Using AI Tools and Python to Automate Tasks

A two-day, beginner-friendly journey to streamline workflows, boost productivity, and integrate AI into everyday tasks.

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2. **Explore ways to leverage LLMs in combination with Python**
3. **Learn how to automate tasks such as file organization and data entry**
4. **Use Python scripts to integrate with external LLM APIs**

Why Learn to Automate?

Automation as a General Skill

- **Automate Repetitive Tasks**

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- **Analyse Massive Amounts of Data**

The Real Reason....

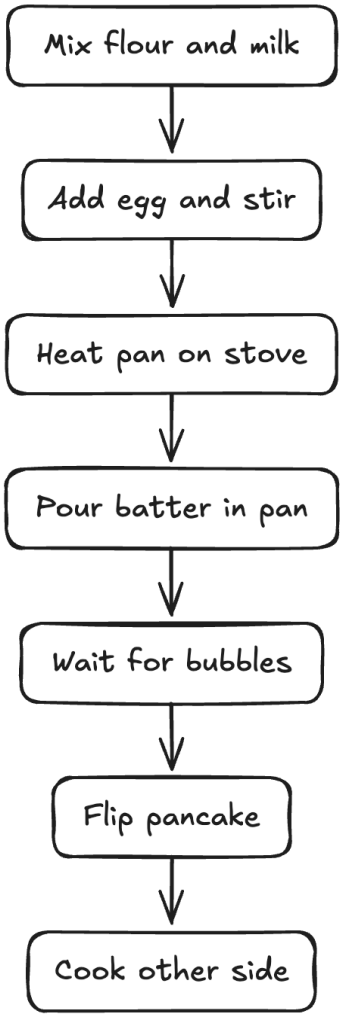
Writing code = the most general skill you can have!

It is a superpower! :)

Scripting vs. Programming

An important distinction!

Both are About Following Recipes



Scripting

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- Toy example -> Renaming multiple files

```
# Rename all .txt files in a directory to include today's date
import os
from datetime import date

today = date.today().strftime("%Y-%m-%d")

for filename in os.listdir("."):
    if filename.endswith(".txt"):
        new_name = f"{today}_{filename}"
        os.rename(filename, new_name)
```

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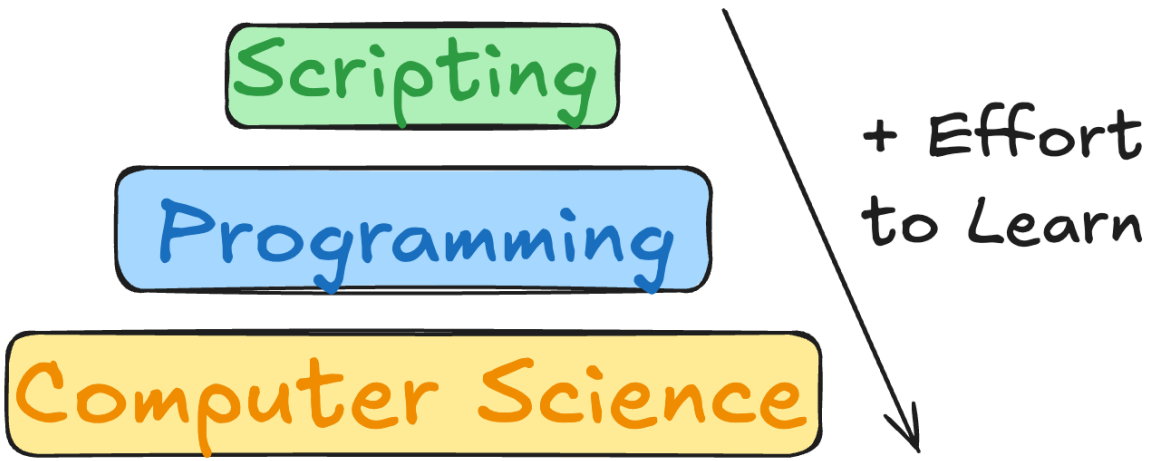
- It's about developing software systems (implementing engineering practices, etc..)
- Involves structure, design patterns, and often collaborative development
- *Programming is considerably more effortful than scripting.*



This course focuses on Scripting!

