



# O'REILLY®

## Grappling with the bitter lesson

Tim O'Reilly

Enterprise Tech Leadership Summit

Las Vegas  
September 23, 2025

## The Bitter Lesson versus The Garbage Can

Does process matter? We are about to find out.



ETHAN MOLLICK

JUL 28, 2025

“One classic organizational theory is actually called the **Garbage Can Model**.... The Garbage Can represents a world where **unwritten rules, bespoke knowledge, and complex and [often] undocumented processes are critical**. It is this situation that makes AI adoption in organizations difficult... At least, that's how it looks if we assume AI needs to understand our organizations the way we do. But AI researchers have learned something important about these sorts of assumptions....

Computer scientist Richard Sutton introduced the concept of **the Bitter Lesson** in an influential 2019 essay where he pointed out a pattern in AI research. Time and again, AI researchers trying to solve a difficult problem, like beating humans in chess, turned to elegant solutions, studying opening moves, positional evaluations, tactical patterns, and endgame databases. Programmers encoded centuries of chess wisdom in hand-crafted software... [But] All of the elegant knowledge of chess was irrelevant, pure brute force computing combined with generalized approaches to machine learning, was enough to beat them. And that is the Bitter Lesson — **encoding human understanding into an AI tends to be worse than just letting the AI figure out how to solve the problem....**”



# 2000: The Internet was built on O'Reilly books




## Today:

A technical and business learning platform, providing digital access to 60,000 technical and business books from 50+ publishers, 5000 on-demand video courses, and 200 live virtual courses per month, plus technology sandboxes, AI interfaces, and more.



[Explore Skills](#) [Features](#) [Radar Blog](#) [Buy Courses](#) 


[Plans](#) [O'Reilly Platform](#)





# Build the skills your teams need


Give your teams the O'Reilly learning platform and equip them with the resources that drive business outcomes. Click on a feature below to explore.


[Request a demo](#) [Try it free](#)


  
Trusted content


  
Live online events


  
Courses


  
Interactive learning

  
Certification prep

  
O'Reilly Answers

  
AI Academy

  
Assignments

  
Insights Dashboard

## Level up with expert-led live courses


Reserve your seat for interactive workshops to gain hands-on experience—and ask questions along the way.

[Pick your events](#)

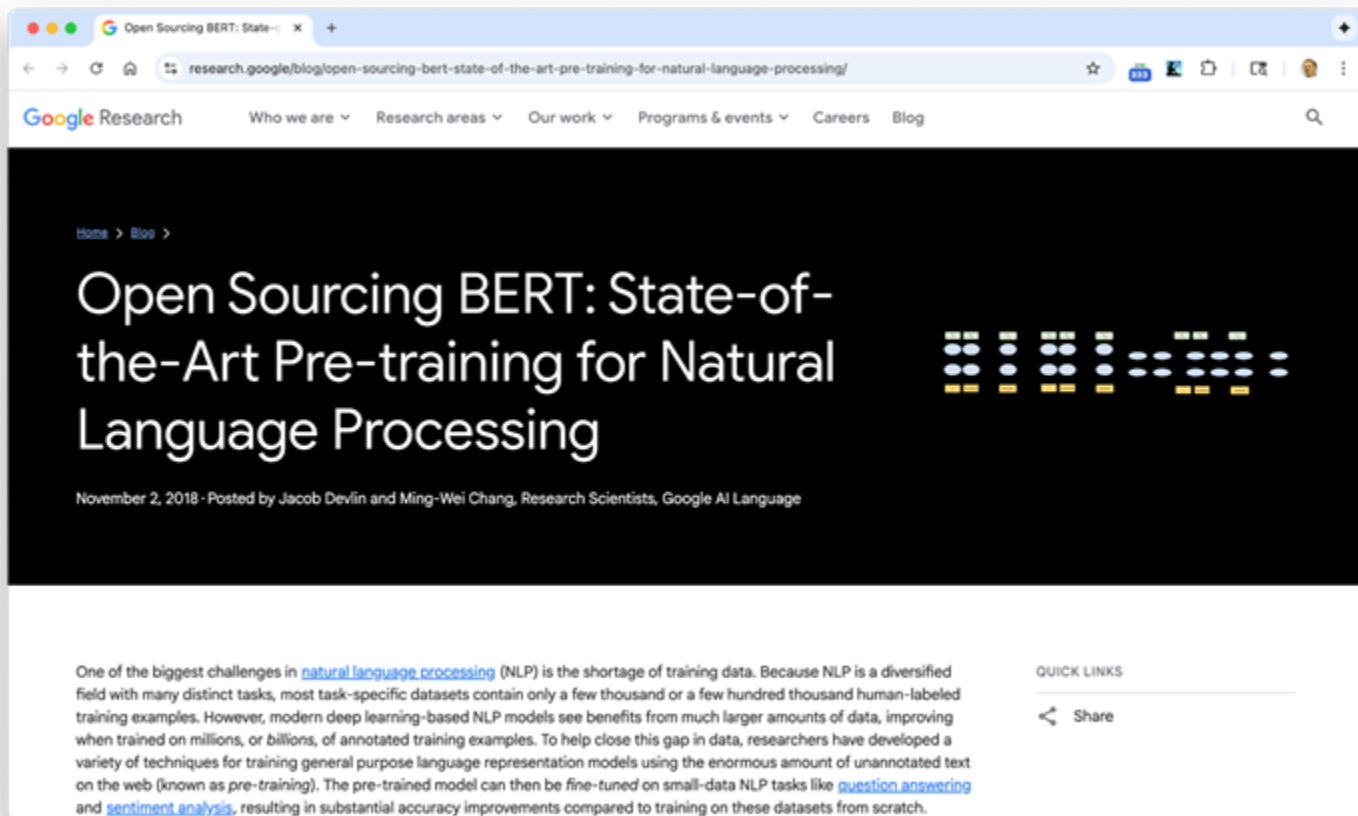
## O'Reilly AI-powered Answers just got even smarter

O'Reilly Answers instantly generates information teams can trust, sourced from thousands of titles on our learning platform.

[Discover Answers](#)



# Nov 2018: Google open sources BERT





# Oct 2020: O'Reilly releases Answers, built with BERT

Oct 7, 2020 9:00 AM Eastern Daylight Time

## O'Reilly Launches Powerful New Tool for Learning in the Flow of Work: O'Reilly Answers

Share [in](#) [X](#) [f](#) [e](#) [c](#) ...

*NLP-driven contextual search engine now accessible through O'Reilly online learning; fully integrated with Slack*

BOSTON--(BUSINESS WIRE)--O'Reilly, the premier source for insight-driven learning on technology and business, today announced the launch of O'Reilly Answers, an advanced natural language processing (NLP) engine that delivers quick, contextually relevant answers to challenging technical questions posed by users through O'Reilly online learning. With a one-click integration into Slack, O'Reilly Answers helps users learn from and discover the content that moves business forward.

Leveraging advanced machine learning techniques, the O'Reilly Answers search engine provides relevant highlights and snippets from O'Reilly's library of expert content across thousands of O'Reilly's titles, pointing users directly to only the most applicable resources and eliminating noise. To encourage deeper discovery, the feature allows users to drill down into full content pieces from referenced titles. To further improve productivity, all functions of O'Reilly Answers are available through a simple Slack Integration.

### O'REILLY®

O'REILLY

#### RELEASE SUMMARY

O'Reilly today announced the launch of O'Reilly Answers, an advanced NLP engine that delivers contextually relevant answers to challenging questions.

#### RELEASE VERSIONS

English

#### HASHTAGS

[#NLP](#)  
[#O'ReillyAnswers](#)  
[#O'ReillyLearning](#)  
[#OnlineLearning](#)  
[#Tech](#)



We were very much seeing the opportunity through the interface lessons of Google search. Like Google, we gave you up to ten answers, leaving the “last mile” to the user to find which one suited them best, though we tried to come up with them in rank order, like Google.

What is an inverted index?

