



Generative AI will Transform Computing

JULES WHITE

SENIOR ADVISOR TO THE CHANCELLOR ON
GENERATIVE AI

PROFESSOR, COMPUTER SCIENCE

Coursera Course(s) on Prompt Engineering

I launched some of the first Coursera courses on Prompt Engineering for Generative AI targeted at anyone, regardless of skill.

495,000+ students to date across the courses

<https://www.coursera.org/learn/prompt-engineering>



Prompt Engineering for ChatGPT

This course is part of multiple programs. [Learn more](#)



Instructor: [Dr. Jules White](#) Top Instructor

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6 modules

Gain insight into a topic and learn the fundamentals.

4.8 ★

(3,579 reviews)

Beginner level

Recommended experience ⓘ

Flexible schedule

Approx. 18 hours
Learn at your own pace

Iterative Refinement Through Conversation

You wouldn't necessarily expect a human to know exactly what you want immediately.

The key to prompting is to have "conversations" where you iteratively refine the output.

JU


Please create a meal plan for my family that is based on a fusion of food from Ethiopia and Uzbekistan. I want to eat Keto and up to 2000 calories per day. Pick dishes where the ingredients are easy to get from an average US grocery store.

Model: Default (GPT-3.5)

JU

Please create a meal plan for my family that is based on a fusion of food from Ethiopia and Uzbekistan. I want to eat Keto and up to 2000 calories per day. Pick dishes where the ingredients are easy to get from an average US grocery store.



Here is a sample meal plan that combines flavors from Ethiopia and Uzbekistan while also being Keto-friendly and within a 2000 calorie per day limit: 

Day 1

- Breakfast: Scrambled eggs with sautéed onions, tomatoes, and Ethiopian berbere spice mix (made with chili powder, paprika, garlic powder, ginger, cumin, and coriander). Serve with a side of sliced avocado.
- Lunch: Uzbek-style lamb kebabs with grilled vegetables (bell peppers, zucchini, and eggplant) and a side of cucumber and tomato salad dressed with olive oil and lemon juice.

Model: Default (GPT-3.5)

JU

Can you give me an approximate serving size for myself for each dish that is within my 2000 calorie limit?

OpenAI : ChatGPT 3.5

Model: Default (GPT-3.5)

JU

Can you give me an approximate serving size for myself for each dish that is within my 2000 calorie limit?



Sure, here are approximate serving sizes for each dish based on a 2000 calorie per day limit:



Day 1

- Breakfast: Scrambled eggs with sautéed onions, tomatoes, and Ethiopian berbere spice mix (2 eggs, 1/2 cup onions, 1/2 cup tomatoes, 1 tsp berbere spice mix). Serve with a side of sliced avocado (1/4 medium avocado).
- Lunch: Uzbek-style lamb kebabs with grilled vegetables (4 oz lamb, 1 cup mixed vegetables) and a side of cucumber and tomato salad dressed with olive oil and lemon juice (1 cup salad).
- Dinner: Ethiopian doro wat (spicy chicken stew) served over cauliflower rice (4 oz

Model: Default (GPT-3.5)

JU

My son is 9. Sometimes he won't try new dishes. To make this culinary adventure more fun for him, can you create a short Pokémon battle story to go with each dish? I will read the stories with him before dinner to get him excited about trying the new food. Make sure the story ends with a cliff-hanger that will motivate him to try the food.



Certainly! Here are some short Pokémon battle stories to go with each dish:



Day 1

- Breakfast: Scrambled eggs with sautéed onions, tomatoes, and Ethiopian berbere spice mix

Story: Pikachu and his friends were exploring the wilds of Ethiopia when they were suddenly ambushed by a group of sneaky Pokémon thieves! As they raced through the dense jungle, they stumbled upon a hidden cave filled with treasure. But the only way to access the treasure was to defeat the powerful Berbere Dragon that guarded it. With their hearts pounding, the Pokémon bravely took on the dragon in a fierce battle. In the end, they emerged victorious, but not before the dragon left a fiery spice that imbued their breakfast eggs with a flavorful kick. Can you help Pikachu and his friends defeat the Berbere Dragon and enjoy this spicy breakfast?

Model: Default (GPT-3.5)

JU

I would like you to play a math game with my 9 year old to teach him about division with fractions and nutrition. Ask him questions one at a time involving Pokémon and these topics and make it into a game. When he wins, the Pokémon win.