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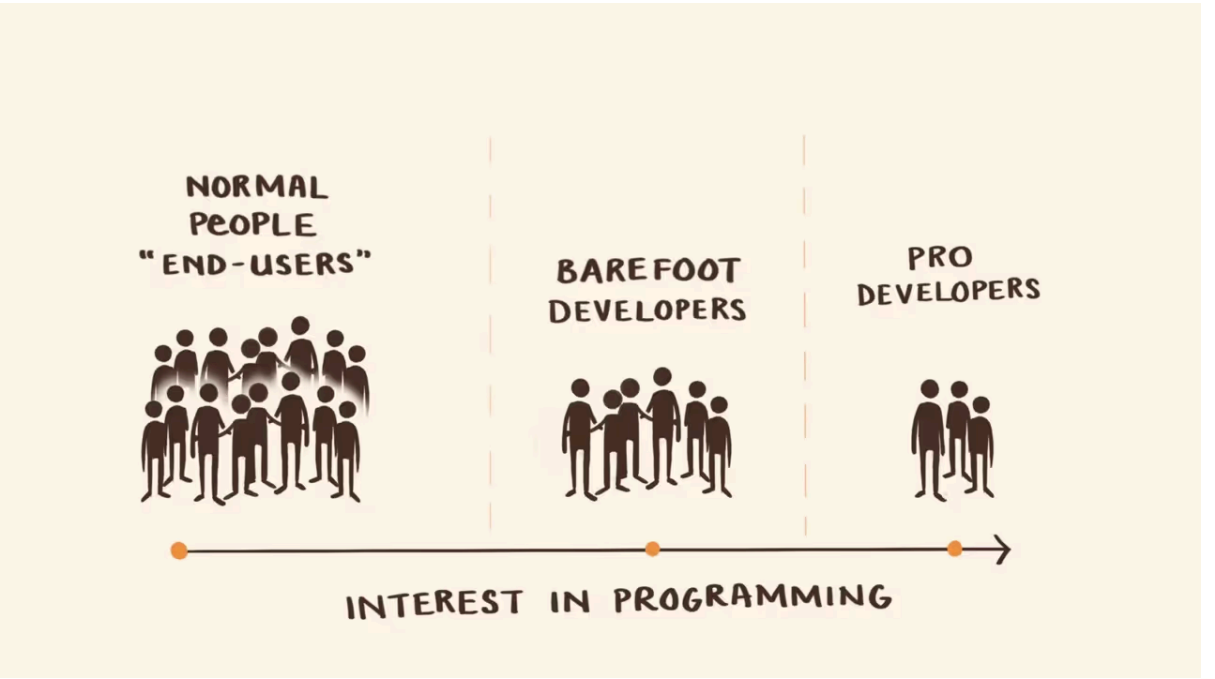

Home-Cooked Software and Barefoot Developers

The Ostrich Approach to Learning Python

Ostrich algorithm

From Wikipedia, the free encyclopedia

In computer science, the **ostrich algorithm** is a strategy of ignoring potential problems on the basis that they may be exceedingly rare. It is named after the ostrich effect which is defined as "to stick one's head in the sand and pretend there is no problem". It is used when it appears the situation may be more cost-effectively managed by allowing the problem to continue to occur rather than to attempt its prevention.

It's about Learning What We Need for Our Tasks!

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And purposefuly ignoring that which does not seem to have any effect on its success.

Why Python?