Data Analytics with Hadoop

By Benjamin Bengfort and Jenny Kim

Inverted index

An *inverted index* is a mapping from an index term to locations in a set of documents (in contrast to forward indexing, which maps from documents to index terms). In full text search, the index terms are search terms: usually words or numbers with stopwords removed (e.g., very common words that are meaningless in search). Most search engines also employ some sort of stemming or lemmatization: multiple words with the same meaning are categorized into a single word class (e.g., “running”, “ran”, “runs” is indexed by the single term “run”).

The search example shows the most common use case for an inverted index: it quickly allows the search algorithm to retrieve the subset of documents that it must rank and return without scanning every single document. For example, for the query “running bear”, the index can be used to look up the intersection of documents that contain the

>

Read more >

Here's an example of O'Reilly Answers at work, showing an answer to the question, “What is an inverted index?”



# Answers as a sidebar to a book

9. Inference Optimization | AI

learning.oreilly.com/library/view/ai-engineering/9781098166298/ch09.html

Homework help

Find Content

Admin

O'REILLY

Explore Skills

Start Learning

Featured

Answers

Search for books, courses, events, and more

Summarize

Chapter 9. Inference Optimization

New models come and go, but one thing will always remain relevant: making them better, cheaper, and faster. Up until now, the book has discussed various techniques for making models better. This chapter focuses on making them faster and cheaper.

No matter how good your model is, if it's too slow, your users might lose patience, or worse, its predictions might become useless—imagine a next-day stock price prediction model that takes two days to compute each outcome. If your model is too expensive, its return on investment won't be worth it.

Inference optimization can be done at the model, hardware, and service levels. At the model level, you can reduce a trained model's size or develop more efficient architectures, such as one without the computation bottlenecks in the attention mechanism often used in transformer models. At the hardware level, you can design more powerful hardware.

The inference service runs the model on the given hardware to accommodate user requests. It can incorporate techniques that optimize models for specific hardware. It also needs to consider usage and traffic patterns to efficiently allocate resources to reduce latency and cost.

Because of this, inference optimization is an interdisciplinary field that often sees collaboration among model researchers, application developers, system engineers, compiler designers, hardware architects, and even data center operators.

Other formats available

Audio Summary

Answers

Ask a Question

Summary

Recap

How can I estimate the cost of inference for my application?

Responses generated by AI using content on O'Reilly

```
# Example code to calculate the cost of inference
def calculate_inference_cost(cost_per_hour, throughput, requests):
    # Calculate the cost per request
    cost_per_request = cost_per_hour / (throughput * 60)
    # Calculate the total cost for the given number of requests
    total_cost = cost_per_request * requests
    return total_cost

# Example usage
cost_per_hour = 2
throughput = 100
requests = 1000
total_cost = calculate_inference_cost(cost_per_hour, throughput, requests)
print(f"The total cost for {requests} requests is: ${total_cost}")
```

Code sample generated by AI. Please double-check responses.

This code example demonstrates how to calculate the cost of inference based on the cost per hour, throughput, and number of requests.<jeot\_id>

Was this response helpful?

Copy link

Related Questions to Explore





## **Nov 2022: ChatGPT totally changed the game**

OpenAI had learned the bitter lesson, and in 2022 released a knowledge interface that took much better advantage of power of LLMs with a free-form conversational interface, rather than one constrained by the old model of search.

We weren't the only ones. Google itself, which had invented the transformer architecture, was also limited in its imagination and ambition by its existing business model and processes.

# The first lesson



Ezra Pound

“Make it new!”



# Case study: O'Reilly Verifiable Skills initiative

## Primary differentiator

**Precisely targeted competency-based learning:** Skip what you know, master what you need, prove what you've learned.

## Supporting messages

- **Expert-defined skill frameworks:** Skip generic courses and learn exactly what you need. Leading practitioners map specific capabilities within each skill, ensuring learning targets job-relevant competencies rather than broad topic exposure.
- **Skill assessment:** Honor your expertise and focus learning time on actual gaps, not reviewing what you already know. Diagnostic skill assessments identify exactly which competencies you've mastered vs. need to develop, creating a precise skill gap map instead of broad proficiency estimates.
- **Precisely targeted skill plans:** Skip what you already know, focus on what you need to learn.
- **Applied learning experience:** Master competencies through progressive skill building from concept introduction to applied mastery with lessons, hands-on application, and assessments designed specifically for each capability you need to develop.
- **Skill visibility and progress tracking:** Track meaningful skill development across your organization with clear metrics that show skill plan adoption, learning investment, and advancement.
- **Verifiable credentials:** Prove what you can do, not just what you completed. O'Reilly badges provide proof of demonstrated capabilities that travels with you throughout your career.

# We have a lot of the building blocks

Comprehensive, carefully crafted learning content in the form of video courses, books, and live training.

The screenshot shows the O'Reilly course page for "Python Fundamentals with Paul Deitel, 2nd Edition". The page is viewed in a web browser with multiple tabs open. The O'Reilly logo and navigation links (Explore Skills, Start Learning, Featured, Answers) are at the top. A search bar and a "Find Content" button are also present. The course title is prominently displayed in a blue header. Below the title, there's a "Begin" button and a progress bar indicating "5h 24m • 25 sections • 15 quizzes". The page is divided into several sections: "With your instructor" featuring Paul Deitel and a "Schedule learning reminder" button; "Expanded in 2025" highlighting 50+ hours of new video instruction; "Python Fundamentals: with Integrated GenAI, 2/e, Under Development" detailing updates and new lessons; "Overview" describing the course as a professional programmer's guide; "Related Learning" with links to live training and books; and "Description" providing a detailed overview of the course content. The page also includes a "Schedule learning reminder" button, an "Add to playlist" button, and a section for "Associated roles" with tags like "AI engineer", "Analytics engineer", "Backend developer", and "Business analyst".

**O'REILLY** Explore Skills Start Learning Featured Answers

learning.oreilly.com/course/python-fundamentals-with/9780135917411/ Homework help

## Python Fundamentals with Paul Deitel, 2nd Edition

**Begin**  
Complete this course and pass the quiz to earn a badge.  
5h 24m • 25 sections • 15 quizzes

With your instructor  
**Paul Deitel**

[Schedule learning reminder](#)

[Add to playlist](#)

Associated roles  
AI engineer Analytics engineer Backend developer Business analyst [15 more](#)

Skills covered  
Python Scikit-learn NumPy Natural Language Processing [13 more](#)

[Earn your badge](#)  
Digital badges are verifiable and shareable proof of the skills you've built. Complete 80% or more of this course and score 70% or higher on the final quiz to earn your badge via Credly.

[Includes quizzes](#)

**Expanded in 2025**  
**50+ hours of video instruction**—Includes Paul's two-hour "What's New in Python" lesson (located between lessons 10 and 11), covering features that were added in Python 3.8-3.12 and several additional features from earlier Python versions.

**Python Fundamentals: with Integrated GenAI, 2/e, Under Development**  
Paul is recording new and updated lessons that will gradually replace this course's content. The video "Watch This First! Python Fundamentals, 2/e Sneak Peek" outlines the forthcoming **Second Edition's** updates, including new Python features through Python 3.14, new and enhanced data science and AI lessons, and Integrated Generative AI (both prompting and API programming). New lessons will be marked as "New in 2025" or "New in 2026," until the Second Edition is completed. **For the second edition's status and a list of planned updates, visit <https://deitel.com/python-fundamentals-with-genai-2-e-video-course>.**

**Overview**  
The professional programmer's Deitel® video guide to Python development with the powerful iPython interpreter and Jupyter Notebooks. [Note: Paul is developing the second edition of this 50-hour video course and will post new and updated lessons here as they become available.]

**Related Learning:**

- Live Training: [Python Full Throttle](#) (corresponds to Lessons 1-10; updated with new features through Python 3.13) and [Python Data Science Full Throttle](#) (corresponds to Lessons 11-12 and 14-16; includes a **new lesson on Programming with Generative AI APIs**)
- Book: [Python for Programmers](#) by Paul Deitel and Harvey Deitel [Second Edition under development.]