Ask the first question.

Model: Default (GPT-3.5)

JU

I would like you to play a math game with my 9 year old to teach him about division with fractions and nutrition. Ask him questions one at a time involving Pokémon and these topics and make it into a game. When he wins, the Pokémon win.

Ask the first question.



Great! Let's play a fun math game involving Pokémon and nutrition.



Question 1: Pikachu and his friends are planning a meal that includes $\frac{1}{2}$ cup of cooked rice, but they need to divide it evenly among 3 Pokémon. How much rice will each Pokémon get?

Hint: To divide a fraction, we can flip the second fraction (the divisor) and multiply it by the first fraction (the dividend).

If you get stuck, feel free to ask for more hints or guidance!

OpenAI : ChatGPT 3.5

Model: Default (GPT-3.5)

JU

1/6

Model: Default (GPT-3.5)

JU 1/6



Good job! That's correct!



Each Pokémon will get $1/6$ cup of cooked rice.

We got this answer by dividing $1/2$ by 3, which gives us:

$$1/2 \div 3 = 1/2 \times 1/3 = 1/6$$

Keep up the great work! Here's the next question:

Question 2: Ash wants to make a smoothie that has $3/4$ cup of berries, but he only has $1/3$ cup of berries left in his fridge. How much more berries does he need to complete the recipe?

Model: Default (GPT-3.5)

JU

Let's create code for this in Python, but I want it to be a web application with FastAPI. It should have a single HTML page that asks the question and multiple choice for him to choose his answer. Generate two sample questions, but allow me to extend the game with more by editing a CSV file.



Sure, here's an example of how you can create a web application with FastAPI in Python for the math game with multiple-choice questions:



First, let's install the required dependencies using pip:

css

Copy code

```
pip install fastapi
pip install uvicorn[standard]
```

Next, create a new Python file called `main.py` and add the following code:

```
python Copy code  
  
from fastapi import FastAPI, Request  
from fastapi.responses import HTMLResponse  
import csv  
import random  
  
app = FastAPI()  
  
questions = []  
  
def load_questions(filename):  
    with open(filename, 'r') as csvfile:  
        reader = csv.reader(csvfile)  
        for row in reader:  
            questions.append({  
                'question': row[0],  
                'options': row[1:],
```

← → ↻ ⓘ localhost:8... 🌐 📄 ☆

Math Game

Pikachu and his friends are planning a meal that includes $\frac{1}{2}$ cup of cooked rice but they need to divide it evenly among 3 Pokémon. How much rice will each Pokémon get?

$\frac{1}{4}$
 $\frac{1}{3}$
 $\frac{1}{6}$

Submit

← → ↻ ⓘ localhost:8... 🌐 📄 ☆

Correct!
You win!

← → ↻ ⓘ localhost:8... 🌐 📄 ☆

Incorrect!
Try again!

Generative AI is changing our interface to computing...

ADMINISTRATIVE POLICY

Travel and Business Expense Policy

Approval Authority:	Vice Chancellor for Finance	Originally issued: November 2018
Responsible Administrator:	Controller	
Responsible Office:	Finance	Current version effective as of:
Policy Contact: Services	Senior Director, Purchasing and Payment	September 2022

POLICY STATEMENT/REASON FOR POLICY

This policy is to support the productivity and safety of those traveling on university business, to ensure compliance with external and internal requirements, and to confirm Vanderbilt resources are used properly.

Non-travel related business expenses may be reimbursed if an individual paid the expense from personal funds and no other acceptable methods of buying and paying are available (i.e. good(s) available via the catalog, goods requiring a purchase order as defined in the general purchasing policy, or goods purchased using the Vanderbilt One Card).

This document is intended to cover the most common travel-related situations; where unusual circumstances arise, the spirit of this policy – along with good judgment – should prevail.

General considerations:

- Travelers should neither gain nor lose personal funds as a result of business travel.
- Travelers will have necessary approvals and travel documents in order prior to travel.
- Individuals will use Vanderbilt contracted suppliers and booking and expense management tools.
- Individuals will follow the terms of sponsored research agreements for travel under such agreements.



Please read the provided document so that you can answer questions about it.