Python is Easy and Everywhere

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- Python is used across the board in AI from developing AI models to powering self-driving cars
- Python is super easy to learn due to its proximity with natural language

The Busy Person Guide to Python Basics

Python Things We Will Learn

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- That is a lot! How can we manage?
- Use AI conversationally! Asking questions and clarifying what you don't know!

How to Use AI to Learn/Use Python

A quick detour to set up an AI toolkit to speed up our Automation skills

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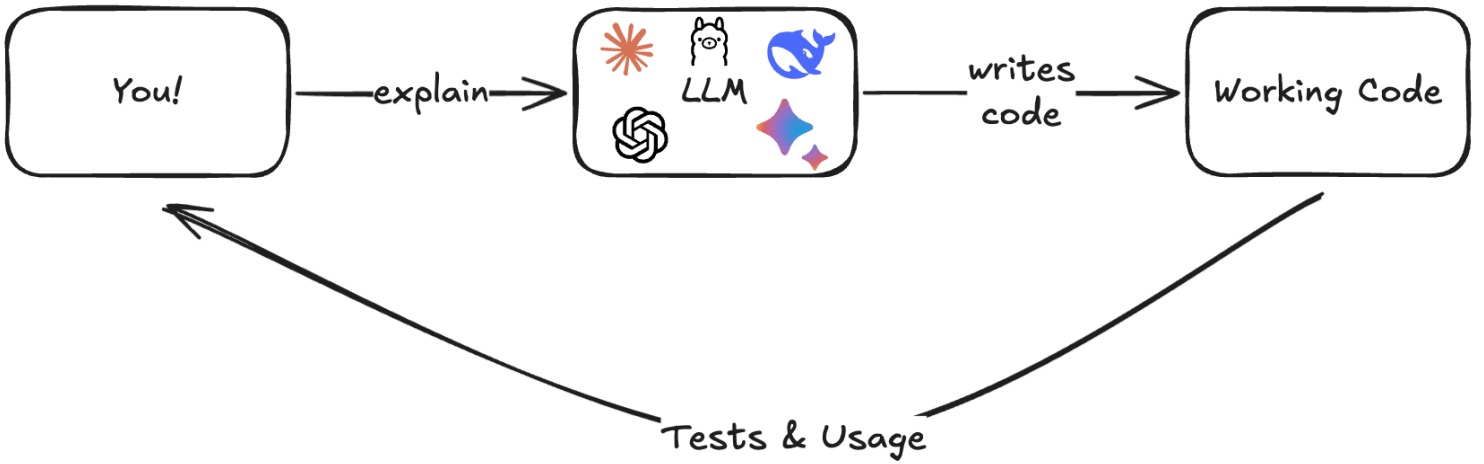

