🦜🔗

Prompt Engineering 101: Beginner intro to LangChain

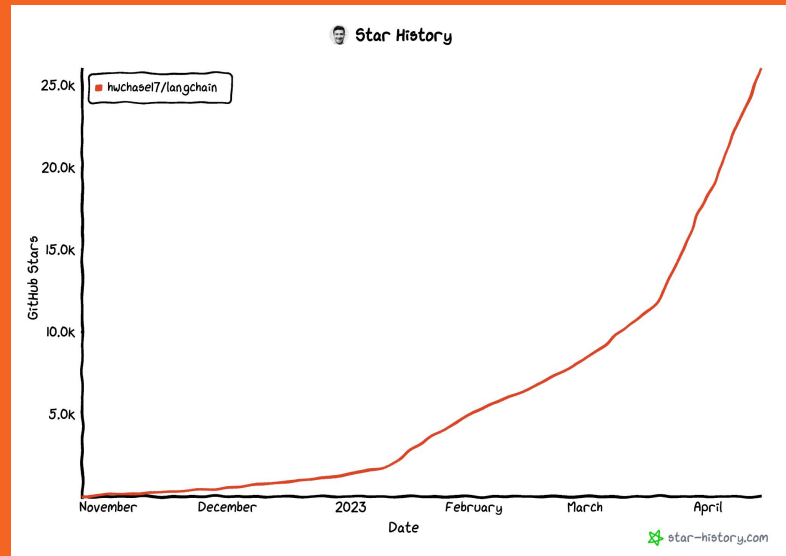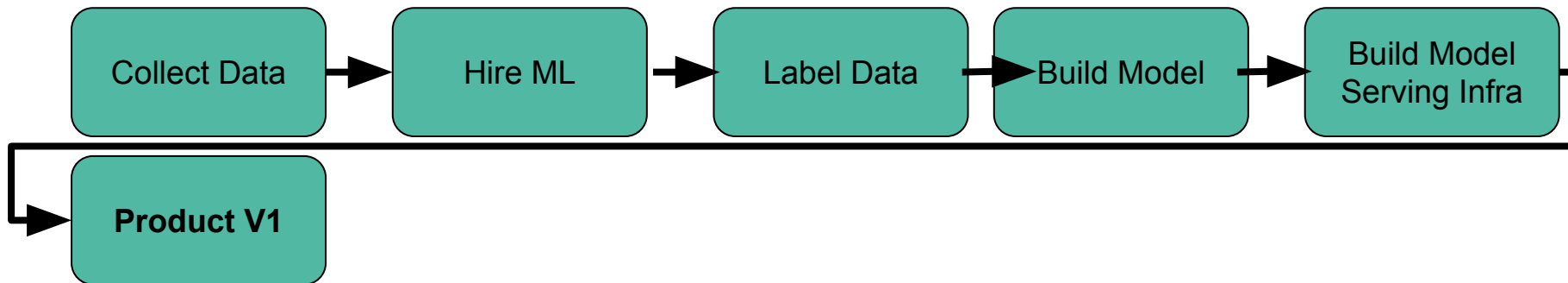# Lev Konstantinovskiy
PyData DE 2023