Travel_and_Business_Expense_Policy.pdf



Let's assume I am in a foreign country traveling in a taxi and it breaks down on the way to an important meeting. Can I get reimbursed if I pay someone to drive me on the back of their motorcycle to the meeting (assume they are a private citizen)?




Based on the information provided in the document, the key points relevant to your question are as follows:

1. The university requires travelers to select the most reasonable and economical form of transportation when traveling on university business. Travel by shuttle, ride share, ferry, car service, bus, taxi, or rail are allowable.
2. Non-conventional transportation options are not explicitly mentioned in the policy.
3. Vanderbilt does not have a separate policy on ride-sharing or non-conventional lodging. The university does not endorse any particular provider of these arrangements and is not responsible for the safety of travelers' persons or property in these or any other transportation or housing arrangements. Every traveler should carefully consider the ability of a particular vendor to provide complete, reliable, and safe services and accommodations when making travel choices.

Given these points, it seems plausible that in an emergency situation where no other reasonable and economical form of transportation is available, the cost of transportation by a private citizen's motorcycle might be considered an allowable expense. However, the university's policy does not explicitly state this, and reimbursement may be subject to review

JU

 rental_car_receipt.pdf

Please analyze the attached receipt and let me know if it complies.



Certainly! I'll begin by reading the content of the newly uploaded receipt for a rental car and then analyze it to determine if it complies with the Travel and Business Expense Policy that we previously reviewed.



Finished working

Show work

Based on the content of the rental car receipt and the Travel and Business Expense Policy, here's an analysis of compliance with the relevant sections of the policy:

1. **Rental Vehicles:**

- **Booking:** The policy requires the use of the online booking tool, travel agency, or rental car vendors with university discount codes. Without further information, it is unclear if ABC Rental Cars is a contracted supplier.
- **Rental Type:** A mid-sized car rental is allowable (2023 Ford Escape appears to comply), and all tolls, fuel, GPS, and parking fees are allowable.

2. **Collision Damage Waiver (CDW):** For domestic travel, the CDW should be declined, as rental vehicles are fully insured through Vanderbilt's insurance portfolio. The receipt shows a charge for CDW, which may not comply if this is domestic travel.

**Full-Time and Part-Time by Academic Load
Enrollment by School**

Term: 2022-2023 Year; 2022 Fall

Report Date: 9/21/22

Undergraduate

	Full-Time			Part-Time			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Arts and Science	1,868	2,050	3,918	16	10	26	1,884	2,060	3,944
Exchange/Overseas Program	20	31	51	0	0	0	20	31	51
Blair	118	113	231	2	0	2	120	113	233
Exchange/Overseas Program	1	1	2	0	0	0	1	1	2
D.U.S.	0	0	0	0	3	3	0	3	3
Engineering	824	600	1,424	33	8	41	857	608	1,465
Exchange/Overseas Program	1	3	4	0	0	0	1	3	4
Transient Students	2	2	4	0	0	0	2	2	4
Peabody	546	865	1,411	10	12	22	556	877	1,433
Exchange/Overseas Program	2	10	12	0	0	0	2	10	12
Total	3,382	3,675	7,057	61	33	94	3,443	3,708	7,151

Graduate, Professional & Special

	Full-Time			Part-Time			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Divinity	72	81	153	27	23	50	99	104	203
Engineering Professional Master	38	22	60	26	13	39	64	35	99
Graduate School	1,058	1,176	2,234	113	52	165	1,171	1,228	2,399
Law	238	315	553	8	7	15	246	322	568
Medicine	240	360	600	11	19	30	251	379	630
Nursing	66	474	540	26	279	305	92	753	845
OGSM	384	243	627	1	0	1	385	243	628
Peabody Professional Students	154	519	673	189	392	581	343	911	1,254
Special Professional	0	1	1	1	3	4	1	4	5
Total	2,250	3,191	5,441	402	788	1,190	2,652	3,979	6,631

	Full-Time			Part-Time			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Grand Total	5,632	6,866	12,498	463	821	1,284	6,095	7,687	13,782





JU




2022_Fall_Enrollment_Report.pdf

Please extract each page of this PDF as plain text in a separate file.



Sure, I'll start by extracting the text from each page of the uploaded PDF file and saving each page as a separate text file.  

Let's first take a look at the number of pages in the PDF to determine how many files will be created.

Finished working Show work 

...