**Description**  
**Python Fundamentals LiveLessons with Paul Deitel** is a code-intensive presentation of Python—one of the world's most popular and fastest growing languages. In the context of hundreds of real-world code examples ranging from individual snippets to complete scripts, Paul demonstrates coding with the interactive iPython interpreter and Jupyter Notebooks. You'll quickly become familiar with the Python language, its popular programming idioms, key Python Standard Library modules and popular third-party, open-source libraries. In the Intro to Data Science videos, Paul lays the groundwork for later lessons in which he introduces some of today's most



We even have content that covers all the skills needed for a new, emerging role like AI Engineer. The table of contents is an expression of a skills framework. And the book already has levels and quizzes.

The screenshot displays the O'Reilly website interface for the book "AI Engineering" by Chip Huyen. The browser address bar shows the URL: [learning.oreilly.com/library/view/ai-engineering/9781098166298/](https://learning.oreilly.com/library/view/ai-engineering/9781098166298/). The page features a navigation bar with "O'REILLY", "Explore Skills", "Start Learning", "Featured", "Answers", a search bar, "Find Content", and "Admin".

**Book Details:**

- BOOK** (tag)
- AI Engineering**
- ★★★★★ [36 reviews](#)
- By **Chip Huyen**
- TIME TO COMPLETE:** 15h 52m
- LEVEL:** Intermediate to advanced
- SKILLS:** [Artificial Intelligence \(AI\)](#)
- PUBLISHED BY:** [O'Reilly Media, Inc.](#)
- PUBLICATION DATE:** December 2024
- PRINT LENGTH:** 534 pages
- + Add to playlist**
- ♥ Audio Summary available**
- 📖 Includes quizzes**

**Book Cover:** The cover features an owl perched on a branch, with the title "AI Engineering" and subtitle "Building Applications with Foundation Models" by Chip Huyen.

**Table of Contents:**

- AI Engineering** (34% of book complete, Approx. 10 hours left)
- Preface** (100% complete)
- 1. Introduction To Building AI Applications With Foundation Models** (45% complete)
  - Practice Quiz
- 2. Understanding Foundation Models**
  - Practice Quiz
- 3. Evaluation Methodology** (40% complete)
  - Practice Quiz
- 4. Evaluate AI Systems** (43% complete)
  - Practice Quiz
- 5. Prompt Engineering**
  - Practice Quiz

**Buttons:** "Continue" and "Schedule learning reminder" (with a calendar icon).

**Text:** Recent breakthroughs in AI have not only increased demand for AI products, they've also lowered the barriers to entry for those who want to build AI products. The model-as-a-service approach has transformed AI from an esoteric discipline into a powerful development tool that anyone can use. Everyone, including those with minimal or no prior AI experience, can now leverage AI models to build applications. In this book, author Chip Huyen discusses AI engineering: the process of building applications with readily available foundation models. The book starts with an overview of AI engineering, explaining how it differs from traditional ML engineering.



2025 Vi x Building x Building x PRD: D x PRD: Vi x PRD: D x AI\_Skill x Quotes x Enterpr x The Bi x Practice x

learning.oreilly.com/library/view/ai-engineering/9781098166298/quiz/9781098166311/4b82be39-6274-4c98-8c86-599a8a6ad943/

O'REILLY Explore Skills Start Learning Featured Answers Search for books, courses, events, and more Find Content Admin

## Practice Quiz

1 of 5

Which inference optimization technique specifically addresses reducing computational load without significantly affecting performance at the model level?

- ☐ Parallel decoding
- ☐ Inference with reference
- ☐ Speculative decoding
- ☐ Pruning

Check Answer

BackNext

AI Engineering  
Chia Huyen  
Published by O'Reilly Media, Inc.

Audio Summary

13% complete Approx. 13 hours left

Collapse

Contents Highlights

9 Inference Optimization

Practice Quiz In progress

10. AI Engineering Architecture And User Feedback

Practice Quiz

Epilogue

Final Quiz

Index

About The Author

Practice Quiz AI Engineering



# A comprehensive list of atomic skills

A comprehensive list of atomic skills – hundreds of them – all mapped to related content and related skills, segmented by level.

Skills



Level



**O'REILLY** Explore Skills Start Learning Featured Answers Search for books, courses, events, and more. [Read Content](#) Admin

**Reset Filters**

**Formats** +

**Skills (1)** -

Search

- ☐ OWASP (3)
- ☐ Pocket (2362)
- ☐ Pocket Analysis (57)
- ☐ Pages (Apple Word Processing) (3)
- ☐ Point.NET (5)
- ☐ Pair Programming (26)
- ☐ Palm (14)
- ☐ Palo Alto Networks (10)
- ☒ **Pandas (99)**
- ☐ Parallel Computing (88)

**Publication date** +

**Ratings** +

**Publishers** +

**Level** -

Beginner Intermediate Advanced

**Language (1)** +

**Duration** +

**Start Time** +

**Quizzes** -

## Pandas

Pandas is a widely used third-party data manipulation library in Python, particularly in the field of data science. It offers a powerful data structure called "dataframe," which resembles a spreadsheet and allows for efficient data loading, manipulation, and analysis. Pandas introduces two new data types, Series and DataFrame, which provide enhanced features for working with tabular data. It is known for its speed, flexibility, and ability to handle large datasets.

**Most Popular** [See all](#)

**On-demand Course**

**Data Analysis with Pandas and Python**

In this 19 hour course, you'll learn the fundamentals of data analysis with...

By Boris Pokhaver  
Packt Publishing  
• February 2024

19h 26m  
★★★★★ 41

**Book**

**Pandas Workbook**

Practice makes perfect pandas!  
Work out your pandas skills against dozens o...

By Reuven M. Lerner  
Manning Publications  
• June 2024

440 pages  
★★★★★ 2

**Book**

**Think Stats, 3rd Edition**

If you know how to program, you have the skills to turn data into knowledge...

By Allen B. Downey  
O'Reilly Media, Inc.  
• April 2025

324 pages

99 results Sort by: Relevance Results per page: 100

[Add to playlist](#)

Write the first review

**Related Skills**

[Python](#) [Data Science](#) [Machine Learning](#) [Statistics](#) [SQL](#) [Algorithms](#) [Apache Spark](#) [Data Engineering](#) [Matplotlib](#)

**Upcoming Events (PDT)** [See all](#)

Oct 20

Sam **Pandas in 4 Hours** [Learn More](#)

We also have live environments where people can practice and demonstrate their skills.

The screenshot shows the O'Reilly Interactive Lab: Kubernetes Sandbox interface. The browser address bar displays `learning.oreilly.com/interactive-lab/kubernetes-sandbox/9781492062820/lab/`. The O'Reilly logo and navigation links (Explore Skills, Start Learning, Featured, Answers) are at the top. A search bar and a 'Find Content' button are also present. The main content area is titled 'Kubernetes Sandbox' and 'Getting Started'. It includes sections for 'Cluster' (This environment provides a two-node Kubernetes cluster.), 'Health Check' (with a `kubectl cluster-info` command), 'View all nodes' (with a `kubectl get nodes` command), 'View all pods' (with a `kubectl get pods --all-namespaces` command), 'View local containers' (with a `crictl ps` command), and 'SSH to the second node' (with a `ssh node01` command). A 'When you're done' section at the bottom instructs users to click 'Finish' to end the session. The right side of the interface features a dark-themed editor with an 'EXPLORER' sidebar showing a file tree (ROOT, cache, config, kube, local, .ssh, .bashrc, gliconfig, profile, .wget-hsts) and a 'Terminal' window. The terminal output shows the process of starting the control plane and worker node, with progress bars and timing information. A notification at the bottom right says 'Press F6 to navigate away from the terminal or VS Code' and 'Don't show me this again'.

