

# L5 Process Inputs: Chaining Prompts

## Setup

Load the API key and relevant Python libraries.

In this course, we've provided some code that loads the OpenAI API key for you.

```
In [22]: import os
import openai
from dotenv import load_dotenv, find_dotenv
_ = load_dotenv(find_dotenv()) # read local .env file

openai.api_key = os.environ['OPENAI_API_KEY']
```

```
In [23]: def get_completion_from_messages(messages,
                                           model="gpt-3.5-turbo",
                                           temperature=0,
                                           max_tokens=500):
    response = openai.ChatCompletion.create(
        model=model,
        messages=messages,
        temperature=temperature,
        max_tokens=max_tokens,
    )
    return response.choices[0].message["content"]
```

# **Implement a complex task with multiple prompts**

**Extract relevant product and category names**

```
In [24]: delimiter = "####"
system_message = f"""
You will be provided with customer service queries. \
The customer service query will be delimited with \
{delimiter} characters.
Output a python list of objects, where each object has \
the following format:
    'category': <one of Computers and Laptops, \
Smartphones and Accessories, \
Televisions and Home Theater Systems, \
Gaming Consoles and Accessories, \
Audio Equipment, Cameras and Camcorders>,
OR
    'products': <a list of products that must \
be found in the allowed products below>

Where the categories and products must be found in \
the customer service query.
If a product is mentioned, it must be associated with \
the correct category in the allowed products list below.
If no products or categories are found, output an \
empty list.

Allowed products:

Computers and Laptops category:
TechPro Ultrabook
BlueWave Gaming Laptop
PowerLite Convertible
TechPro Desktop
BlueWave Chromebook

Smartphones and Accessories category:
SmartX ProPhone
MobiTech PowerCase
SmartX MiniPhone
MobiTech Wireless Charger
SmartX EarBuds

Televisions and Home Theater Systems category:
CineView 4K TV
SoundMax Home Theater
CineView 8K TV
SoundMax Soundbar
CineView OLED TV

Gaming Consoles and Accessories category:
GameSphere X
ProGamer Controller
GameSphere Y
ProGamer Racing Wheel
GameSphere VR Headset

Audio Equipment category:
AudioPhonic Noise-Canceling Headphones
WaveSound Bluetooth Speaker
AudioPhonic True Wireless Earbuds
```

```
WaveSound Soundbar
AudioPhonic Turntable
```

```
Cameras and Camcorders category:
```

```
FotoSnap DSLR Camera
ActionCam 4K
FotoSnap Mirrorless Camera
ZoomMaster Camcorder
FotoSnap Instant Camera
```

```
Only output the list of objects, with nothing else.
"""
```

```
user_message_1 = f"""
tell me about the smartx pro phone and \
the fotosnap camera, the dslr one. \
Also tell me about your tvs """
messages = [
    {'role': 'system',
     'content': system_message},
    {'role': 'user',
     'content': f"{delimiter}{user_message_1}{delimiter}"},
]
category_and_product_response_1 = get_completion_from_messages(messages)
print(category_and_product_response_1)
```

```
[
    {'category': 'Smartphones and Accessories', 'products': ['SmartX ProPhone']},
    {'category': 'Cameras and Camcorders', 'products': ['FotoSnap DSLR Camera']},
    {'category': 'Televisions and Home Theater Systems'}
]
```

```
In [25]: user_message_2 = f"""
my router isn't working"""
messages = [
    {'role': 'system',
     'content': system_message},
    {'role': 'user',
     'content': f"{delimiter}{user_message_2}{delimiter}"},
]
response = get_completion_from_messages(messages)
print(response)
```

```
[]
```

