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**

Survey Question: Do you have a subscription for ChatGPT/Claude/Gemini?

Programming?

Making Machines Do What You Want 🤖

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- The Code:

```
def deliver_package():
  robot.move_forward(steps=10)
  robot.pick_up("box")
  robot.turn_right(90)
  robot.place_item("box")
  robot.say("Package delivered!")
```

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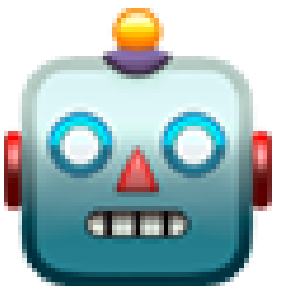
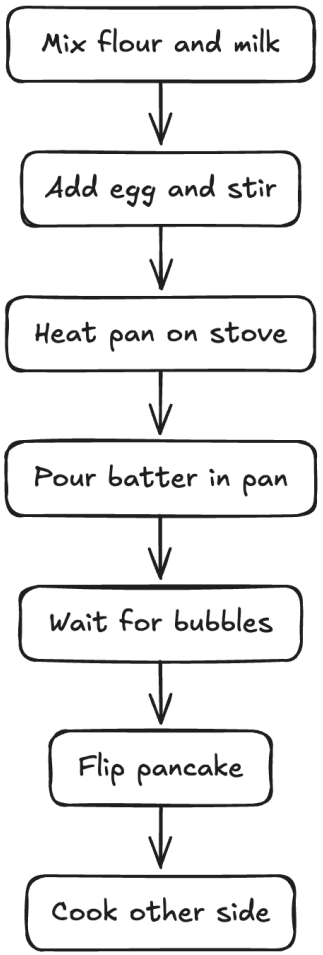


The robot follows your instructions exactly!

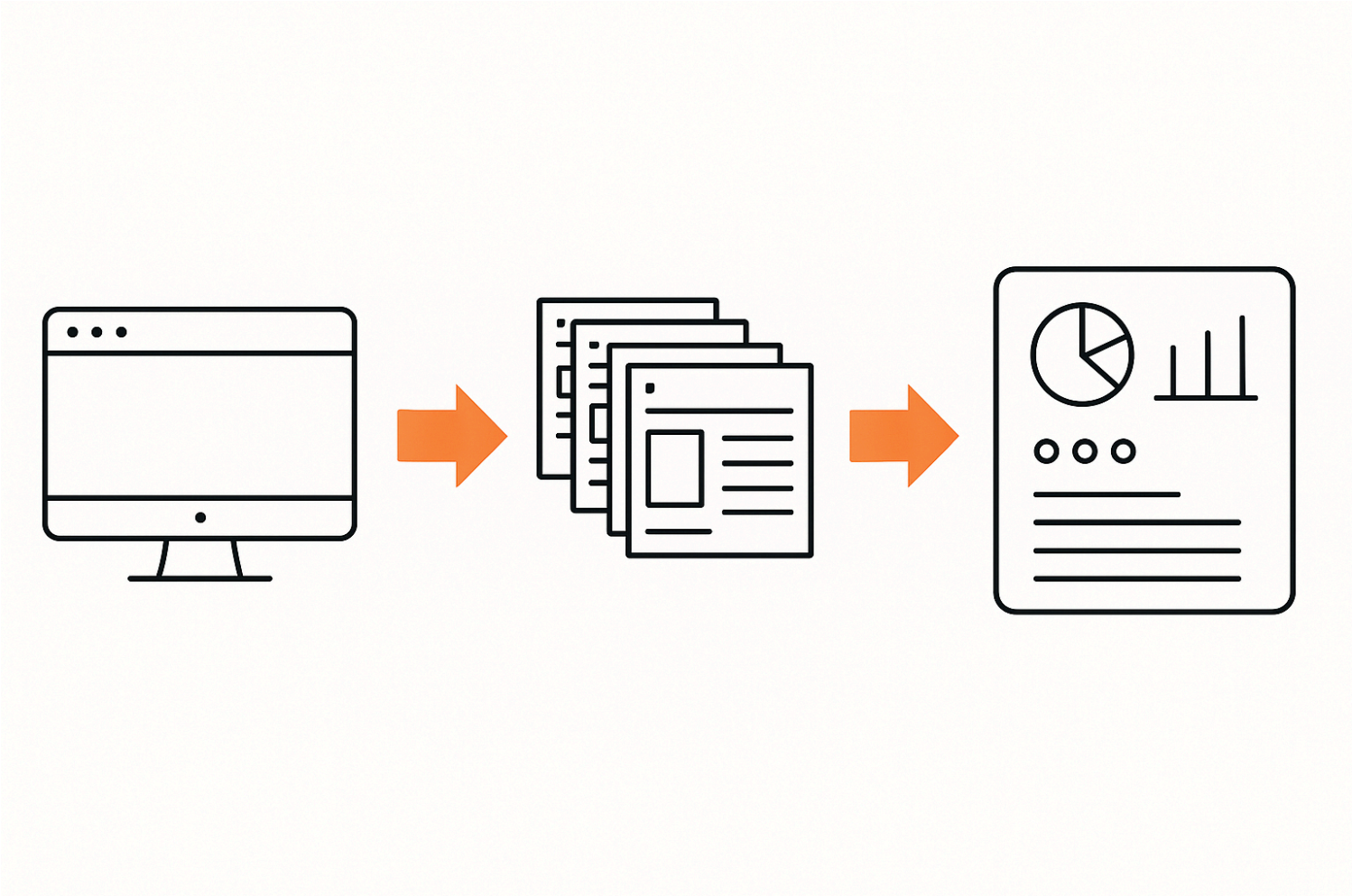
It's Like Writing Recipes




```
# Pancake Making Algorithm

    def make_pancake():
        # Step 1: Prepare batter base
        batter = mix_flour_and_milk()

        # Step 2: Complete the batter
        batter = add_egg_and_stir(batter)

        # Step 3: Prepare cooking surface
        pan = heat_pan_on_stove()

        # Step 4: Start cooking
        pour_batter_in_pan(pan, batter)

        # Step 5: Wait for indicator
        wait_for_bubbles()

        # Step 6: Turn the pancake
        flip_pancake()

        # Step 7: Finish cooking
        cook_other_side()

        return pancake
```