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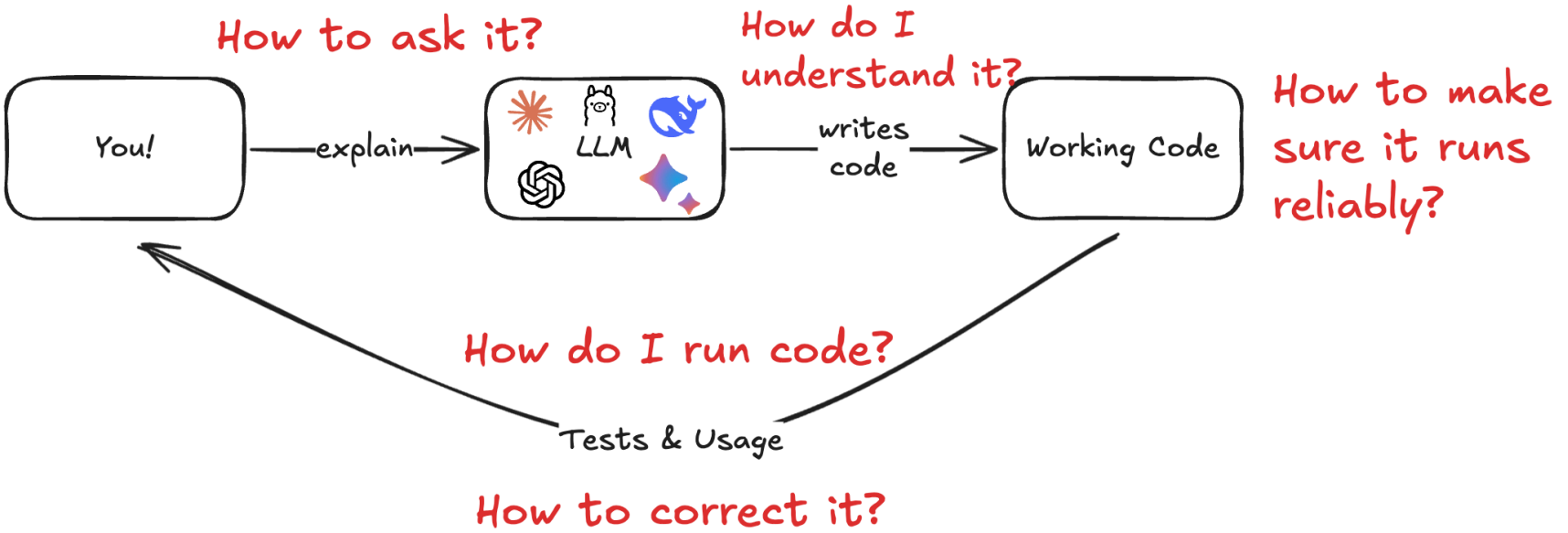

Demo - Meta-Strategy for Scripting with AI

Data Types, Operations, Variables

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- The things we can do to it are called **operations** (like 5+5)
- To organize things, we use variables to define what each thing is

Data Types, Operations, Variables - Example

- Here is a piece of code that defines a variable of some type and performs a simple operation on the data stored in the variable

```
# This is data of type string!
name = "Lucas"

# This is data of type integer!
actual_age = 33

# This is data of type integer!
mental_age = 12

# our operation
average_age_between_actual_and_mental = (actual_age + mental_age) / 2

# special function that displays what goes inside of it
print(average_age_between_actual_and_mental)

# this would be a float!
# Output: 22.5
```

Data Types; Operations; Variables - Demo

Data Types, Operations, Variables

- **Core Data Types**:
  - **int**: whole nubmers like 1, 2, 3 ...
  - **float**: decimal numbers like 1.1, 1.0, etc...
  - **string**: text like `'Hello'`
  - **bool**: logical booleans like True or False

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- **Operations**:
  - **Arithmetic** (`+`,`-`,`/`,`*`,`//`,`%`)
  - **String concatenation** (`'Lucas' + ' is' + ' wonderful' = 'Lucas is wonderful'`)
  - **Logical operations** (`and`, `or`, `not`)
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- **Variables**: Storing data for reuse, assigning and reassigning values:

```
a = 10
b = 20
```

Functions

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- We could do this by simply writing a script:

```
# Arithmetic operation: multiplication of parameters
tax = price * tax_rate
# Arithmetic operation: addition of variables
total = price + tax
```

- But what if I want to re-use this code for different prices and tax rates?

Functions

- Here is what it would look like if we define a function to do this:

```
def calculate_total(price, tax_rate):
    tax = price * tax_rate
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def calculate_total(price, tax_rate):
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- Now we can re-use the function for different prices and tax rates:

```
shirt_price = 10
shirt_tax_rate = 0.05
pants_price = 20
pants_tax_rate = 0.1

print(calculate_total(shirt_price, shirt_tax_rate))
# Output: 10.5
print(calculate_total(pants_price, pants_tax_rate))
# Output: 22.0
```

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- **Defining a Function**: `def function_name(parameters):`
- **Return Values**: Make your functions flexible and reusable
- **Best Practices**: Keep them short, descriptive, and single-purpose

Demo Functions

Lists & Loops

- **Lists**: Python's go-to data structure for ordered collections

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```
# Define a list of tasks
tasks = ["Buy groceries", "Finish project", "Call the bank"]
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- **Access Elements**: Indexing and slicing

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```
print(tasks[0:2])
# Output: ['Buy groceries', 'Finish project']
```

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Common Uses: Batch renaming files in a directory, processing data from tables, etc...