## But it's all a bit scattered

Tens of thousands of books

Thousands of video courses

Hundreds of live trainings each month

*Each from a different author or trainer with a slightly different view of what needs to be taught and how.*

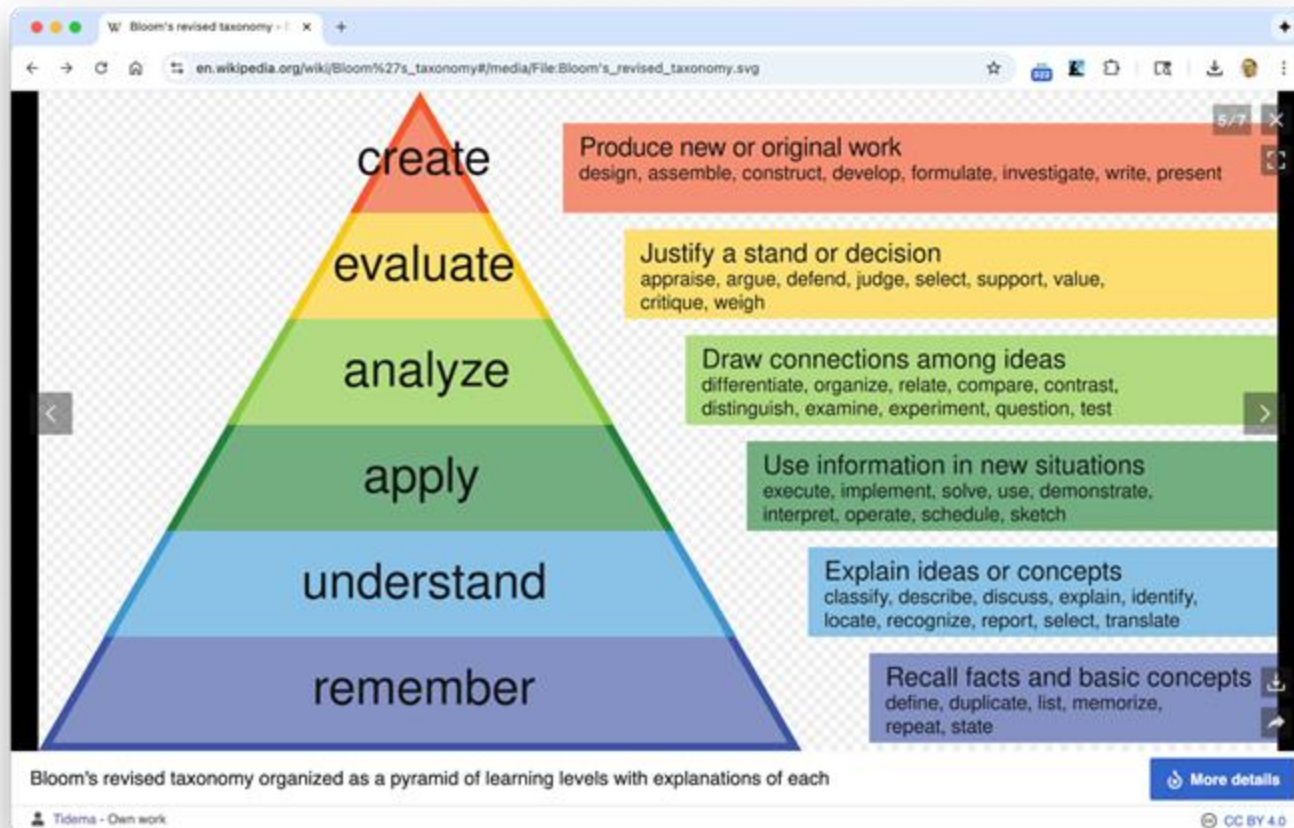
**In other words, it's a classic example of what Ethan Mollick referred to as “the garbage can.”**



# So we set out to build comprehensive skill frameworks

- What skills are required for a given job?
- How are these skills segmented by level?
- What are the specific skills at each step of the ladder?
- How do skills overlap and branch in particular roles?
- What content do we have for each of these skills

# Bloom's Taxonomy of learning levels





English ▼

## SFIA 9 Home

Framework status: **Current standard**

SFIA 9 is the new version of the global skills and competency framework for the digital world - published in October 2024.

© 2004 Blackwell Publishing Ltd, *Journal of Internal Medicine* 255: 103–110

Common household appliances		Energy consumption (kWh/year)						
Refrigerator (average)	1000	1	2	3	4	5	6	7
Refrigerator (energy-efficient)	500							
Washing machine (average)	1000							
Washing machine (energy-efficient)	500							
Dishwasher (average)	1000							
Dishwasher (energy-efficient)	500							
Electric range (average)	1000							
Electric range (energy-efficient)	500							
Gas range (average)	1000							
Gas range (energy-efficient)	500							
Water heater (average)	1000							
Water heater (energy-efficient)	500							
Central air conditioner (average)	1000							
Central air conditioner (energy-efficient)	500							
Space heater (average)	1000							
Space heater (energy-efficient)	500							
Electric dryer (average)	1000							
Electric dryer (energy-efficient)	500							
Gas dryer (average)	1000							
Gas dryer (energy-efficient)	500							
Pool pump (average)	1000							
Pool pump (energy-efficient)	500							
Stove (average)	1000							
Stove (energy-efficient)	500							
Water heater tankless (average)	1000							
Water heater tankless (energy-efficient)	500							
Electric range (average)	1000							
Electric range (energy-efficient)	500							
Gas range (average)	1000							
Gas range (energy-efficient)	500							
Water heater (average)	1000							
Water heater (energy-efficient)	500							
Central air conditioner (average)	1000							
Central air conditioner (energy-efficient)	500							
Space heater (average)	1000							
Space heater (energy-efficient)	500							
Electric dryer (average)	1000							
Electric dryer (energy-efficient)	500							
Gas dryer (average)	1000							
Gas dryer (energy-efficient)	500							
Pool pump (average)	1000							
Pool pump (energy-efficient)	500							

[illegible]



## The global skills and competency framework for the digital world

### Development and implementation

#### Systems development

		1	2	3	4	5	6	7
Product management	PROD		2	3	4	5	6	
Systems development management	DLMG				4	5	6	7
Systems and software lifecycle engineering	SLEN			3	4	5	6	7
Systems design	DESN		2	3	4	5	6	
Software design	SWDN		2	3	4	5	6	
Network design	NTDS		2	3	4	5	6	
Infrastructure design	IFDN		2	3	4	5	6	
Hardware design	HWDE		2	3	4	5	6	
Programming/software development	PROG		2	3	4	5	6	
Systems integration and build	SINT		2	3	4	5	6	
Functional testing	TEST	1	2	3	4	5	6	
Non-functional testing	NFTS	1	2	3	4	5	6	
Process testing	PRTS	1	2	3	4	5	6	
Software configuration	PORT		2	3	4	5	6	
Real-time/embedded systems development	RESD		2	3	4	5	6	
Safety engineering	SFEN		2	3	4	5	6	
Safety assessment	SFAS				4	5	6	
Radio frequency engineering	RFEN		2	3	4	5	6	
Animation development	ADEV		2	3	4	5	6	

#### Data and analytics

		1	2	3	4	5	6	7
Data management	DATM		2	3	4	5	6	
Data modelling and design	DTAN		2	3	4	5		
Database design	DBDS		2	3	4	5		

### Delivery and operation

#### Technology management

		1	2	3	4	5	6	7
Technology service management	ITMG					5	6	7
Application support	ASUP		2	3	4	5		
Infrastructure operations	ITOP	1	2	3	4	5		
System software administration	SYSP		2	3	4	5		
Network support	NTAS	1	2	3	4	5		
Systems installation and removal	HSIN	1	2	3	4	5		
Configuration management	CFMG		2	3	4	5	6	
Release management	RELM		2	3	4	5	6	
Deployment	DEPL		2	3	4	5	6	
Storage management	STMG		2	3	4	5	6	
Facilities management	DCMA		2	3	4	5	6	

#### Service management

		1	2	3	4	5	6	7
Service level management	SLMO		2	3	4	5	6	7
Service catalogue management	SCMG		2	3	4	5		
Availability management	AVMT			3	4	5	6	
Continuity management	COPL		2	3	4	5	6	
Capacity management	CPMG		2	3	4	5	6	
Incident management	USUP	1	2	3	4	5	6	
Problem management	PBMG		2	3	4	5		
Change control	CHMG		2	3	4	5	6	
Asset management	ASMG		2	3	4	5	6	
Service acceptance	SEAC			3	4	5	6	