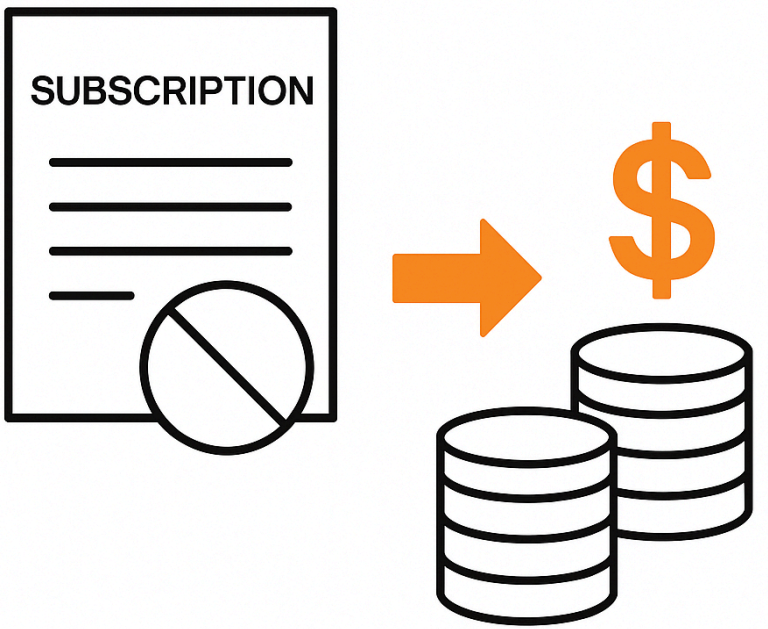
Why Learn to Automate?

Automate Repetitive Tasks



Increase Productivity

Replacing Subscriptions (saving $)



Analyse Massive Amounts of Data

Date	Sales
06/05	$12400
04/15	$16100
04/12	$5040
05/25	$23200
...	...
05/10	$1200

The Real Reason....

Writing code = the most general skill you can have!

