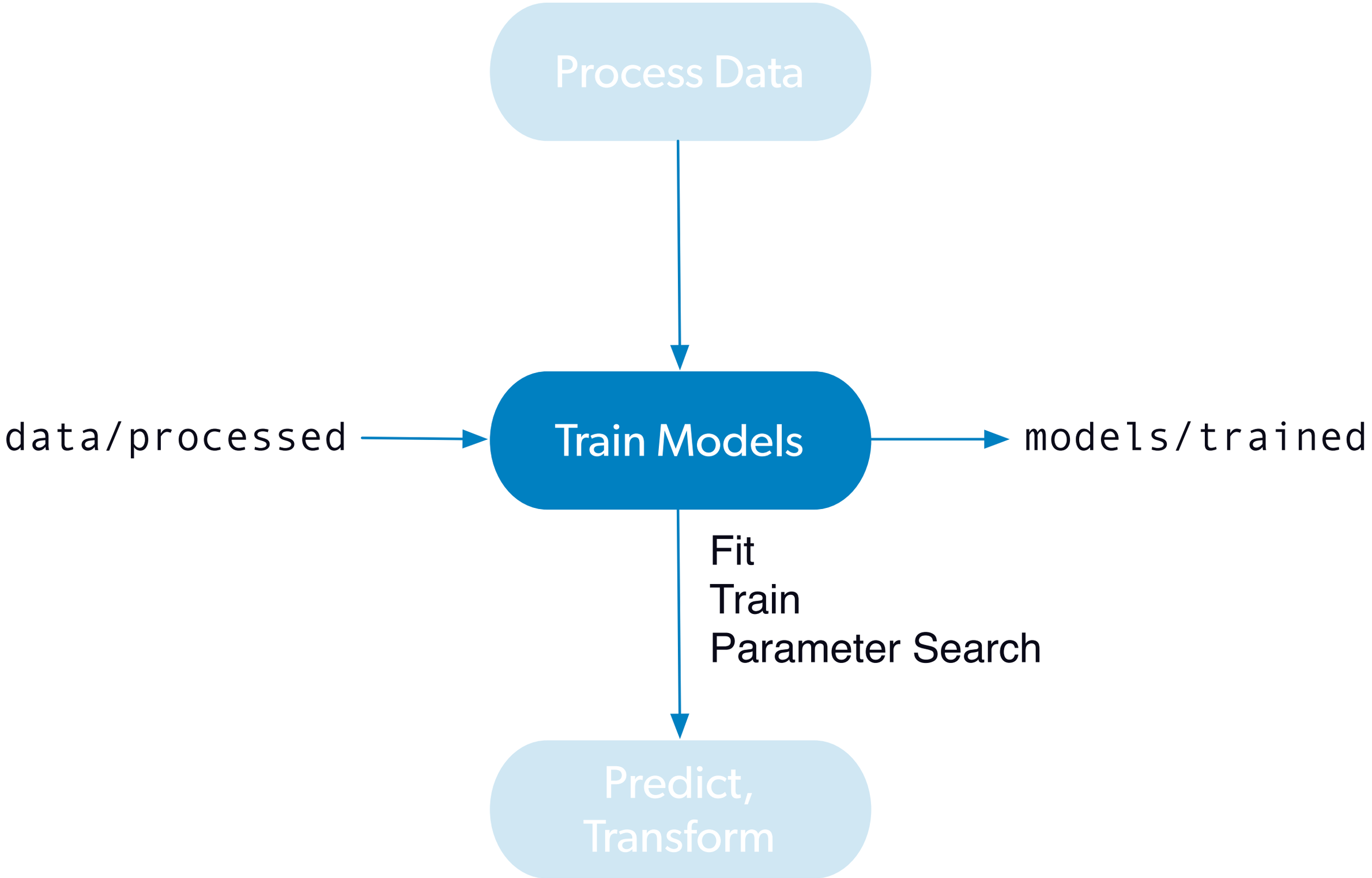

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