You can download the text files for each page using the links below:

- [Page 1](#)
- [Page 2](#)
- [Page 3](#)
- [Page 4](#)
- [Page 5](#)
- [Page 6](#)
- [Page 7](#)

JU Turn this data into an Excel file for me to download



Finished working

Show work ▼



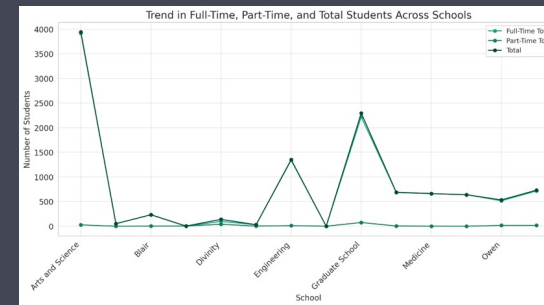
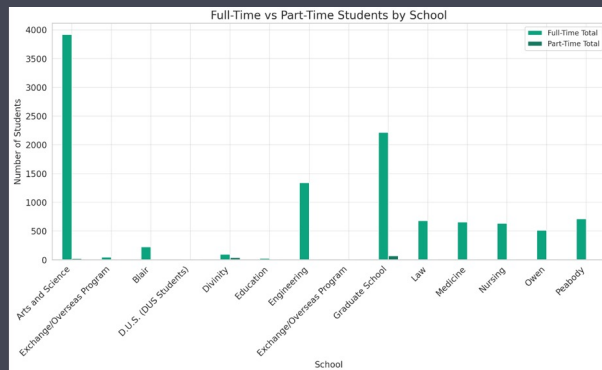
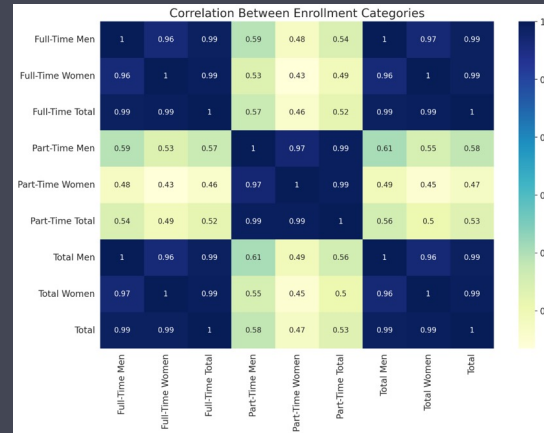
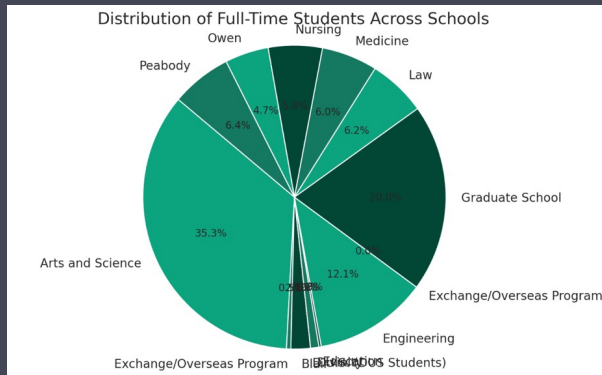
The enrollment data has been successfully converted into an Excel file. You can download it using the link below:

[Download the Excel file with enrollment data](#)

If you need any further assistance or modifications, please let me know!

JU

Display four interesting visualizations of this data.



And automating some of the mundane tasks to allow more time for thought...

JU



SLIDE_TEMPLATE.pptx

Save each visualization as an image. Then, insert each of these images as separate slides into the attached powerpoint. Make the visualizations 5in wide and 2.5in from the left size of the slide. Add a 3in wide text box with word-wrapped content that is 8in from the left side and contains a narrative of what is shown in the visualization with a white foreground color.



Sure! Let's start by saving each of the visualizations as separate image files. After that, I will insert them into the provided PowerPoint template, following the specified layout and dimensions.



First, I'll create and save the image files for each visualization.







...

You can download the [Download file](#) containing the visualizations using the link below:

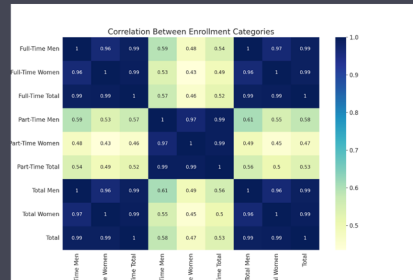
[Download the PowerPoint file with enrollment visualizations](#)

If you need any further adjustments or have additional requests, please let me know!