## **Retrieve detailed product information for extracted products and categories**

In [26]: *# product information*

```
products = {
    "TechPro Ultrabook": {
        "name": "TechPro Ultrabook",
        "category": "Computers and Laptops",
        "brand": "TechPro",
        "model_number": "TP-UB100",
        "warranty": "1 year",
        "rating": 4.5,
        "features": ["13.3-inch display", "8GB RAM", "256GB SSD", "Intel Co
        "description": "A sleek and lightweight ultrabook for everyday use.
        "price": 799.99
    },
    "BlueWave Gaming Laptop": {
        "name": "BlueWave Gaming Laptop",
        "category": "Computers and Laptops",
        "brand": "BlueWave",
        "model_number": "BW-GL200",
        "warranty": "2 years",
        "rating": 4.7,
        "features": ["15.6-inch display", "16GB RAM", "512GB SSD", "NVIDIA
        "description": "A high-performance gaming laptop for an immersive e
        "price": 1199.99
    },
    "PowerLite Convertible": {
        "name": "PowerLite Convertible",
        "category": "Computers and Laptops",
        "brand": "PowerLite",
        "model_number": "PL-CV300",
        "warranty": "1 year",
        "rating": 4.3,
        "features": ["14-inch touchscreen", "8GB RAM", "256GB SSD", "360-de
        "description": "A versatile convertible laptop with a responsive to
        "price": 699.99
    },
    "TechPro Desktop": {
        "name": "TechPro Desktop",
        "category": "Computers and Laptops",
        "brand": "TechPro",
        "model_number": "TP-DT500",
        "warranty": "1 year",
        "rating": 4.4,
        "features": ["Intel Core i7 processor", "16GB RAM", "1TB HDD", "NVI
        "description": "A powerful desktop computer for work and play.",
        "price": 999.99
    },
    "BlueWave Chromebook": {
        "name": "BlueWave Chromebook",
        "category": "Computers and Laptops",
        "brand": "BlueWave",
        "model_number": "BW-CB100",
        "warranty": "1 year",
        "rating": 4.1,
        "features": ["11.6-inch display", "4GB RAM", "32GB eMMC", "Chrome O
        "description": "A compact and affordable Chromebook for everyday ta
        "price": 249.99
    },
}
```

```
"SmartX ProPhone": {
  "name": "SmartX ProPhone",
  "category": "Smartphones and Accessories",
  "brand": "SmartX",
  "model_number": "SX-PP10",
  "warranty": "1 year",
  "rating": 4.6,
  "features": ["6.1-inch display", "128GB storage", "12MP dual camera"],
  "description": "A powerful smartphone with advanced camera features",
  "price": 899.99
},
"MobiTech PowerCase": {
  "name": "MobiTech PowerCase",
  "category": "Smartphones and Accessories",
  "brand": "MobiTech",
  "model_number": "MT-PC20",
  "warranty": "1 year",
  "rating": 4.3,
  "features": ["5000mAh battery", "Wireless charging", "Compatible with Qi"],
  "description": "A protective case with built-in battery for extended use",
  "price": 59.99
},
"SmartX MiniPhone": {
  "name": "SmartX MiniPhone",
  "category": "Smartphones and Accessories",
  "brand": "SmartX",
  "model_number": "SX-MP5",
  "warranty": "1 year",
  "rating": 4.2,
  "features": ["4.7-inch display", "64GB storage", "8MP camera", "4G LTE"],
  "description": "A compact and affordable smartphone for basic tasks",
  "price": 399.99
},
"MobiTech Wireless Charger": {
  "name": "MobiTech Wireless Charger",
  "category": "Smartphones and Accessories",
  "brand": "MobiTech",
  "model_number": "MT-WC10",
  "warranty": "1 year",
  "rating": 4.5,