AGENDA

1. LLM world overview
2. Example deep-dive
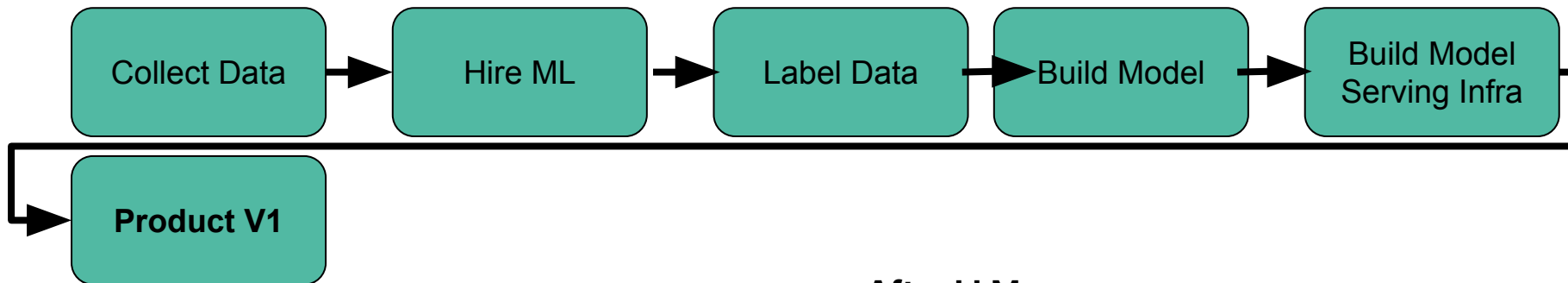3. Evaluation
4. The future

Why The Hype?

6 months old
$10mln seed April 2023

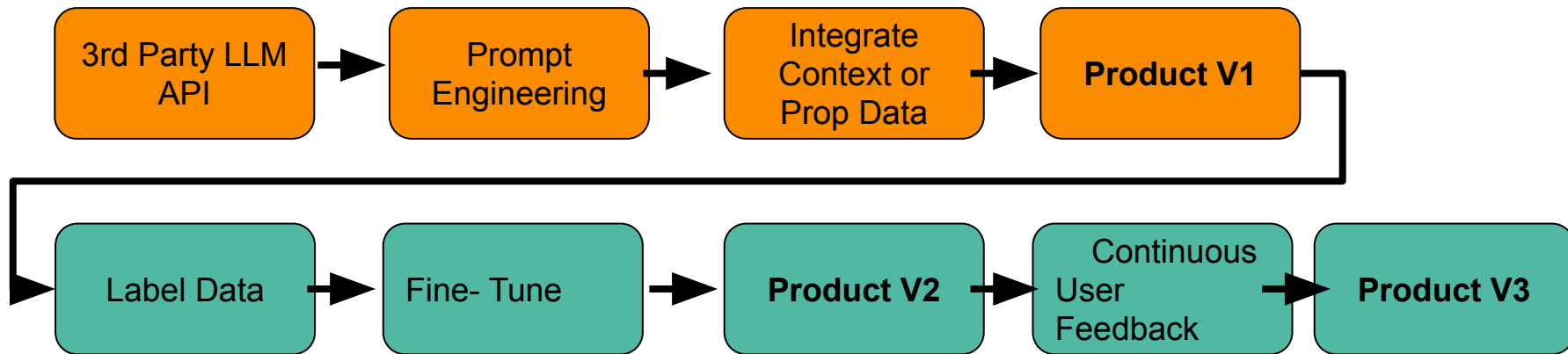# Building ML prototypes before LLMs was hard

Collect Data → Hire ML → Label Data → Build Model → Build Model Serving Infra → **Product V1**

Building ML products before LLMs

Collect Data → Hire ML → Label Data → Build Model → Build Model Serving Infra → **Product V1**

After LLMs

3rd Party LLM API → Prompt Engineering → Integrate Context or Prop Data → **Product V1** → Label Data → Fine- Tune → **Product V2** → Continuous User Feedback → **Product V3**

Based on Diego Oppenheimer "DevTools for Language Models"