Demo - Lists & Loops

Dictionaries & Tabular Data

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# Dictionary of product prices
prices = {
    "apple": 0.50,
    "banana": 0.75,
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- **Common Uses**: Storing configurations, mapping relationships, caching data

Reading/Writing

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- **Common Formats**: `.csv`, `.json`, `.xlsx`, `.xls`
- CSV Files store data in rows and columns via comma-separated values:

```
Name,Age,City
John Smith,32,New York
Jane Doe,28,San Francisco
```

Name	Age	City
John Smith	32	New York
Jane Doe	28	San Francisco

Demo - Dictionaries & Tabular Data

Comparators & Conditionals

- **Boolean Comparisons**: ==, !=, >, <, >=, <=

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# Example of a boolean comparison
a = 10
b = 20
print(a == b)  # Output: False
print(a != b)  # Output: True
print(a > b)   # Output: False
print(a < b)   # Output: True
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print(a <= b) # Output: True
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```
# Example of a logical operator
print(True and False)  # Output: False
print(True or False)   # Output: True
print(not True)         # Output: False
```

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# Example of an if/elif/else statement
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elif a == b:
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else:
    print("a is less than b")
```

Demo - Working with Data

APIs, Packages, and AI as an API

- **APIs 101**: Application Programming Interface—send a request, get a response
- **Python Packages**: Example: `requests` library to make HTTP calls
- **AI as an API**: Connect to services like OpenAI or Claude for text generation, content analysis, and more

The Ostrich Approach to AI Assistants

Automating Data Extraction

- **Target Websites or Documents**: Identify patterns or structures (tables, IDs, HTML tags)
- **Techniques**: Using Beautiful Soup, Pandas, or request-response cycles
- **Practical Examples**: Extracting data from a CSV, scraping a simple webpage for product listings

Automating Basic Data Analysis

- **Data Loading**: Reading CSV files, Excel sheets, or database tables with Pandas
- **Basic Analysis**: Calculating averages, sums, or finding patterns in data
- **Visualization**: Creating simple charts or graphs to represent findings

Automating Slides

- Effective data wrangling for high quality slides
- A Hybrid Approach: AI + Python Scripts
- Bulk Processing to save time

Automating the Browser

- **Tools**: `selenium`, `playwright`
- **Common Tasks**: Logging in to websites, navigating pages, clicking buttons, scraping dynamic elements
- **Why Automate Browser Tasks?**: Speed up online research, data entry, or repetitive website interactions

Automating Filling Out Forms

- **Form Fields**: Identifying input boxes, radio buttons, checkboxes in HTML
- **Scripts**: Using `selenium` to locate elements by ID/class/xpath and input data
- **Real-World Use**: Automating repetitive website sign-up processes, survey completion, or internal data-entry forms

AI Hacks

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3. **Hybrid Approach**: Combine AI text generation with Python logic to automate tasks like content creation or bulk editing

A System for Writing Your Scripts

- **Plan**: Define the scope and goal of your automation
- **Prototype**: Write a small test script or snippet to handle one core task
- **Expand**: Add new features or handle edge cases incrementally
- **Refine**: Use AI assistance to improve structure, fix bugs, and add clarity