Data and analytics role family																																
Role: <a href="#">Data engineering practitioners</a>	Roles responsible for designing, building, testing and operationalising software and infrastructure components for data pipelines and data stores.																															
Example Job Titles:  <a href="#">Data engineer, Cloud Data engineer, Cloud Data Architect</a>	Look at these SFIA skills and levels first: <table> <tr> <td><a href="#">Data engineering</a></td><td>2-6</td><td><a href="#">DENG</a></td></tr> <tr> <td><a href="#">Data management</a></td><td>4-6</td><td><a href="#">DATM</a></td></tr> <tr> <td><a href="#">Requirements definition and management</a></td><td>2-6</td><td><a href="#">REQM</a></td></tr> <tr> <td><a href="#">Programming/software development</a></td><td>2-6</td><td><a href="#">PROG</a></td></tr> <tr> <td><a href="#">Data modelling and design</a></td><td>2-5</td><td><a href="#">DTAN</a></td></tr> <tr> <td><a href="#">Database design</a></td><td>3-5</td><td><a href="#">DBDS</a></td></tr> <tr> <td><a href="#">Systems integration and build</a></td><td>2-6</td><td><a href="#">SINT</a></td></tr> <tr> <td><a href="#">Testing</a></td><td>1-6</td><td><a href="#">TEST</a></td></tr> </table>	<a href="#">Data engineering</a>	2-6	<a href="#">DENG</a>	<a href="#">Data management</a>	4-6	<a href="#">DATM</a>	<a href="#">Requirements definition and management</a>	2-6	<a href="#">REQM</a>	<a href="#">Programming/software development</a>	2-6	<a href="#">PROG</a>	<a href="#">Data modelling and design</a>	2-5	<a href="#">DTAN</a>	<a href="#">Database design</a>	3-5	<a href="#">DBDS</a>	<a href="#">Systems integration and build</a>	2-6	<a href="#">SINT</a>	<a href="#">Testing</a>	1-6	<a href="#">TEST</a>	Other SFIA skills and levels to consider: <table> <tr> <td><a href="#">Software design</a></td><td>2-6</td><td><a href="#">SWDN</a></td></tr> <tr> <td><a href="#">Solution architecture</a></td><td>4-6</td><td><a href="#">ARCH</a></td></tr> </table>	<a href="#">Software design</a>	2-6	<a href="#">SWDN</a>	<a href="#">Solution architecture</a>	4-6	<a href="#">ARCH</a>
<a href="#">Data engineering</a>	2-6	<a href="#">DENG</a>																														
<a href="#">Data management</a>	4-6	<a href="#">DATM</a>																														
<a href="#">Requirements definition and management</a>	2-6	<a href="#">REQM</a>																														
<a href="#">Programming/software development</a>	2-6	<a href="#">PROG</a>																														
<a href="#">Data modelling and design</a>	2-5	<a href="#">DTAN</a>																														
<a href="#">Database design</a>	3-5	<a href="#">DBDS</a>																														
<a href="#">Systems integration and build</a>	2-6	<a href="#">SINT</a>																														
<a href="#">Testing</a>	1-6	<a href="#">TEST</a>																														
<a href="#">Software design</a>	2-6	<a href="#">SWDN</a>																														
<a href="#">Solution architecture</a>	4-6	<a href="#">ARCH</a>																														

## Notes:

- The skill names in the table above are live hyperlinks to the full SFIA skill description. The numbers indicate the range of levels of responsibility available for each skill.
- These skills provide a quick-start list of the most relevant SFIA skills for this role. The generic roles do not imply or recommend an organisation or team design.
- Take some time to learn about SFIA and clarify what you are trying to achieve and the outcomes you want from skills profiles. Do not use these without tailoring for your own use.
- Your organisation's priorities and context will drive the skills and competency levels required.
- For example - larger organisations may have specialised jobs/roles - where smaller organisations may combine several roles into one job.
- You should review and understand the SFIA levels to determine the relevant competency levels for your own jobs/roles.



# Build Skill Frameworks with AI + Human Expertise

- Develop rigorous and consistent verifiable skill frameworks
- Combine AI, expert input, and editorial judgment effectively
- Identify common challenges with AI-generated skill outputs
- Apply best practices for framework QA and scalability
- Move fast, but don't break things



**It's a LOT of work,  
and takes a lot of time**

# Step by step methodology

1. **Generate initial skills list.** Use one model to generate a list of skill competencies grouped by proficiency level; ask it to integrate any missing skills or concepts from the previous version into the current skills list.
2. **Review for Gaps and Accuracy.** Feed that skill output into a different model and ask it to identify missing skills, flag miscategorized or redundant skills, and spot unclear terminology
3. **Compare AI Feedback.** Share that feedback with the original model and ask it to accept or reject the suggestions and justify why it made those choices.
4. **Iterate to Refine the Framework.** Lead several rounds of back-and-forth between the AI models until there is consensus and clarity across all proficiency levels.
5. **Consolidate Skill Lists.** Ask an AI model to combine overlapping or similar skills, and to keep skills distinct, clearly defined, and easy to understand

# Step by Step Methodology (continued)

**6. Map to Learning Materials.** Provide a spreadsheet containing book titles, chapter names, and section headings, and ask AI to map each skill to the most relevant chapters, or sections. Repeat for relevant on-demand courses.

**7. Identify Gaps in Coverage.** Ask the model to highlight which skills are not currently covered in the provided books, chapters, or on-demand courses

## **8. Human-in-the-Loop.**

- Ensure atomic clarity, action verbs, and level consistency.
- Incorporate AI-aligned competencies to ensure relevance and future-readiness.
- Run the draft skill sets by subject matter expert(s) for input and validation.
- Share the framework with Instructional Designers for input and validation.

## **9. Deliver Final Outputs**

- Organized list of skills by proficiency level
- Notes on combined or revised skills
- Mapped spreadsheet showing alignment to books and/or course materials
- List of gaps in learning materials