It is a superpower! :)

Important Clarification

Learning to automate ≠ Everyone should be a developer

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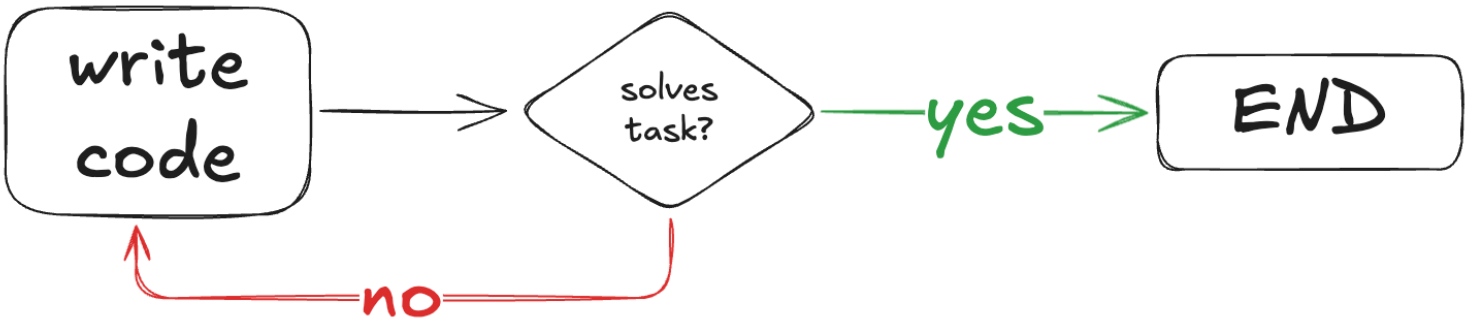
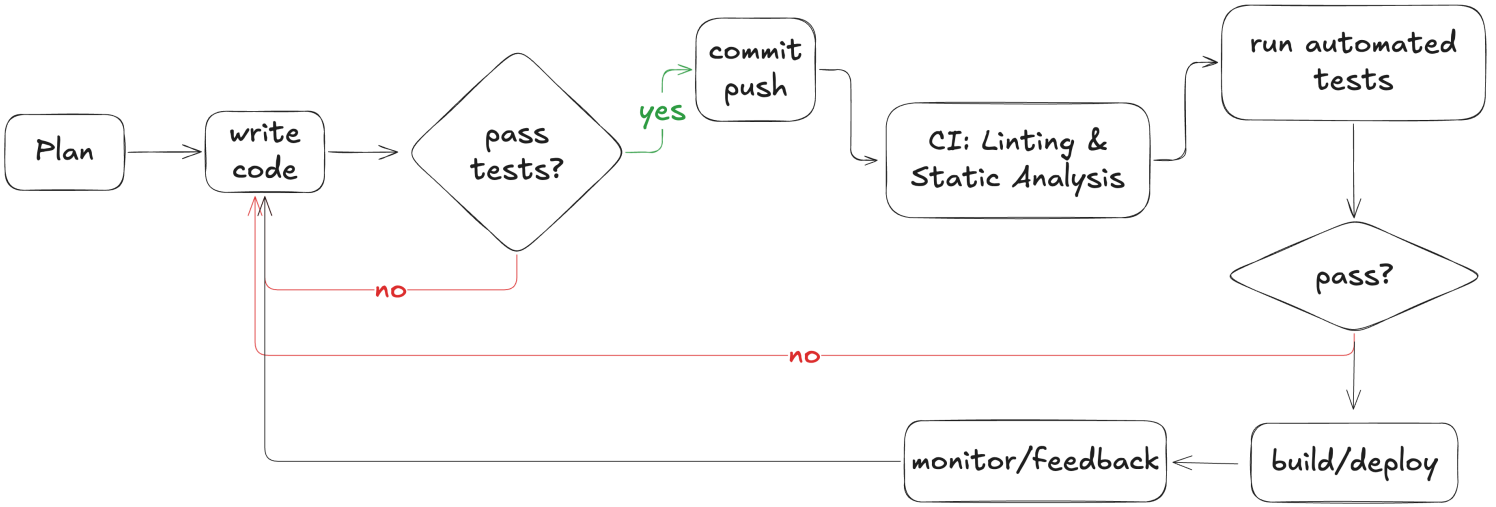
- Professional software = **complex program engineered** to be used by many people

Scripting ≠ 'Software Engineering'