  "features": ["10W fast charging", "Qi-compatible", "LED indicator"],
  "description": "A convenient wireless charger for a clutter-free workspace",
  "price": 29.99
},
"SmartX EarBuds": {
  "name": "SmartX EarBuds",
  "category": "Smartphones and Accessories",
  "brand": "SmartX",
  "model_number": "SX-EB20",
  "warranty": "1 year",
  "rating": 4.4,
  "features": ["True wireless", "Bluetooth 5.0", "Touch controls", "24h battery life"],
  "description": "Experience true wireless freedom with these comfortable earbuds",
  "price": 99.99
},
"CineView 4K TV": {
```

```
"name": "CineView 4K TV",
"category": "Televisions and Home Theater Systems",
"brand": "CineView",
"model_number": "CV-4K55",
"warranty": "2 years",
"rating": 4.8,
"features": ["55-inch display", "4K resolution", "HDR", "Smart TV"]
"description": "A stunning 4K TV with vibrant colors and smart feat
"price": 599.99
},
"SoundMax Home Theater": {
  "name": "SoundMax Home Theater",
  "category": "Televisions and Home Theater Systems",
  "brand": "SoundMax",
  "model_number": "SM-HT100",
  "warranty": "1 year",
  "rating": 4.4,
  "features": ["5.1 channel", "1000W output", "Wireless subwoofer", "
  "description": "A powerful home theater system for an immersive aud
  "price": 399.99
},
"CineView 8K TV": {
  "name": "CineView 8K TV",
  "category": "Televisions and Home Theater Systems",
  "brand": "CineView",
  "model_number": "CV-8K65",
  "warranty": "2 years",
  "rating": 4.9,
  "features": ["65-inch display", "8K resolution", "HDR", "Smart TV"]
  "description": "Experience the future of television with this stunn
  "price": 2999.99
},
"SoundMax Soundbar": {
  "name": "SoundMax Soundbar",
  "category": "Televisions and Home Theater Systems",
  "brand": "SoundMax",
  "model_number": "SM-SB50",
  "warranty": "1 year",
  "rating": 4.3,
  "features": ["2.1 channel", "300W output", "Wireless subwoofer", "B
  "description": "Upgrade your TV's audio with this sleek and powerfu
  "price": 199.99
},
"CineView OLED TV": {
  "name": "CineView OLED TV",
  "category": "Televisions and Home Theater Systems",
  "brand": "CineView",
  "model_number": "CV-OLED55",
  "warranty": "2 years",
  "rating": 4.7,
  "features": ["55-inch display", "4K resolution", "HDR", "Smart TV"]
  "description": "Experience true blacks and vibrant colors with this
  "price": 1499.99
},
"GameSphere X": {
  "name": "GameSphere X",
```



```
"category": "Gaming Consoles and Accessories",
"brand": "GameSphere",
"model_number": "GS-X",
"warranty": "1 year",
"rating": 4.9,
"features": ["4K gaming", "1TB storage", "Backward compatibility",
"description": "A next-generation gaming console for the ultimate g
"price": 499.99
},
"ProGamer Controller": {
  "name": "ProGamer Controller",
  "category": "Gaming Consoles and Accessories",
  "brand": "ProGamer",
  "model_number": "PG-C100",
  "warranty": "1 year",
  "rating": 4.2,
  "features": ["Ergonomic design", "Customizable buttons", "Wireless"
  "description": "A high-quality gaming controller for precision and
  "price": 59.99
},
"GameSphere Y": {
  "name": "GameSphere Y",
  "category": "Gaming Consoles and Accessories",
  "brand": "GameSphere",
  "model_number": "GS-Y",
  "warranty": "1 year",
  "rating": 4.8,
  "features": ["4K gaming", "500GB storage", "Backward compatibility"
  "description": "A compact gaming console with powerful performance.
  "price": 399.99
},
"ProGamer Racing Wheel": {
  "name": "ProGamer Racing Wheel",
  "category": "Gaming Consoles and Accessories",