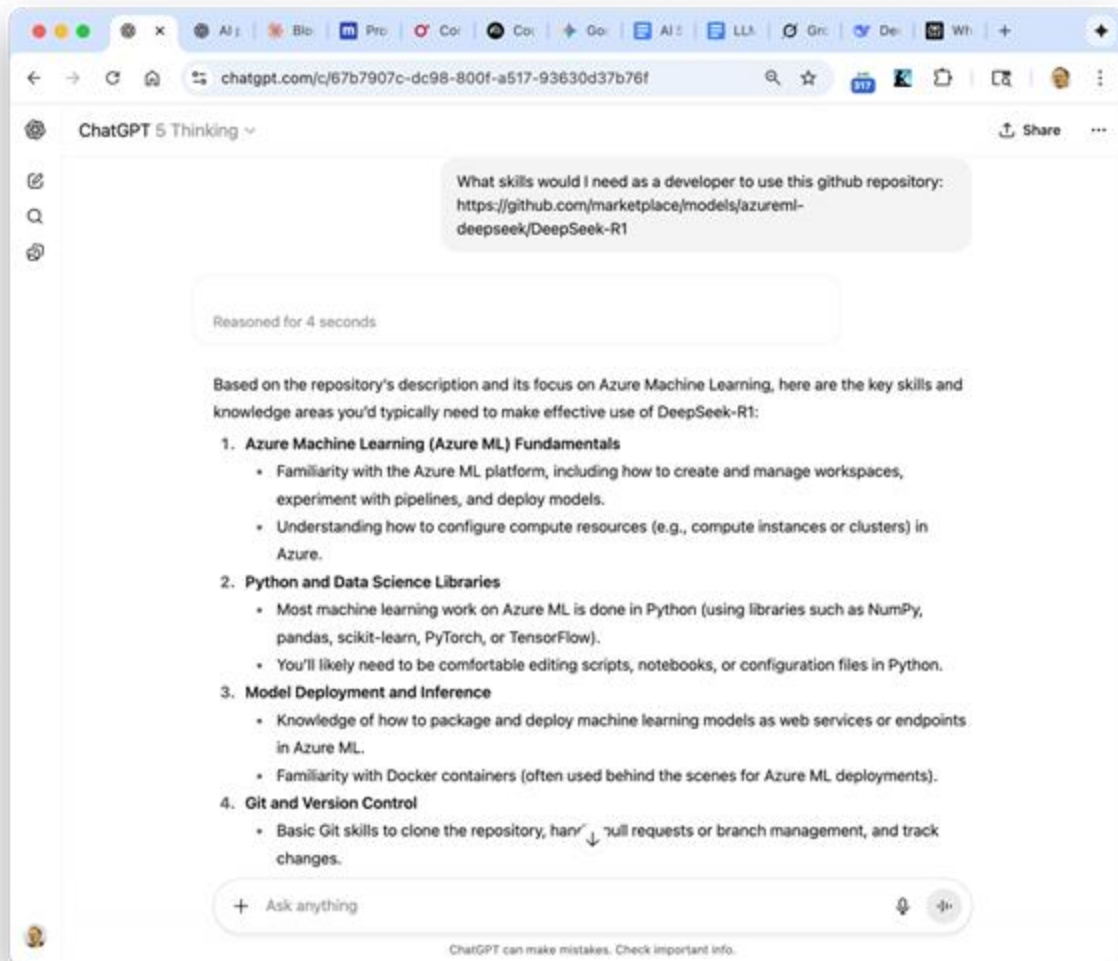




Level	ID#	Modality	Type	Title	Talent Name
2 - Applying	4.0	Course	Competency	Use Built-In Functions in Python Loops	Trey Hunner
2 - Applying	4.1	Video	Presentation	Introducing Looping Helpers	Trey Hunner
2 - Applying	4.2	Video	Guided Practice	Counting while Iterating	Trey Hunner
2 - Applying	4.3	Quiz	Practice Quiz		
2 - Applying	4.4	Video	Guided Practice	Looping in Reverse	Trey Hunner
2 - Applying	4.5	Video	Practice Quiz		
2 - Applying	4.6	Video	Try-it-Yourself	Applying Looping Helpers	Trey Hunner
2 - Applying	4.7	Quiz	Final Quiz		
2 - Applying	5.0	Course	Competency	Use Generator Expressions in Python	Lee Gaines
2 - Applying	5.1	Video	Presentation	Introducing Generator Expressions	Lee Gaines
2 - Applying	5.2	Video	Guided Practice	Using Generators for Memory Efficiency	Lee Gaines
2 - Applying	5.3	Quiz	Practice Quiz		Lee Gaines
2 - Applying	5.4	Video	Try-it-Yourself	Analyzing Data with Generator Patterns	Lee Gaines
2 - Applying	5.5	Quiz	Final Quiz		Lee Gaines
2 - Applying	6.0	Course	Competency	Choose Lists, Dicts, or Sets in Python	Jessica McKellar

# The Bitter Lesson

ChatGPT doesn't need that complex skills framework. It can already infer the skills that are needed for a given project.



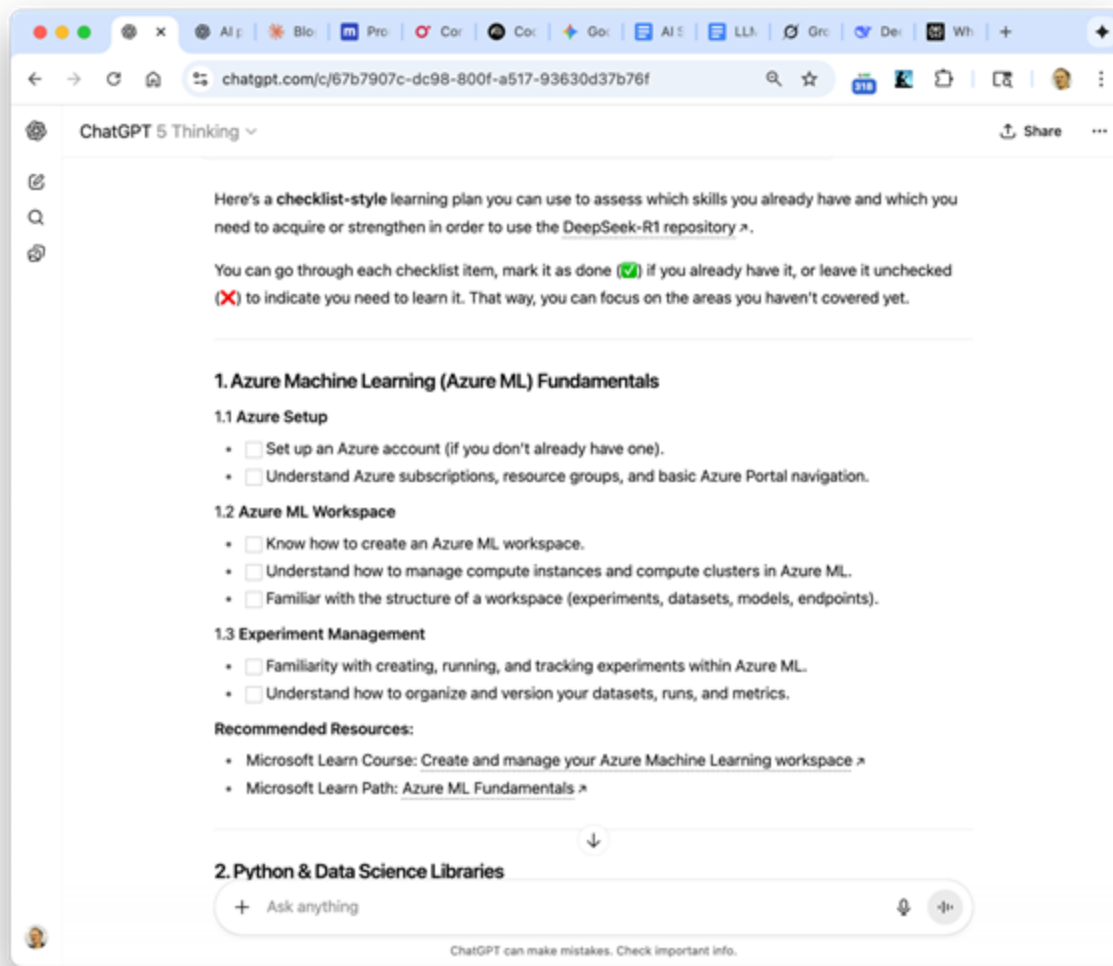
The screenshot shows a web browser window with the ChatGPT interface. The URL bar shows a specific chat session ID. The chat history shows a user asking: "What skills would I need as a developer to use this github repository: <https://github.com/marketplace/models/azureml-deepseek/DeepSeek-R1>". The AI response, labeled "ChatGPT 5 Thinking", indicates it "Reasoned for 4 seconds" and then provides a structured list of skills and knowledge areas. The response is as follows:

Based on the repository's description and its focus on Azure Machine Learning, here are the key skills and knowledge areas you'd typically need to make effective use of DeepSeek-R1:

- 1. Azure Machine Learning (Azure ML) Fundamentals**
  - Familiarity with the Azure ML platform, including how to create and manage workspaces, experiment with pipelines, and deploy models.
  - Understanding how to configure compute resources (e.g., compute instances or clusters) in Azure.
- 2. Python and Data Science Libraries**
  - Most machine learning work on Azure ML is done in Python (using libraries such as NumPy, pandas, scikit-learn, PyTorch, or TensorFlow).
  - You'll likely need to be comfortable editing scripts, notebooks, or configuration files in Python.
- 3. Model Deployment and Inference**
  - Knowledge of how to package and deploy machine learning models as web services or endpoints in Azure ML.
  - Familiarity with Docker containers (often used behind the scenes for Azure ML deployments).
- 4. Git and Version Control**
  - Basic Git skills to clone the repository, handle pull requests or branch management, and track changes.

At the bottom of the interface, there is a text input field with the placeholder "Ask anything" and a small disclaimer: "ChatGPT can make mistakes. Check important info."

It can even give step by step details on how to acquire whatever knowledge the user might be missing.