Before LLMs life was hard

Collect Data → Hire ML → Label Data → Build Model → Build Model Serving Infra → **Product V1**
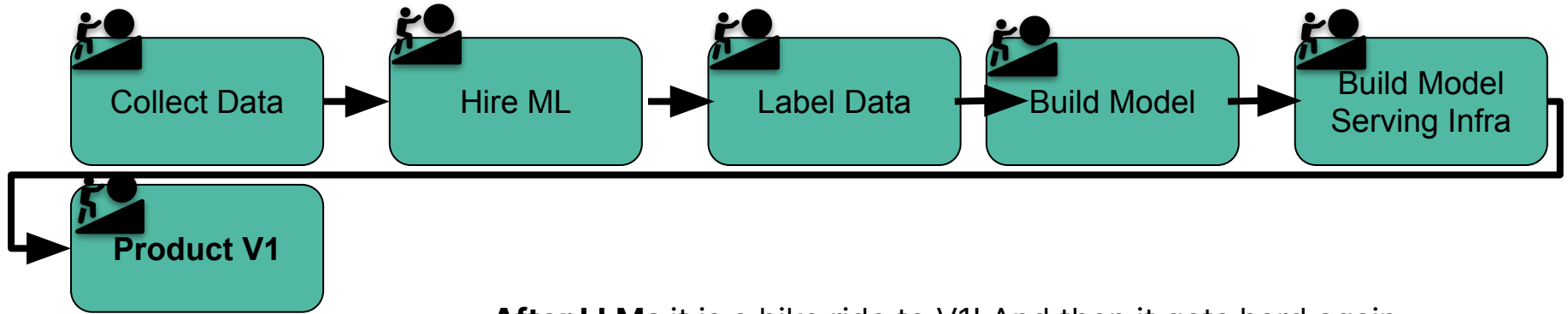
After LLMs it is a bike ride to V1! And then it gets hard again

3rd Party LLM API → Prompt Engineering → Integrate Context or Prop Data → **Product V1**

Label Data → Fine- Tune → **Product V2** → Continuous User Feedback → **Product V3**