The PowerPoint it Created:

- 1 
- 2 
- 3 
- 4 
- 5 
- 6 

OpenAI: ChatGPT 3.5



The heatmap visualizes the correlation between different enrollment categories. It helps in understanding the relationships between full-time, part-time, men, women, and total students.

What you saw is far more transformative
than you realize...

Imagine you are getting ready to dig a hole with a shovel.

The shovel sees a large rock where you are going to dig.

The shovel jumps out of your hands, builds a pickaxe, and uses it to break up the rock.

The shovel jumps back into your hands.

You keep digging.




Sure! Let's start by saving each of the visualizations as separate image files. After that, I will insert them into the provided PowerPoint template, following the specified layout and dimensions.



First, I'll create and save the image files for each visualization.

Finished working

Show work 

First, I'll create and save the image files for each visualization.

Finished working

Hide work ^

python

Copy code

```
# Paths to save the image files
image_paths = {
    "bar_plot": "/mnt/data/bar_plot.png",
    "pie_chart": "/mnt/data/pie_chart.png",
    "heatmap": "/mnt/data/heatmap.png",
    "line_plot": "/mnt/data/line_plot.png"
}

# Function to save visualizations as image files
def save_visualizations(df):
    # Bar Plot
    plt.figure(figsize=(14, 6))
    df.plot(kind="bar", x="School", y=["Full-Time Total", "Part-Time Total"])
    plt.title("Full-Time vs Part-Time Students by School")
    plt.ylabel("Number of Students")
    plt.xticks(rotation=45, ha="right")
    plt.savefig(image_paths["bar_plot"])
    plt.close()
```

Two Key Revolutions in Computing

Revolution 1:

Generative AI has unique computational capabilities that far surpass what was available before.

Revolution 2:

Generative AI will be the new interface to computing that will supplant the GUI and traditional programming as our dominant interface.

(All imagery was AI-generated with Midjourney)

What Should We Learn?

It's Just Text Right?
You Don't Need to Do
Anything Special, Right?

Wrong



(All imagery was AI-generated with Midjourney)

Intuition About How ChatGPT Works

The Prompt they Trained With → What ChatGPT Was Taught to Predict

Mary had a little _____ → Lamb

Mary had a little lamb _____ → Its

Mary had a little lamb its _____ → fleece

ChatGPT is using patterns in our language to decide how to respond. The patterns in our prompt tap into patterns that ChatGPT learned.



(All imagery was AI-generated with Midjourney)



Mary had a little



lamb,

Its fleece was white as snow;

And everywhere that Mary went,

The lamb was sure to go.





Mary had a microscopic



I'm sorry, but your statement seems to be incomplete. Can you please provide more information or context so that I can better understand what you are trying to say or ask?



Prompt Patterns (Our Research)

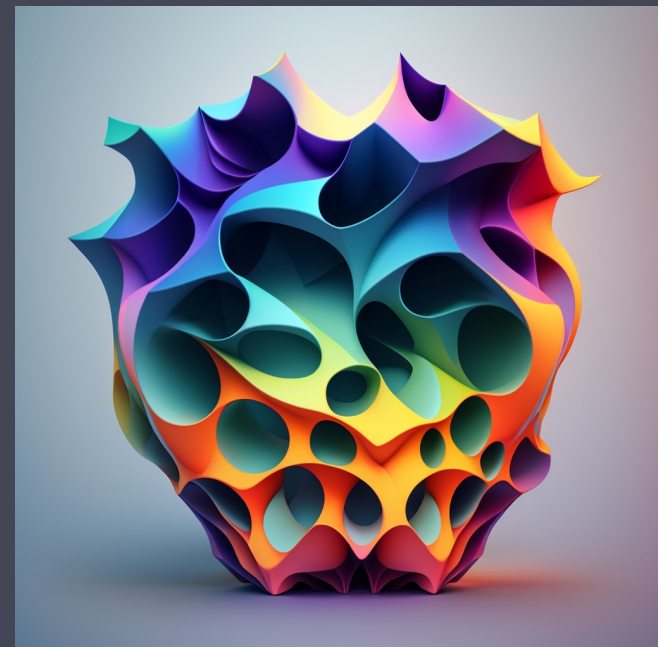
A “prompt pattern” is a pattern for organizing the statements in your prompt to solve a particular problem.