  "brand": "ProGamer",
  "model_number": "PG-RW200",
  "warranty": "1 year",
  "rating": 4.5,
  "features": ["Force feedback", "Adjustable pedals", "Paddle shifter
  "description": "Enhance your racing games with this realistic racin
  "price": 249.99
},
"GameSphere VR Headset": {
  "name": "GameSphere VR Headset",
  "category": "Gaming Consoles and Accessories",
  "brand": "GameSphere",
  "model_number": "GS-VR",
  "warranty": "1 year",
  "rating": 4.6,
  "features": ["Immersive VR experience", "Built-in headphones", "Adj
  "description": "Step into the world of virtual reality with this co
  "price": 299.99
},
"AudioPhonic Noise-Canceling Headphones": {
  "name": "AudioPhonic Noise-Canceling Headphones",
  "category": "Audio Equipment",
```

```
    "brand": "AudioPhonic",
    "model_number": "AP-NC100",
    "warranty": "1 year",
    "rating": 4.6,
    "features": ["Active noise-canceling", "Bluetooth", "20-hour batter
    "description": "Experience immersive sound with these noise-canceli
    "price": 199.99
},
"WaveSound Bluetooth Speaker": {
    "name": "WaveSound Bluetooth Speaker",
    "category": "Audio Equipment",
    "brand": "WaveSound",
    "model_number": "WS-BS50",
    "warranty": "1 year",
    "rating": 4.5,
    "features": ["Portable", "10-hour battery life", "Water-resistant",
    "description": "A compact and versatile Bluetooth speaker for music
    "price": 49.99
},
"AudioPhonic True Wireless Earbuds": {
    "name": "AudioPhonic True Wireless Earbuds",
    "category": "Audio Equipment",
    "brand": "AudioPhonic",
    "model_number": "AP-TW20",
    "warranty": "1 year",
    "rating": 4.4,
    "features": ["True wireless", "Bluetooth 5.0", "Touch controls", "1
    "description": "Enjoy music without wires with these comfortable tr
    "price": 79.99
},
"WaveSound Soundbar": {
    "name": "WaveSound Soundbar",
    "category": "Audio Equipment",
    "brand": "WaveSound",
    "model_number": "WS-SB40",
    "warranty": "1 year",
    "rating": 4.3,
    "features": ["2.0 channel", "80W output", "Bluetooth", "Wall-mounta
    "description": "Upgrade your TV's audio with this slim and powerful
    "price": 99.99
},
"AudioPhonic Turntable": {
    "name": "AudioPhonic Turntable",
    "category": "Audio Equipment",
    "brand": "AudioPhonic",
    "model_number": "AP-TT10",
    "warranty": "1 year",
    "rating": 4.2,
    "features": ["3-speed", "Built-in speakers", "Bluetooth", "USB reco
    "description": "Rediscover your vinyl collection with this modern t
    "price": 149.99
},
"FotoSnap DSLR Camera": {
    "name": "FotoSnap DSLR Camera",
    "category": "Cameras and Camcorders",
    "brand": "FotoSnap",
```

```
    "model_number": "FS-DSLR200",
    "warranty": "1 year",
    "rating": 4.7,
    "features": ["24.2MP sensor", "1080p video", "3-inch LCD", "Interch
    "description": "Capture stunning photos and videos with this versat
    "price": 599.99
  },
  "ActionCam 4K": {
    "name": "ActionCam 4K",
    "category": "Cameras and Camcorders",
    "brand": "ActionCam",
    "model_number": "AC-4K",
    "warranty": "1 year",
    "rating": 4.4,
    "features": ["4K video", "Waterproof", "Image stabilization", "Wi-F
    "description": "Record your adventures with this rugged and compact
    "price": 299.99
  },
  "FotoSnap Mirrorless Camera": {
    "name": "FotoSnap Mirrorless Camera",
    "category": "Cameras and Camcorders",
    "brand": "FotoSnap",
    "model_number": "FS-ML100",
    "warranty": "1 year",
    "rating": 4.6,