Scripting



Software Engineering



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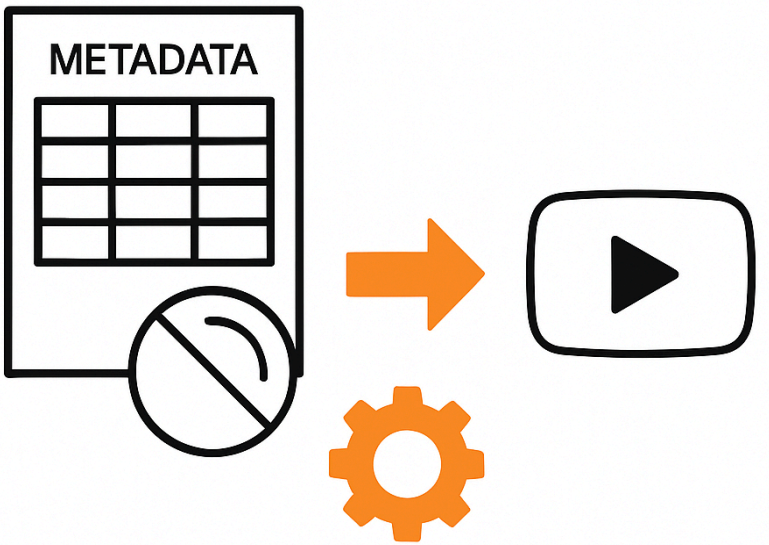
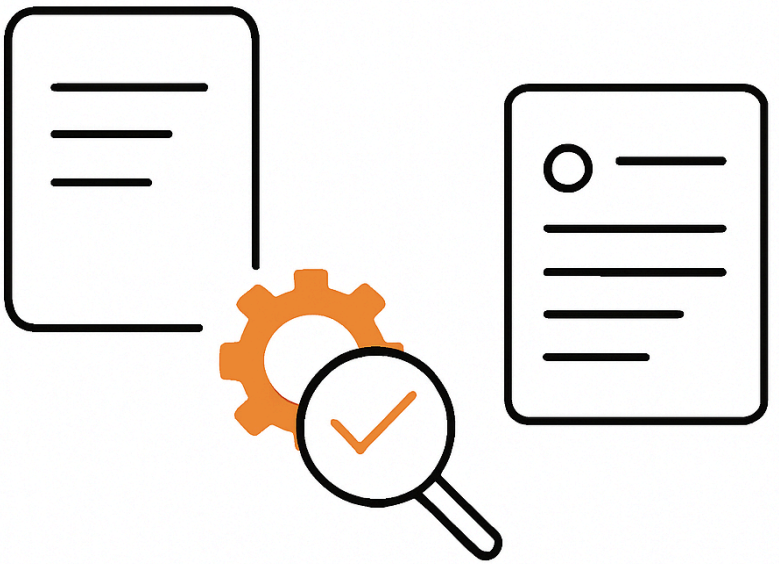
- You don't think that much about it
- Typically used for automations, data manipulation, or utility tasks

Real Automation Examples (that I use!)

Bulk YouTube Upload Automation



Notes Processor



Your automation doesn't need to be perfect
—it just needs to solve YOUR problem!

Why Python?

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See how similar they are? That's Python's superpower!

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- **Beginner-Friendly**: Reads like English, minimal syntax complexity

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- **It's about learning to solve YOUR specific problems**
- Scripts should be **tailored to your unique needs**, not one-size-fits-all solutions

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.

The Busy Person Guide to Python Basics

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- Use AI conversationally! Asking questions and clarifying what you don't know!

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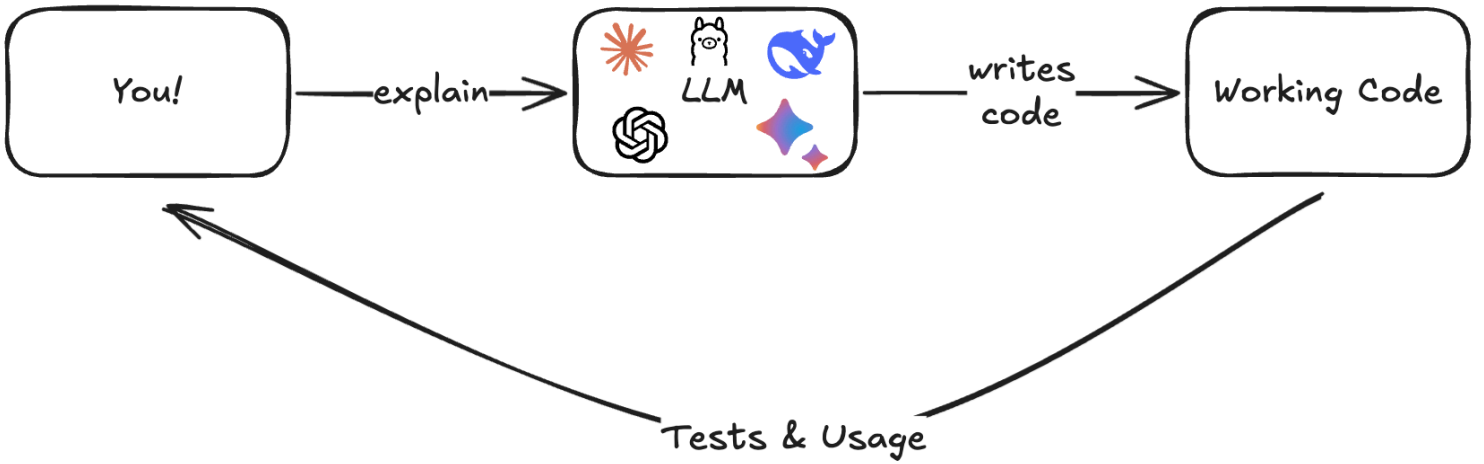