These patterns can “unlock” or “trigger” computations based on their structure

A Prompt Pattern Catalog to Enhance Prompt Engineering with ChatGPT

Jules White, Quchen Fu, Sam Hays, Michael Sandborn, Carlos Olea, Henry Gilbert, Ashraf Elnashar, Jesse Spencer-Smith, Douglas C. Schmidt

<https://arxiv.org/abs/2302.11382>



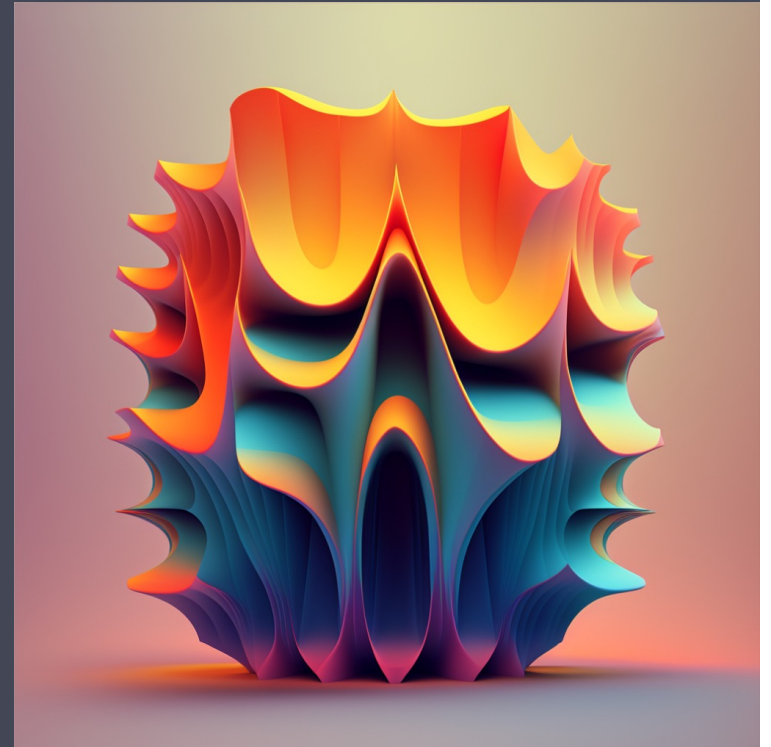
(All imagery was AI-generated with Midjourney)

Persona Pattern

The intent of this pattern is to help you when you know **who** or **what** you would like the output to look like it came from, but you don't know exactly what would be in that output.

Pattern:

"Act as *Persona*. Whenever you produce an output, produce the outputs that *Persona* would produce."



Persona Pattern Example

OpenAI : ChatGPT 3.5

JU

Act as a speech language pathologist. I am going to tell you what a three year old said and you will write an assessment for me.

The child said:

I meed way woy.



Subject: Assessment of a 3-year-old's speech sample



Date: 2023-03-21

Child's Speech Sample: "I meed way woy."

Assessment:

Based on the provided speech sample, it appears that the child may be experiencing some phonological and articulation errors, which are common in children around this age. The child's utterance appears to have errors in consonant production and possibly some difficulty with syllable structure.

1. Consonant errors: It seems that the child is having difficulty with the production of some consonant sounds, specifically the /n/ and /l/ sounds. The child said "meed" instead of "need" and "woy" instead of "toy" (assuming the intended words were "need" and "toy"). This indicates that the child may be experiencing difficulty with the production and differentiation of these consonant sounds.