Using AI != Slop

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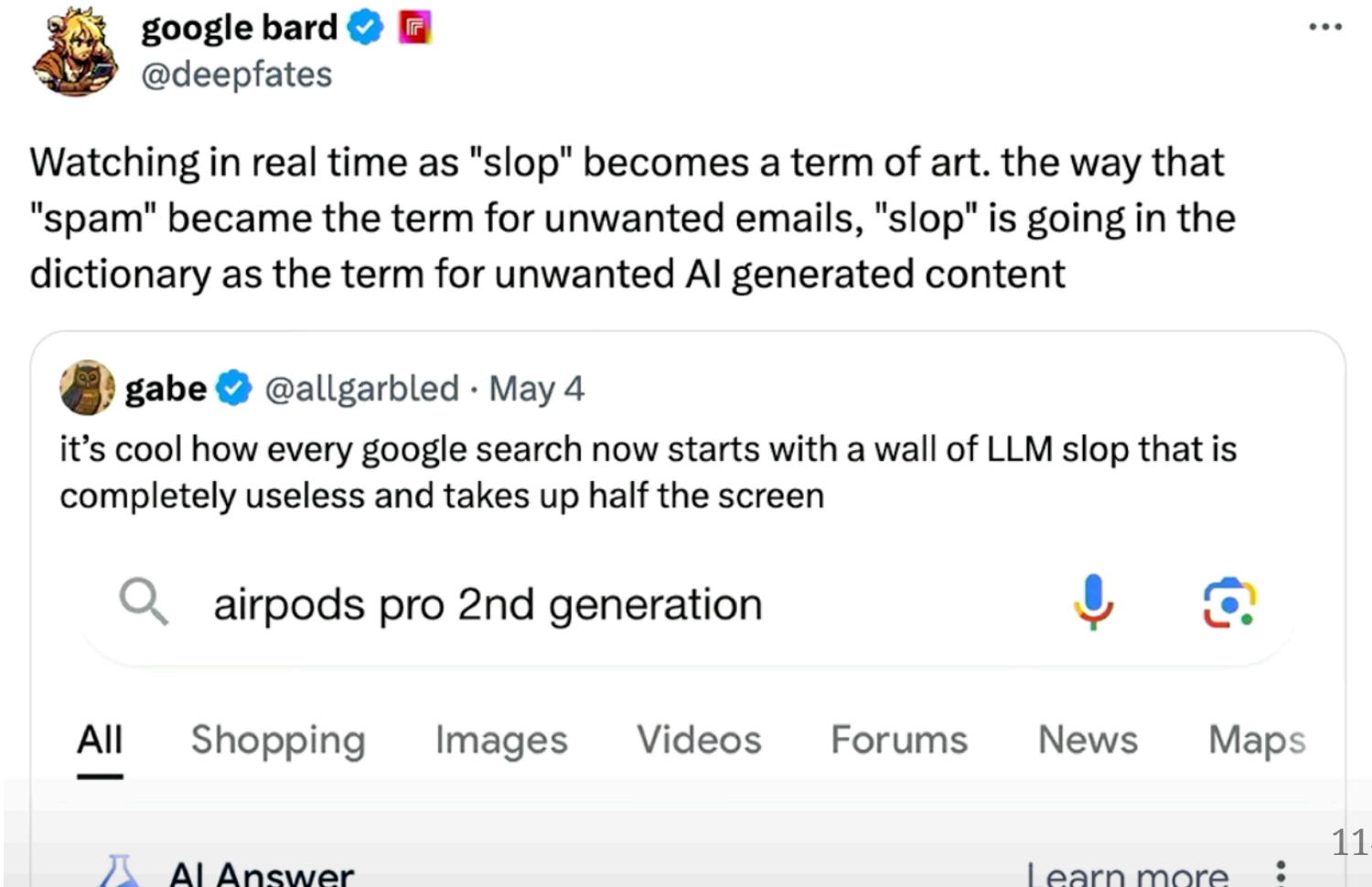
Slop is using unreviewed code from AI models