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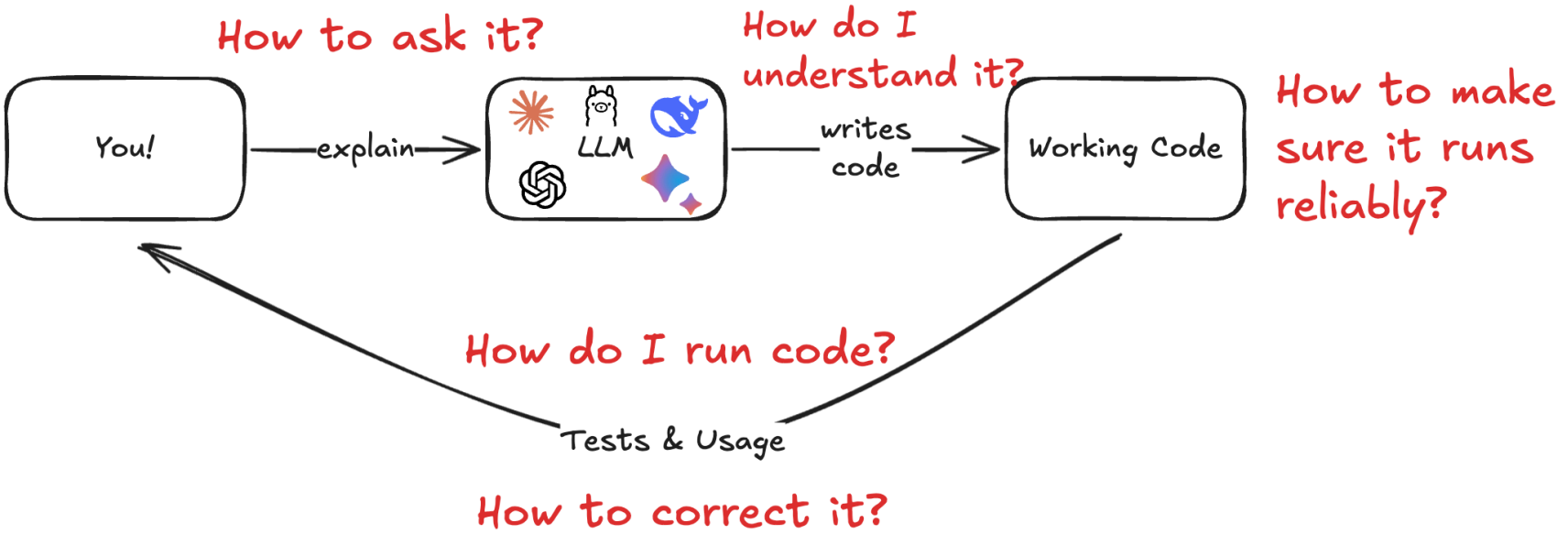

Demo - Setting Up Your Environment

(Installing Python, uv, Editor, Jupyter Notebook, AI chatbot)

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- 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

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  - **Logical operations** (`and`, `or`, `not`)
  - **Comparison operations** (`>`, `<`, `>=`, `<=`, `==`, `!=`)

- **Variables**: Storing data for reuse, assigning and reassigning values:

```
a = 10
b = 20
print(a + b)
# Output: 30
```

Demo: Functions, Lists & Loops

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):
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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

Lists & Loops

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tasks = ["Buy groceries", "Finish project", "Call the bank"]
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print(tasks[0:2])
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Common Uses: Batch renaming files in a directory, processing data from tables, etc...