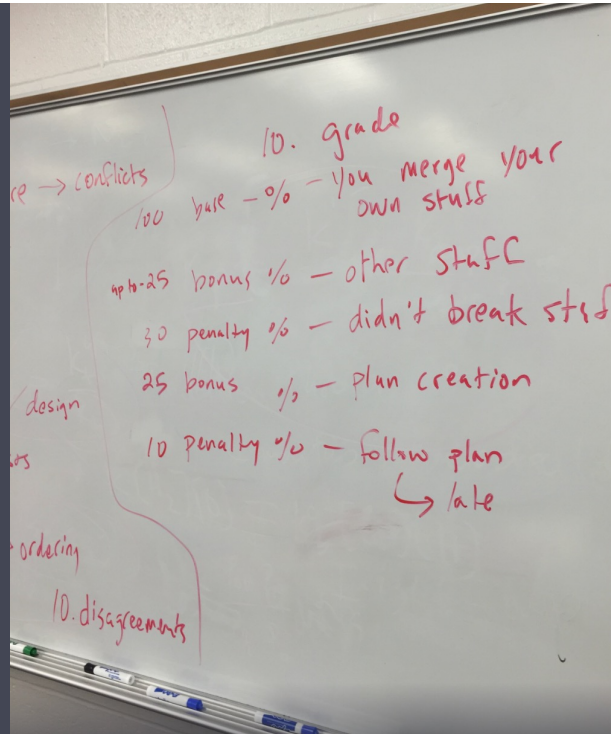
2. Syllable structure: The child's production of the word "way" may indicate some difficulty with the correct syllable structure. It is possible that the child intended to say "play" but produced "way" instead, which suggests a substitution of the initial consonant cluster /pl/ with a single consonant /w/. This could be an example of a simplification process called cluster reduction.

Recommendations:

Considering the child's age, it is important to remember that some speech sound errors are developmentally appropriate and may resolve on their own with time. However, it is crucial to monitor the child's speech development to ensure they are making progress.

Generative AI Can See

The world's most advanced computer vision is accessible on your phone.



Everyone agrees that we should implement this new grading policy that we brainstormed on the board. Please extract the grading policy and draft an email that I can send to the attendees afterwards describing the policy.



Certainly! Here's the extracted grading policy based on the image you've provided:



Grading Policy:

1. Grade:
 - If you merge your own stuff: -10%
 - If you didn't break stuff: +25% (bonus)
 - If you involve other stuff: +25% (bonus)
 - If you didn't follow the plan: -30% (penalty)
 - If you're late in following the plan: -10% (penalty)

(Note: Some parts of the image are a bit obscured, and I've done my best to extract the relevant information. Please cross-check with the original policy to ensure accuracy.)

Exploration & Discovery with Generative AI

OpenAI : ChatGPT 3.5



Give me step by step plans to make this. Create a complete list of materials with identifiers like 1a, 1b, etc. Then, output your step by step plan and reference the materials.



Materials List:

1. Rice:

- 1a: Sushi rice (1 cup)
- 1b: Rice vinegar (2 tablespoons)
- 1c: Sugar (1 tablespoon)
- 1d: Salt (1 teaspoon)

2. Fillings:

- 2a: Fresh salmon (4 ounces)
- 2b: Cream cheese (2 ounces)

3. Wrap:

- 3a: Nori seaweed sheets (1-2 sheets)

4. Extras:

- 4a: Bamboo sushi mat (optional, for rolling)

Step-by-Step Plan:

Step 1: Preparing the Sushi Rice

1. Rinse the Rice:

- Measure 1 cup of sushi rice (Material 1a) and rinse it under cold water until the water runs clear.

2. Cook the Rice:

- Cook the rice in a rice cooker or pot according to the package instructions. If using a pot, combine the rice with 1 1/4 cups of water, bring to a boil, then cover and reduce to a simmer for 18-20 minutes.

3. Season the Rice:

- While the rice is cooking, mix 2 tablespoons of rice vinegar (Material 1b), 1 tablespoon of sugar (Material 1c), and 1 teaspoon of salt (Material 1d) in a bowl until dissolved.
- Once the rice is cooked, transfer it to a large bowl and gently fold in the vinegar mixture with a spoon or spatula (Material 5e). Let the rice cool to room temperature.



Here is what I bought. What did I forget or get wrong?



Analysis of Purchased Items:

1. **Cabernet Sauvignon & Cheddar Cheese Spread** (instead of cream cheese)
2. **Soy Sauce** (correct)
3. **Yellow Rice** (instead of sushi rice)
4. **Roasted Seaweed Snacks** (instead of nori sheets)

Missing or Incorrect Items:

1. **Rice:**
 - **Sushi rice** (instead of yellow rice)
2. **Fillings:**
 - **Cream cheese** (instead of Cabernet Sauvignon & Cheddar Cheese Spread)
3. **Wrap:**
 - **Nori seaweed sheets** (instead of roasted seaweed snacks)

OpenAI : ChatGPT 3.5



Explain to me step by step how to use this.