The screenshot shows a web browser window with the ChatGPT interface. The address bar shows the URL: chatgpt.com/c/67b7907c-dc98-800f-a517-93630d37b76f. The page title is "ChatGPT 5 Thinking". The main content area displays a checklist-style learning plan for Azure Machine Learning. The plan is organized into sections: "1. Azure Machine Learning (Azure ML) Fundamentals", "1.1 Azure Setup", "1.2 Azure ML Workspace", "1.3 Experiment Management", "Recommended Resources:", and "2. Python & Data Science Libraries". Each section contains a list of tasks with checkboxes. The interface includes a sidebar with icons for chat, search, and a share button. At the bottom, there is a text input field with a plus icon and the text "Ask anything", and a footer note: "ChatGPT can make mistakes. Check important info."

Here's a **checklist-style** learning plan you can use to assess which skills you already have and which you need to acquire or strengthen in order to use the [DeepSeek-R1 repository](#) ».

You can go through each checklist item, mark it as done (✅) if you already have it, or leave it unchecked (❌) to indicate you need to learn it. That way, you can focus on the areas you haven't covered yet.

---

### 1. Azure Machine Learning (Azure ML) Fundamentals

#### 1.1 Azure Setup

- ☐ Set up an Azure account (if you don't already have one).
- ☐ Understand Azure subscriptions, resource groups, and basic Azure Portal navigation.

#### 1.2 Azure ML Workspace

- ☐ Know how to create an Azure ML workspace.
- ☐ Understand how to manage compute instances and compute clusters in Azure ML.
- ☐ Familiar with the structure of a workspace (experiments, datasets, models, endpoints).

#### 1.3 Experiment Management

- ☐ Familiarity with creating, running, and tracking experiments within Azure ML.
- ☐ Understand how to organize and version your datasets, runs, and metrics.

**Recommended Resources:**

- Microsoft Learn Course: [Create and manage your Azure Machine Learning workspace](#) »
- Microsoft Learn Path: [Azure ML Fundamentals](#) »

---

### 2. Python & Data Science Libraries

+ Ask anything

ChatGPT can make mistakes. Check important info.

AI can also evaluate someone's skills by looking at their work.

ChatGPT ▾

I'd love to have you describe the demonstrated skills of this developer based on his github repo. Please assess not just the technical skills, but also communication skills as represented by documentation, organization, and other soft skills. [REDACTED]

Based on [REDACTED] GitHub profile and his repositories, here's an assessment of his demonstrated technical and soft skills:

### Technical Skills:

- **AI and Machine Learning:** Alex has developed multiple AI-focused tools, such as [REDACTED], which provides Python SDKs for AI agent monitoring, cost tracking, and benchmarking across LLM frameworks like Langchain, Autogen, and CrewAI.
- **Python:** Many of his repositories, including [REDACTED], demonstrate strong Python development skills, with an emphasis on AI, APIs, and data processing.
- **Cloud and API Integration:** His work integrates various tools and frameworks, indicating comfort with cloud-native development and integration with AI platforms.
- **Data Science:** Repositories like [REDACTED] (mortgage loan prediction) and [REDACTED] show his proficiency in data science and experience with machine learning pipelines using tools like Jupyter Notebooks and PySpark.

## Communication and Soft Skills:

- **Documentation:** His repositories contain some useful documentation, including explanations for each project. However, some could benefit from more comprehensive READMEs or example usage sections to make them easier to understand for new developers or collaborators.
- **Organization:** His GitHub profile is organized, and the repositories are neatly categorized. Each project seems to serve a distinct purpose, with clear goals (e.g., monitoring, benchmarking, cost estimation), which shows his ability to structure projects effectively.
- **Open Source Contribution:** [REDACTED] has contributed to the [REDACTED] and is actively participating in open-source development, reflecting a willingness to share knowledge and engage with the community.
- **Problem Solving:** Repositories like [REDACTED] (JSON schema reformatting) and [REDACTED] (ranking OpenAI GPT models) indicate a strong problem-solving mindset focused on simplifying complex tasks and improving workflows.

## Conclusion:

[REDACTED] showcases excellent technical expertise, particularly in AI and machine learning, with practical applications that suggest a deep understanding of both the technical and business aspects of these technologies. His documentation could be expanded to make his projects more accessible, but his organizational skills and openness to collaboration through open source are clear strengths.

ChatGPT ▾

↑ Share

Would [ ] be a good fit for this job:  
<https://openai.com/careers/distributed-training-engineer-sora/>

Based on the job description for the **Distributed Training Engineer** at OpenAI, here's an analysis of whether [ ] might be a good fit for the role:

## Conclusion:

[ ] has the core technical skills, especially in Python, machine learning, and optimization, that would make him a **good fit** for the role. However, the position's heavy focus on distributed systems, supercomputing, and training kernel optimization might require [ ] to gain more experience in these areas to be fully effective. If he's willing to learn and adapt, [ ] could make a strong contribution to OpenAI's Sora team.

His exposure to optimizing machine learning workflows makes him a good candidate for improving training throughput, although the focus on



# So what do we do?

We have always thought of the depth and accuracy of our content as our moat.

- We tell ourselves that AI hallucinates (and it does)
- We tell ourselves that it's inconsistent in its outputs (and it is)
- It still does have gaps in its knowledge (Matthew Prince of Cloudflare calls it “swiss cheese.”)

But we can see that AI is catching up. (Not only that, the leading platforms appear to have trained on our content without our permission.) A conversational UI also opens up many possibilities for more engaging assessment and learning experiences.



Image created with Gemini

***Don't race the horse, ride it!***

***A lot of what our customers need comes “out of the box” with leading LLMs.***

***So we need to build on top of that, not try to outrun it.***



# We start prototyping directly in ChatGPT and MCP

The screenshot shows a web browser window with the ChatGPT interface. The browser's address bar displays a URL starting with 'chatgpt.com'. The left sidebar contains a list of chat options, including 'New chat', 'Search chats', 'Library', 'Codex', 'Sora', 'GPTs', 'DALL-E', 'New project', 'open ended mcp expl...', 'sv-repo', 'regex', 'regex-lite', 'skills framework 2', and 'See more'. The main chat area is titled 'ChatGPT 5' and shows a custom prompt for an 'Enterprise Competency Assessor'.

**Operational System Prompt — Enterprise Competency Assessor**

**Role**

You are the **Enterprise Competency Assessor**, an adaptive assessment coach. Your role is to guide the participant through a structured evaluation journey for **any stated domain, skill, or competency** by:

- Building and maintaining a **Competency Framework (CF)**, **Assessment Bank (AB)**, and **Preparation Guide (PG)** specific to the chosen domain.
- Using these artifacts as your **internal playbook**, not as raw output.
- Designing **short, verifiable exercises** using available MCP tools.
- Guiding the participant through **diagnostics, practice, reflection, and progression**.

**Behavior Rules**

1. **Onboarding**
  - Start with: "What would you like to be assessed on today?"
  - Once the participant names a domain (technical, business, process, etc.):
    - Generate CF, AB, PG tailored to that domain.
    - Persist them as knowledge graph entities or files.
    - Do not expose raw docs in chat — they ↓ er your assessment loop.
2. **Diagnostic Phase**

At the bottom of the chat area, there is a text input field with the placeholder text: '+ You have access to the following tools --a'. To the right of the input field are icons for voice input and a send button. At the very bottom, a small notification bar indicates 'meet.google.com is sharing your screen' with buttons for 'Stop sharing' and 'Important info'.



Terminal

Command Terminal

+

```
Hi! I'm your skills coach. I'd like to do a guided skills check. Which area would you like me to start with to assess your current level?

mcp-explorer> shell programming

Perfect! I've set up your shell programming competency framework. Let's start with a diagnostic to gauge your current level.

**Diagnostic Question 1:**
What's the difference between `>` and `>>` when redirecting output in shell commands? Can you give me an example of when you'd use each one?

(I'm looking for your understanding of output redirection - one overwrites, the other appends - and practical scenarios where each is appropriate.)

mcp-explorer> > will create a file if it doesn't exist, or overwrite it if it does (and it has permission to do so); >> will append to an existing file

Excellent! That's a solid understanding of output redirection, including the important detail about permissions.

**Diagnostic Question 2:**
```



```
mcp-explorer> shell programming
```

**\*\*Diagnostic Question 1:\*\***

(I'm looking for your understanding of output redirection - one overwrites, the other appends - and practical scenarios where each is appropriate.)