Demo - Dictionaries, Tabular Data, Conditionals

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# Output: 0.50

print(prices["banana"])
# Output: 0.75
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- **Accessing Values**: Use keys to lookup values quickly

```
print(prices["apple"])
# Output: 0.50

print(prices["banana"])
# Output: 0.75
```

- **Common Uses**: Storing configurations, mapping relationships, caching data

Comparators & Conditionals

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

Comparators & Conditionals

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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
print(a >= b) # Output: False
print(a <= b) # Output: True
```

Comparators & Conditionals

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- **Logical Operators**: `and`, `or`, `not`

```
# Example of a logical operator
print(True and False)  # Output: False
print(True or False)   # Output: True
print(not True)         # Output: False
```

Comparators & Conditionals

- **Conditionals**: Using conditionals `if/elif/else` to perform different actions based on data

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```
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if a > b:
    print("a is greater than b")
elif a == b:
    print("a is equal to b")
else:
    print("a is less than b")
```

Quick Knowledge Check! 🧠

Quiz Question 1

What will this code output?

```
age = 25
if age >= 18:
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Answer: `Adult`

Explanation: Since 25 is greater than or equal to 18, the condition is True, so "Adult" is printed.

Quiz Question 2

What's wrong with this code?

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tasks = ["Email", "Meeting", "Code"]
print(tasks[3])
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Answer: Index out of range error!

Explanation: Lists are zero-indexed. This list has indices 0, 1, 2. There is no index 3!

- `tasks[0]` → "Email"
- `tasks[1]` → "Meeting"
- `tasks[2]` → "Code"

Quiz Question 3

Fill in the blank to print each fruit:

```
fruits = ["apple", "banana", "cherry"]
___ fruit ___ fruits:
    print(fruit)
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```

Answer:

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for fruit in fruits:
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Explanation: The `for` loop iterates through each item in the list, and `in` checks membership.

Demo - Working with Data, APIs & Packages

Reading/Writing

- **Tabular Data**: Data that is organized in a table format

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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

Understanding APIs & Packages

What is an API?

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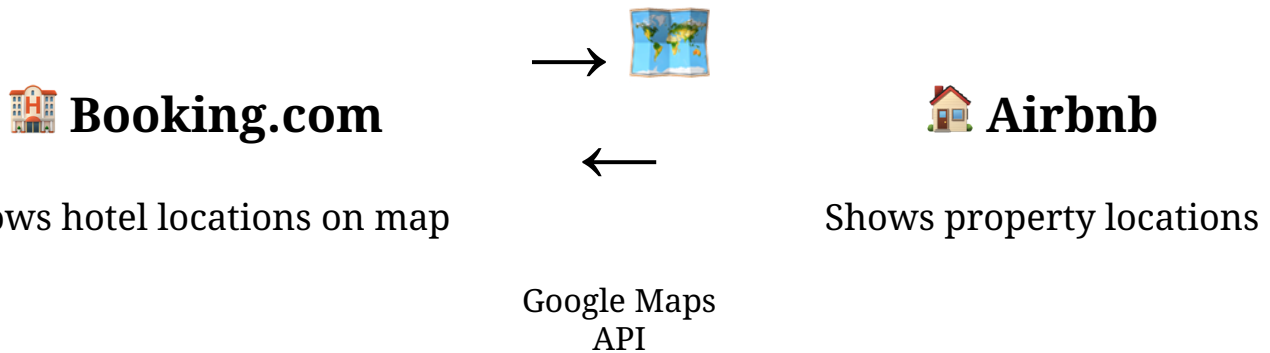
Real-World Example: Google Maps API