Sure, here's a step-by-step guide on how to use this Keurig coffee maker:

1. Plug in the Machine:

- Ensure the Keurig machine is plugged into a power outlet.

2. Power On:

- Press the power button located on the top right of the machine to turn it on.

3. Fill the Water Reservoir:

- If the machine has a water reservoir, fill it with fresh water. Ensure the water level is above the minimum fill line.

4. Insert the K-Cup:

- Lift the handle on the top of the machine to open the K-Cup holder.
- Place your desired K-Cup pod into the holder.
- Close the handle by pushing it down firmly until it clicks.

5. Place a Cup:

OpenAI : ChatGPT 3.5





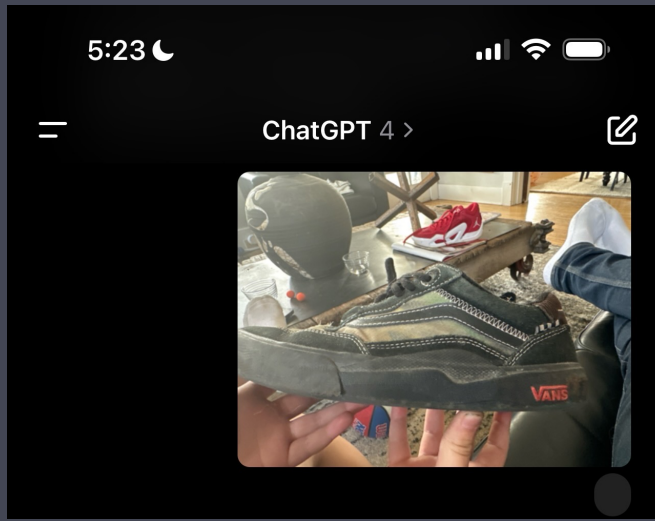
🌀 Based on the photo you provided, here's the inventory item:


Item: Air Jordan Basketball Shoes

Description: Red colorway with iconic Jumpman logo, high-top design.

Condition: Used with visible wear and slight

OpenAI : ChatGPT 3.5



 Here's the updated inventory with the new addition:

1. Item: Air Jordan Basketball Shoes

Description: Red colorway with iconic Jumpman logo, high-top design.

Condition: Used with visible wear and slight discoloration.

Approximate Price: \$50 to \$200+

2. Item: Vans Skate Shoes

Description: Black colorway with white stitching, classic Vans stripe on the side.

Condition: Heavily worn with visible damage and discoloration.

Approximate Price: Used Vans in heavily worn condition might be valued at \$10 to \$30.



Augmented intelligence, not “artificial”

Don't try to replace human intelligence and creativity with an “artificial” substitute, we want **augmented intelligence** that puts humans as an integral piece at the center.

Augmented Intelligence (AI+) is about augmenting and amplifying human creativity and problem solving.

You want to augment and amplify your unique human attributes, not attempt to replace them.

Augmented Intelligence serves as an “**exoskeleton for the mind**”





Prompt Engineering for ChatGPT

This course is part of multiple programs. [Learn more](#)



Instructor: [Dr. Jules White](#) [Top Instructor](#)

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Starts Oct 16

Financial aid available

327,030 already enrolled

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6 modules

Gain insight into a topic and learn the fundamentals.

4.8 ★

(3,579 reviews)

Beginner level

Recommended experience [i](#)

Thanks

Coursera Course on Prompt Engineering for ChatGPT

<https://www.coursera.org/learn/prompt-engineering>

Innovative Teaching with ChatGPT

<https://www.coursera.org/learn/chatgpt-innovative-teaching>

ChatGPT for Project Management: Execution, Tracking, Success

<https://www.coursera.org/learn/chatgpt-project-management-execution>

A Prompt Pattern Catalog to Enhance Prompt Engineering with ChatGPT

Jules White, Quchen Fu, Sam Hays, Michael Sandborn, Carlos Olea, Henry Gilbert, Ashraf Elnashar, Jesse Spencer-Smith, Douglas C. Schmidt

<https://arxiv.org/abs/2302.11382>



(All imagery was AI-generated with Midjourney)