Based on Diego Oppenheimer "DevTools for Language Models"
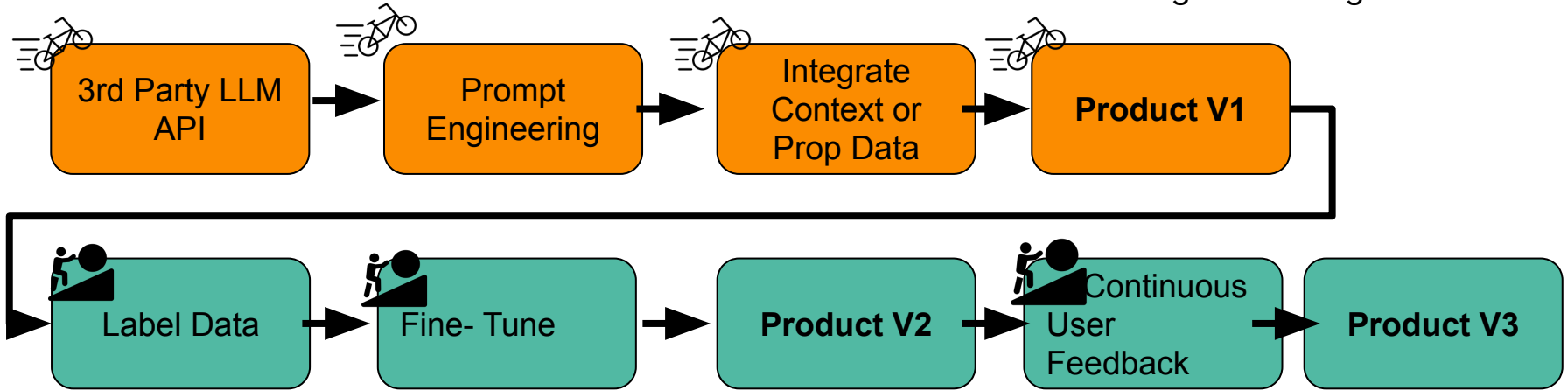
During a Gold Rush, Sell Shovels!
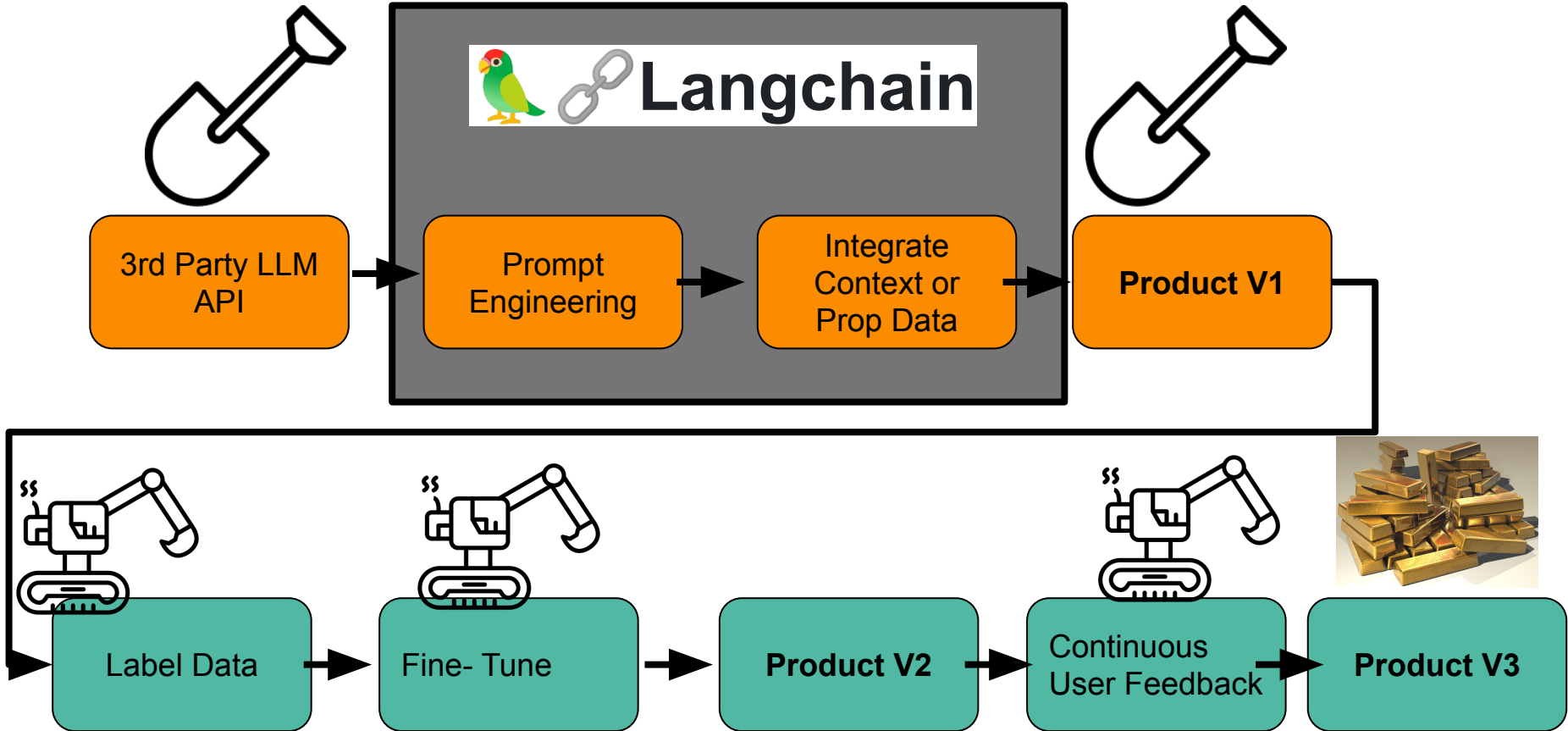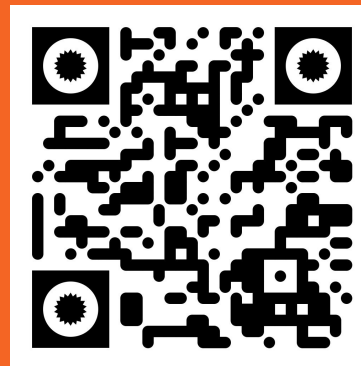
Code Example

Answer the questions:

When is the PyCon DE & PyData Berlin 2023 conference?

How many days are between that date and today?

You can use the internet and Python REPL

Notebook in repo:
https://github.com/tmylk/langchain-agent-qa/blob/main/AgentQA.ipynb

```
tools = load_tools([
    "serpapi",
    "llm-math"],
    llm=my_llm)
my_agent =
initialize_agent(
    tools,
    my_llm,

agent="zero-shot-react
-description",
    verbose=True)
```

Tool

- **Deterministic**
- Like
    - Python
    - Send an email

LLM learns new tools very easily from short description in Prompt

"Calculator: Useful for when you need to answer questions about math."