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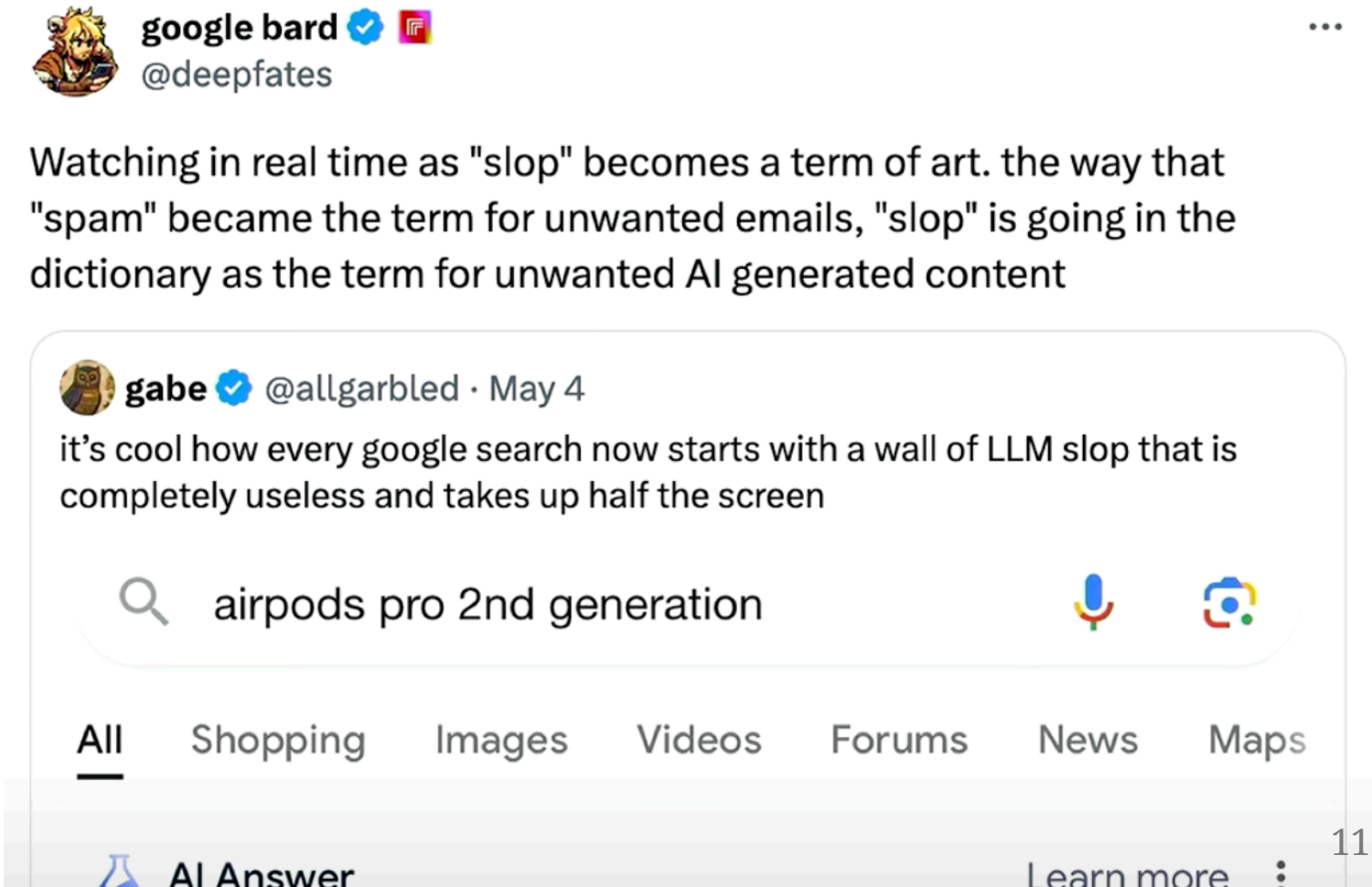