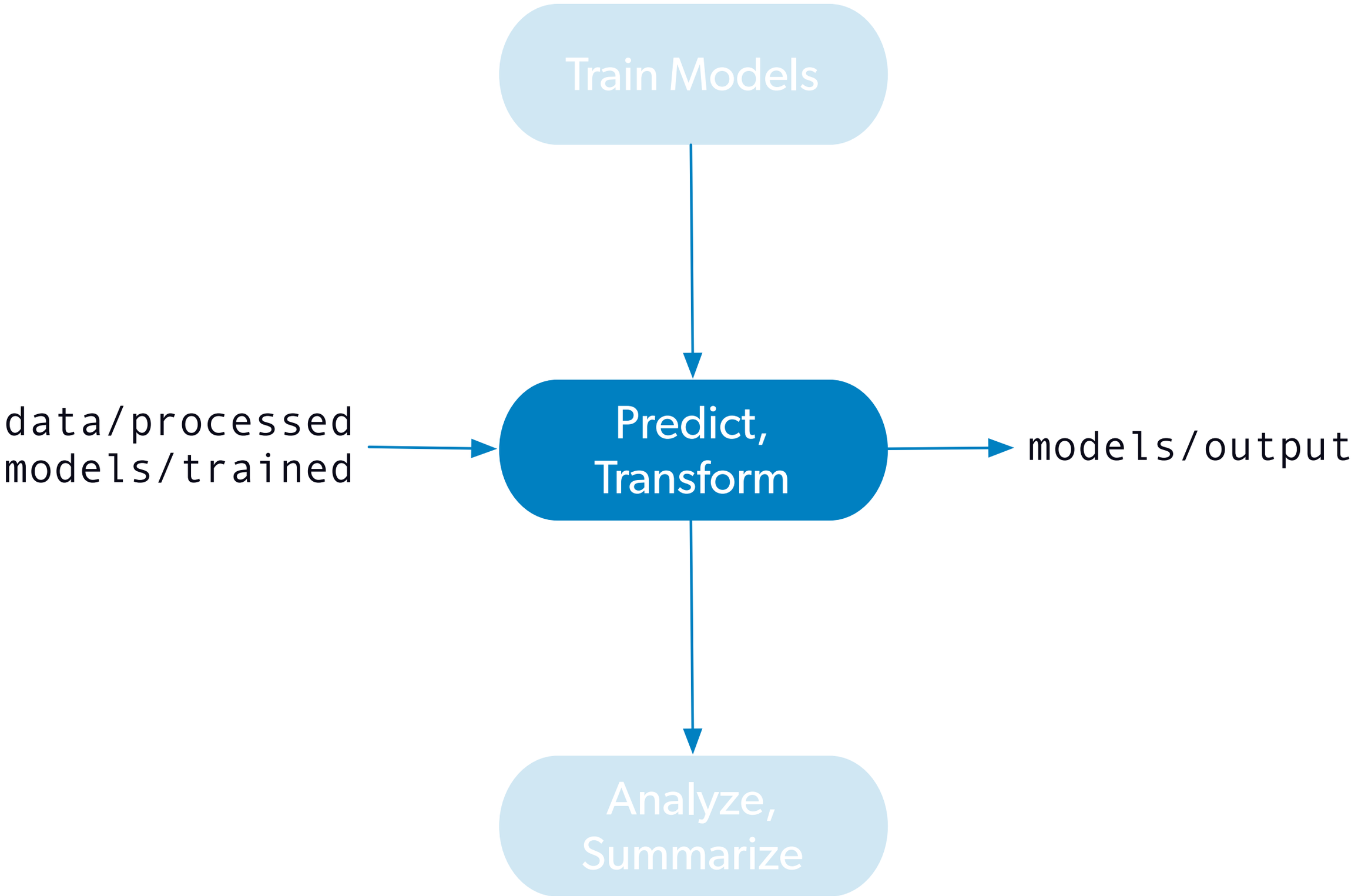

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I'm only here for the Pretty Pictures