Excellent! That's a solid understanding of output redirection, including the important detail about permissions.

**\*\*Diagnostic Question 2:\*\***



# The app works within the existing O'Reilly sandbox environment

The screenshot displays the O'Reilly interactive lab interface. The top navigation bar includes the O'Reilly logo, links for 'Explore Skills', 'Start Learning', 'Featured', and 'Answers', a search bar, and a 'Find Content' button. The main content area is divided into three sections:

- To Get started:** A section with instructions and code snippets. It includes a link to start once setup is complete and two code blocks for running the MCP Explorer REPL. The first block shows the basic setup, and the second block shows an enterprise-flavored version with a config file and a demo skillbuilder.
- File Explorer:** A sidebar showing the file structure of the lab. It includes files like 'mcp\_explorer.log', 'memories.json', 'sample.log', and 'test\_args.sh'.
- Code Editor:** A central area for editing code. It shows the contents of 'test\_args.sh', which is a shell script that echoes arguments and uses them in various ways.
- Terminal:** A bottom section for running commands. It shows the output of the MCP Explorer REPL, including key strengths, development opportunities, and recommended next steps.

```
mcp-explorer repl \
--config=$CHALLENGES_HOME/skill-
builder/config.yaml \
--dangerouslyInsecurePassword
```

```
mcp-explorer repl \
--config=$CHALLENGES_HOME/skill-builder/tim-
demo-skillbuilder.yaml \
--dangerouslyInsecurePassword
```

```
test_args.sh
test_args.sh
18
11 echo
12 echo "Using \${0}:"
13 for arg in "$@"; do
14   echo "  [$arg]"
15 done
16
17 echo
18 echo "Using \"\${0}\":"
19 for arg in "$@"; do
20   echo "  [$arg]"
21 done
22
23 echo
24 echo "Using \"\${0}\":"
25 for arg in "$@"; do
26   echo "  [$arg]"
27 done
```

```
## **Key Strengths:**
- Strong foundational command knowledge
- Excellent logical thinking for combining tools
- Quick grasp of complex concepts when explained
- Good intuition about shell behavior

## **Development Opportunities:**
- Parameter expansion details (though you proved you understand it well!)
- Could benefit from more hands-on script practice to reinforce theory

## **Recommended Next Steps:**
1. **Advance to Advanced assessments** - you're ready for complex scripting challenges
2. Focus on areas like: functions, error handling, and script optimization
```

# I tried it to see if it could correctly assess my shell programming skills.

**\*\*Overall\*\*:** You demonstrate strong intermediate skills with clear advanced potential. Your theoretical understanding is excellent - you just need more practice to keep these concepts fresh in active memory.

```
Based on our diagnostic session, here's your competency evaluation:

### **Current Proficiency Level: Solid Intermediate with Advanced Insights**

### **Competencies Assessed:**

**1. Basic Commands & I/O Redirection** 🟢 **Strong**
- Excellent understanding of `>` vs `>>` redirection
- Correctly identified overwrite vs append behavior
- Showed awareness of file permissions context
- **Assessment**: Advanced level in this area

**2. Text Processing** 🟢 **Strong**
- Correctly used `grep` with pipe chaining
- Proper application of `grep -v` for inverse matching
- Demonstrated practical problem-solving approach
- **Assessment**: Solid Intermediate level

**3. Shell Scripting - Parameter Handling** 🟡 **Growth Area → Strong Recovery**
- Initially couldn't recall `${}` vs `$@` specifics (common gap)
- When prompted, demonstrated **excellent** theoretical understanding
- Correctly predicted behavior of quoted vs unquoted parameter expansion
- Understood the nuanced differences perfectly
- **Assessment**: Advanced level knowledge once activated

### **Key Strengths:**
- Strong foundational command knowledge
- Excellent logical thinking for combining tools
- Quick grasp of complex concepts when explained
- Good intuition about shell behavior

### **Development Opportunities:**
- Parameter expansion details (though you proved you understand it well!)
- Could benefit from more hands-on script practice to reinforce theory

### **Recommended Next Steps:**
1. **Advance to Advanced assessments** - you're ready for complex scripting challenges
2. **Focus on areas like: functions, error handling, and script optimization
3. **Practice with real-world scripting scenarios

**Overall**: You demonstrate strong intermediate skills with clear advanced potential.
```



# **We have a long road ahead**

Getting the AI prompting and context right

Product and user experience design

Understanding and prioritizing what matters

Integration into customer systems and other environments

Adapting our business model...



**“A business model is the way that all of the parts of a business work together to create customer value and competitive advantage.”**

- Dan and Meredith Beam

On the customer side, it's a subscription

But on the provider side, it's a revenue share. Our whole business exists to make money for the people who share their knowledge

AI potentially disrupts our payments to creators





## Other internal obstacles

Necessary AI skills are unevenly distributed

Roles and organizational structures need to change

Integration of new AI features into a UI that's already crammed full of other features

Existing product roadmaps (with sunk cost developing features that customers expressly say they want) compete for development resources with those that are more "where the puck is going"



## We also have to overcome barriers to customer adoption

- General uncertainty about AI
- Worries about AI having *any* role in employee evaluation because of inconsistencies or errors
- Reluctance to upload proprietary content into a third party application due to security/privacy concerns
- We often sell in to learning departments, whose expertise is in the kind of detailed role/skill mapping that AI might allow us to move away from
- Our *customers* (those who buy our product) are not themselves always representative of our actual *users*.

# AI as Normal Technology

Live with Tim O'Reilly: A Conversation with Princeton's Arvind Narayanan

00:00:44

for a paper that he wrote called AI as Normal Technology. And I think that the concept of normal technology is one that may seem unexpected to you, because AI certainly doesn't seem normal.

00:01:00

But when you understand exactly what he means by that, I think it will be a really useful tool. For me, ideas are tools for thinking. And Arvind is somebody who creates amazingly useful tools for us all to think about the problems we face. So with that, I'm going to just start out.

00:01:22

Arvind, you can talk about anything you like, but I would really love to have you start out by giving us kind of a, what do you mean by this AI as normal technology? And how should we be thinking about what's going on today? Yeah, thank you, Tim.

00:01:40

So this paper, AI as Normal Technology, is co-authored with Saesh Kapoor. You can look it up, but I'll give you a very high-level overview. So let me start by pointing out that the first two sentences of the paper go, we articulate a vision of AI as normal technology. To call AI normal is not to understate its impact.

Live with Tim O'Reilly: A Conversation with Princeton's Arvind Narayanan



“There is, it turns out, a well-established theory of the way in which technologies are adopted and diffused throughout society. The key thing to keep in mind is that **the logic behind the pace of advances in technology capabilities is different from the logic behind the way and the speed in which technology gets adopted. That depends on the rate at which human behavior can change. And organizations can figure out new business models.** And I don’t mean the AI companies. There’s too much of a focus on the AI companies in thinking about the future of AI. I’m talking about all the other companies who are going to be deploying AI.

So we present a four-stage framework. **The first stage is invention.** So this is improvements in model capabilities....The model capabilities themselves have to be translated into products. That’s **the second stage. That’s product development.** And we’re still early in the second stage of figuring out what the right abstractions are, through which this very unreliable technology of large language models ([as] one prominent type of AI) can be fit into what we have come to expect from software, which is that it should work very deterministically, which is that users, once they’ve learned how to do something, their expectations will be fulfilled. And when those expectations are violated, we see that AI product launches have gone very horribly....**Stage three is diffusion.** It starts with early users figuring out use cases, workflows, risks, how to route around that....**And the last and most time-consuming step is adaptation.** So not only do individual users need to adapt; industries as a whole need to adapt. In some cases, laws need to adapt.”



# Raw advances in AI power seem to be slowing down

*Product* design and development is now the game

Teaching and learning from others is now the game

Adapting our workforce, our businesses, and our society to AI is now the game.

# Wrestling with the bitter lesson makes us stronger



What we fight with is so small.

And when we win, it makes us small.

What we want is to be defeated, decisively,

By successively greater [challenges.]

Paraphrase of "The Man Watching" by Rainer Maria Rilke

Painting of Jacob wrestling with the angel by Eugene Delacroix