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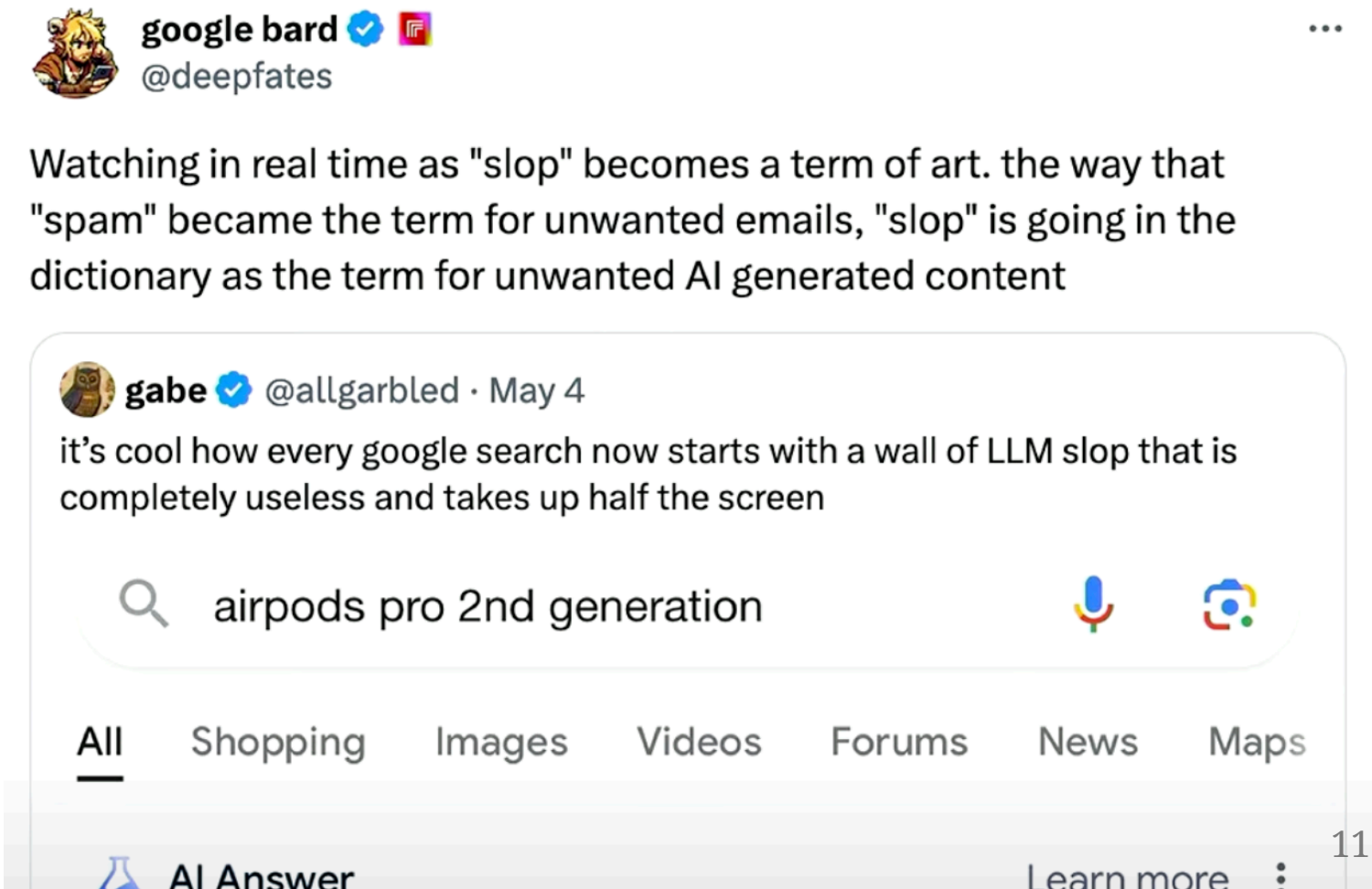

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