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Predict,
Transform

models/output

Analyze,
Summarize

reports/summary
reports/figures
reports/tables

Summary Statistics
Data Tables
Figures

Publish

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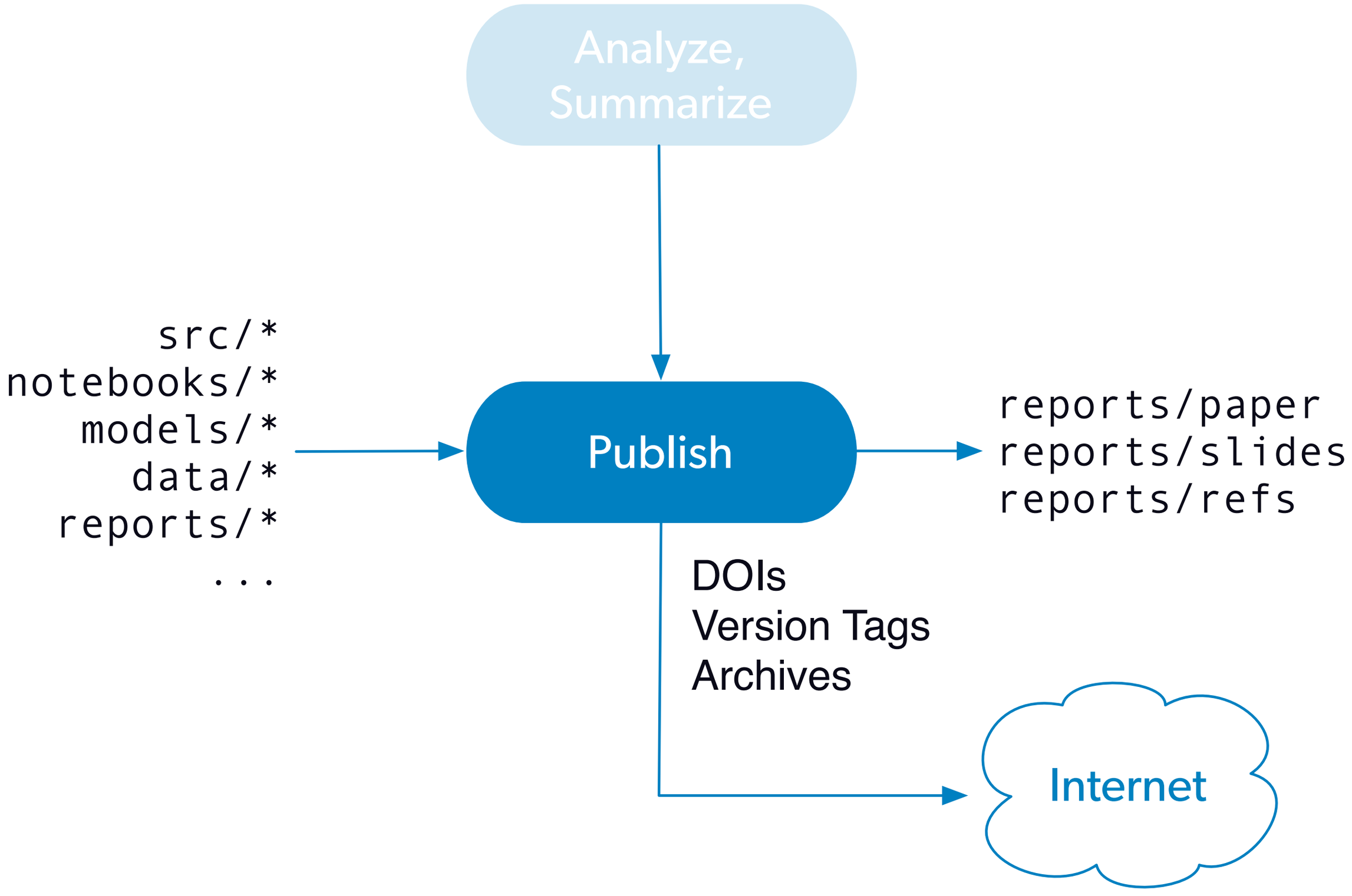

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What's your Bus Number?

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