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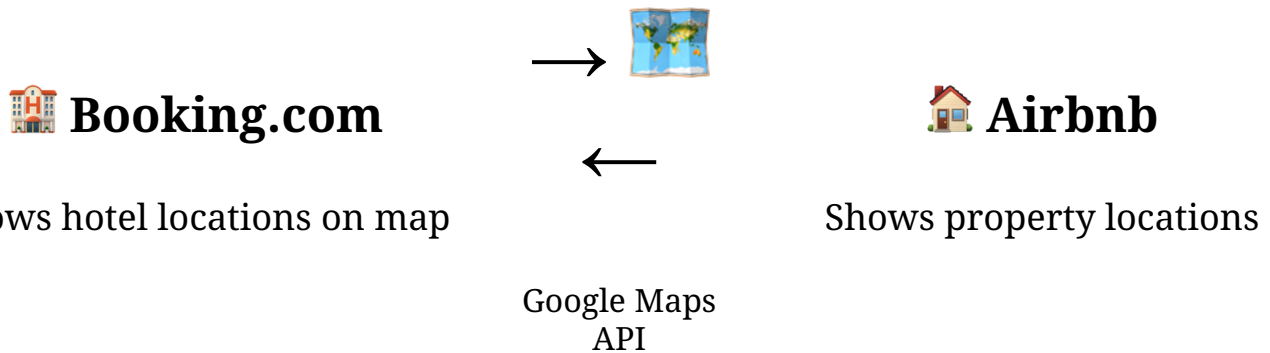

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Popular packages: `requests` (HTTP calls), `pandas` (data analysis), `openai` (AI services)

The Package Management Problem 

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Traditional Approach: Multiple Files + Virtual Environments

automation.py

```
import requests
      import pandas


# Your code here...
```

requirements.txt

```
requests==2.31.0
    pandas==2.0.1
    numpy==1.24.0
```

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```
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```

.python-version

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```

Tools: pipenv, conda, venv, poetry... **Confusing for beginners!**

Demo - The Package Management Problem

Enter UV: The Simple Solution ✨

UV = Python script runner + package manager in one

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UV = Python script runner + package manager in one

Everything in a single file!

```
# /// script
# requires-python = ">=3.11"
# dependencies = [
#     "requests==2.31.0",
#     "pandas==2.0.1",
# ]
# ///

import requests
import pandas as pd

# Your automation code here...
response = requests.get("https://api.example.com/data")
df = pd.DataFrame(response.json())
print(df.head())
```

UV: Single File vs Traditional Approach

Traditional 😓

- Create virtual environment
- Activate environment
- Install packages
- Manage requirements.txt
- Remember which env to use

📁 Multiple files

📚 Complex workflow

VS

UV 🚀

- Write your script
- Add dependencies at the top
- Run: `uv run script.py`

📄 One file

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Perfect for vibe scripting! → Learn more:
https://docs.astral.sh/uv/guides/scripts/

Demo - Vibe Scripting with UV + AI

The Vibe Scripting Workflow 🔄

🤖 **AI** → 💻 **CODE** → 📄 **file.py** → ⚡ `uv run file.py` → 👁️ **Review**

Does it solve your problem?

❌ No	✅ Yes
→ Back to AI 🤖 (refine & iterate)	→ Done! 🎉 (problem solved)

How to Use AI to Learn/Use Python

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

Learning Python with AI

Your Personal Programming Tutor

The Conversational Learning Approach

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- **Ask for explanations**: "What does this line do?" or "Why do we use a for loop here?"
- **Request variations**: "Show me 3 different ways to do this" or "Make this simpler"
- **Build incrementally**: Start with tiny scripts, then ask "How do I add X to this?"

Demo - Conversational Learning with AI for Python

ARUFS Framework

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Ask, **R**un, **U**nderstand, **F**ix, Be **S**afe

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- Be **S**afe → pittfalls & security risks

Ask

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- **Tools** to help with feeding data/repo into LLMs
  - https://github.com/yamadashy/repomix
  - gitingest
  - r.jina.ai
  - arxiv-txt.org
  - llms-txt
  - files-to-prompt
- Use **meta-prompts**:

```
I have this problem:
{describe the problem}
Help me write a good prompt that encapsulates this into a single Python script.
```

Ask

- For tough problems use **reasoning models**
    - Claude + Extended Thinking
    - O-series models from OpenAI
    - Gemini 2.5 Pro
    - DeepSeek R1

Run/Understand/Fix

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- **Feed the output of the terminal** to the AI and ask to fix it

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- **Respect rate limits** and website terms of service when scraping
- **Quick Safety Checklist**: Read code → Test with dummy data → Have backups → Use version control

Demo - Implementing the A.R.U.F.S Framework

Demo - Automating Data Extraction

Automating Data Extraction

- **Target Websites or Documents**: Identify patterns or structures (tables, IDs, HTML tags)

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- **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

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- **Visualization**: Creating simple charts or graphs to represent findings