Agent

- **Non-deterministic**. Makes its' own decisions.
- Every time we call it, can get a different result.
- Google Search results change
- Underlying LLM is non-deterministic
- "Agent-as-a-service" trend.

Answer: The PyCon DE & PyData Berlin 2023 conference is on 16 January 12:00 CET and there are 45017 days between that date and today.

Blog   FAQ   Sponsors   • Program   Job Board   Financial Aid

No.

Reselling Tickets

Tickets are personalized. Re-selling tickets is prohibited. It's ok to order tickets for a friend of subsidary with reimbursement.

When are you going to start selling the tickets?

Ticket sales will open

> 16 January 12:00 CET.

1 Search agent demo
() → The PyCon DE & PyData Berlin 2023 c...
$0.03

7 AgentExecutor
When is the PyCon DE & PyData Berli... → When is the PyCon DE & PyData Berli...
$0.03

f **OpenAI**
Answer the following questions as b... Thought: → I need to find the date of the con...
$0.00

f **SerpAPIWrapper**
PyCon DE & PyData Berlin 2023 → We aim to be an accessible, communi...

f **OpenAI**
Answer the following questions as b... Thought: → I need to look for a more specific...
$0.01

f **SerpAPIWrapper**
PyCon DE & PyData Berlin 2023 date → 16 January 12:00 CET.

f **OpenAI**
Answer the following questions as b... Thought: → I need to calculate the number of...
$0.01

2 LLMMathChain
16 January 12:00 CET - today → 16 January 12:00 CET - today
$0.00

f **OpenAI**
Translate a math problem into Pytho...Question with math problem.} ```python ${... → ```python from datetime import dat...
$0.00

f **PythonREPL**
from datetime import datetime dat... → 45015

f **OpenAI**
Answer the following questions as b... Thought: → I now know the final answer. Final...
$0.01

Prompt Engineering is tricky

Small change to prompt and tools - big change in result. Only works for a flimsy V1 of the product. See notebook.

- Google + Python = wrong conference date, correct today's date
- Indexed Website + PythonMath = correct conference date(!), wrong todays date
- Indexed Website + Python for dates = wrong conference date, correct today's date
- To-Do list generator = goes on a tangent about conference food

Self-Evaluation

Inputs

input: 3

Grade the student answers based ONLY on their factual accuracy. Ignore differences in punctuation and phrasing between the student answer and true answer. It is OK if the student answer contains more information than the true answer, as long as it does not contain any conflicting statements. Begin!

QUESTION: When is the PyCon DE & PyData Berlin 2023 conference? How many days are between that date and today?
CORRECT ANSWER: On 17 April. There are -2 days
STUDENT ANSWER: The PyCon DE & PyData Berlin 2023 conference is on 16 January 12:00 CET and there are 45014 days between that date and today.
EXPLANATION:

`Copy to clipboard`

Outputs

output 3:

1. Check the date of the conference: The correct answer is 17 April, while the student answer is 16 January.
2. Check the number of days between the conference and today: The correct answer is -2 days, while the student answer is 45014 days.
GRADE: 0

`Copy to clipboard`

Future of LangChain

- TypeScript support on par with Python
    - *Frontend dev skills are enough create an ML product V1 in 2023*
    - Don't worry. Python still needed for V2 and V3
- More new papers implemented in nice Python
- Production support by LangChain Inc
- More Agents, Document readers, Retrievals, Input and Output formats
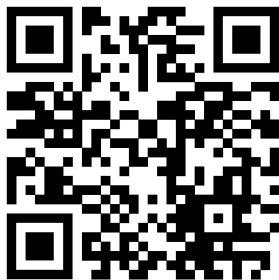
Thank you.
Join a meetup to code Langchain together.

MON, APR 24, 2023, 7:00 PM CEST

TDD with LangChain as an Ensemble

▢◁ Online event

This time we will write an agent app in the new LangChain framework that makes it easy to work with Large Language Models.
How easy is it to do Test Driven Development when calling LangChain and ChatGP...

Notebook in repo:
https://github.com/tmylk/langchain-agent-qa/blob/main/AgentQA.ipynb