Automating Slides

- Effective data wrangling for high quality slides

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- A Hybrid Approach: AI + Python Scripts

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- A Hybrid Approach: AI + Python Scripts
- Bulk Processing to save time

Automating the Browser

- **Tools**: `selenium`, `playwright`

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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

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- **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

Demo - Prompts, Tips & Tricks

Using AI != Slop

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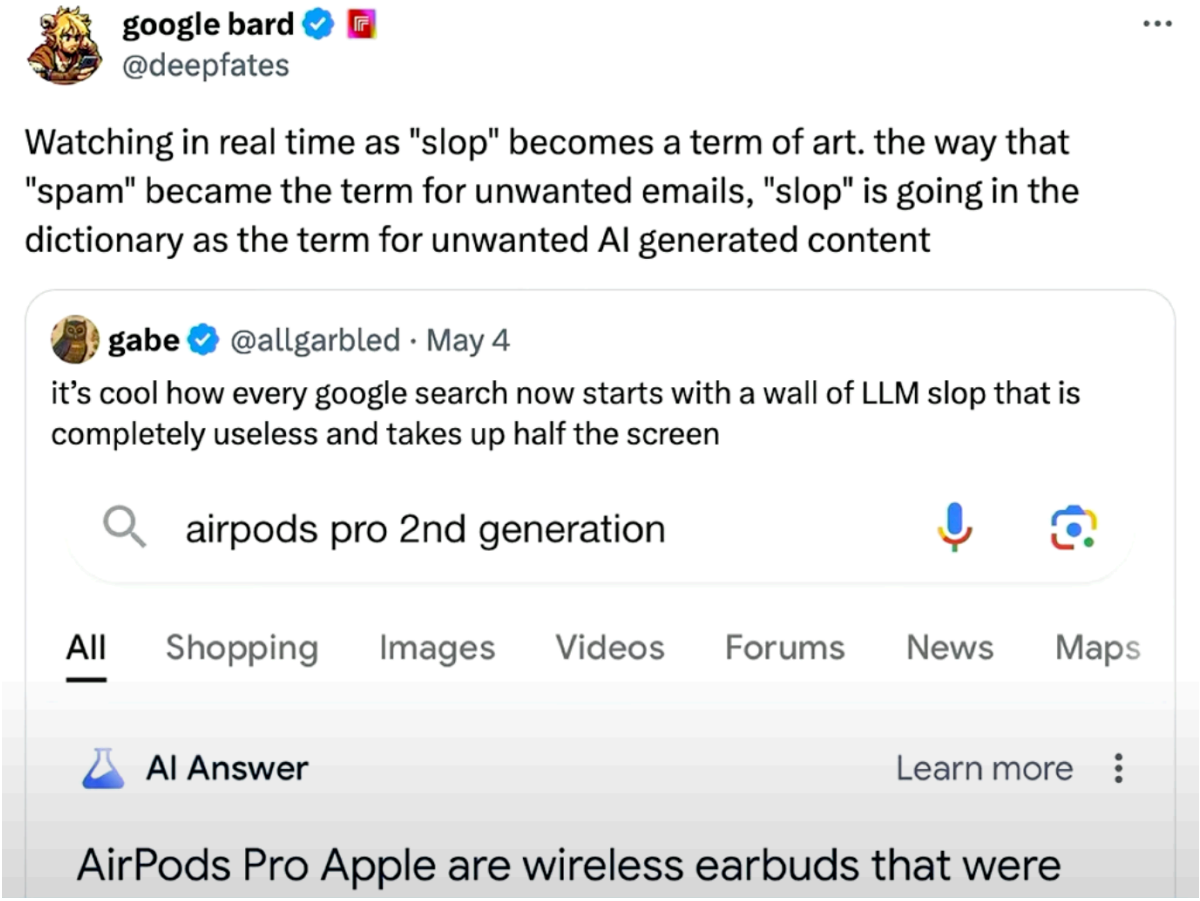
Slop is using unreviewed output (like code) from AI models



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Using AI != Slop

1. Working with AI involves having a system for effectively reviewing high quality outputs
2. Means having good systems for generating good outputs on the first place
3. Then learning to put in place a procedure for effective review and feedback on top of the outputs you get
4. **If it fixes your problem, it's working!**
    - The goal is to solve YOUR specific problem
    - Perfection is the enemy of done
    - A working automation that saves you time is better than a "perfect" solution that never ships

Connect With Me

 Course materials

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