    "features": ["20.1MP sensor", "4K video", "3-inch touchscreen", "In
    "description": "A compact and lightweight mirrorless camera with ad
    "price": 799.99
  },
  "ZoomMaster Camcorder": {
    "name": "ZoomMaster Camcorder",
    "category": "Cameras and Camcorders",
    "brand": "ZoomMaster",
    "model_number": "ZM-CM50",
    "warranty": "1 year",
    "rating": 4.3,
    "features": ["1080p video", "30x optical zoom", "3-inch LCD", "Imag
    "description": "Capture life's moments with this easy-to-use camcor
    "price": 249.99
  },
  "FotoSnap Instant Camera": {
    "name": "FotoSnap Instant Camera",
    "category": "Cameras and Camcorders",
    "brand": "FotoSnap",
    "model_number": "FS-IC10",
    "warranty": "1 year",
    "rating": 4.1,
    "features": ["Instant prints", "Built-in flash", "Selfie mirror", "
    "description": "Create instant memories with this fun and portable
    "price": 69.99
  }
}
```

```
In [27]: def get_product_by_name(name):  
         return products.get(name, None)  
  
         def get_products_by_category(category):  
             return [product for product in products.values() if product["category"]
```

```
In [28]: print(get_product_by_name("TechPro Ultrabook"))
```

```
{'name': 'TechPro Ultrabook', 'category': 'Computers and Laptops', 'brand':  
'TechPro', 'model_number': 'TP-UB100', 'warranty': '1 year', 'rating': 4.5,  
'features': ['13.3-inch display', '8GB RAM', '256GB SSD', 'Intel Core i5 proc  
essor'], 'description': 'A sleek and lightweight ultrabook for everyday us  
e.', 'price': 799.99}
```

```
In [29]: print(get_products_by_category("Computers and Laptops"))
```

```
[{'name': 'TechPro Ultrabook', 'category': 'Computers and Laptops', 'brand':  
'TechPro', 'model_number': 'TP-UB100', 'warranty': '1 year', 'rating': 4.5,  
'features': ['13.3-inch display', '8GB RAM', '256GB SSD', 'Intel Core i5 proc  
essor'], 'description': 'A sleek and lightweight ultrabook for everyday us  
e.', 'price': 799.99}, {'name': 'BlueWave Gaming Laptop', 'category': 'Comput  
ers and Laptops', 'brand': 'BlueWave', 'model_number': 'BW-GL200', 'warrant  
y': '2 years', 'rating': 4.7, 'features': ['15.6-inch display', '16GB RAM',  
'512GB SSD', 'NVIDIA GeForce RTX 3060'], 'description': 'A high-performance g  
aming laptop for an immersive experience.', 'price': 1199.99}, {'name': 'Powe  
rLite Convertible', 'category': 'Computers and Laptops', 'brand': 'PowerLit  
e', 'model_number': 'PL-CV300', 'warranty': '1 year', 'rating': 4.3, 'feature  
s': ['14-inch touchscreen', '8GB RAM', '256GB SSD', '360-degree hinge'], 'des  
cription': 'A versatile convertible laptop with a responsive touchscreen.',  
'price': 699.99}, {'name': 'TechPro Desktop', 'category': 'Computers and Lapt  
ops', 'brand': 'TechPro', 'model_number': 'TP-DT500', 'warranty': '1 year',  
'rating': 4.4, 'features': ['Intel Core i7 processor', '16GB RAM', '1TB HDD',  
'NVIDIA GeForce GTX 1660'], 'description': 'A powerful desktop computer for w  
ork and play.', 'price': 999.99}, {'name': 'BlueWave Chromebook', 'category':  
'Computers and Laptops', 'brand': 'BlueWave', 'model_number': 'BW-CB100', 'wa  
rranty': '1 year', 'rating': 4.1, 'features': ['11.6-inch display', '4GB RA  
M', '32GB eMMC', 'Chrome OS'], 'description': 'A compact and affordable Chrom  
ebook for everyday tasks.', 'price': 249.99}]
```

```
In [30]: print(user_message_1)
```

tell me about the smartx pro phone and the fotosnap camera, the dslr one.  
Also tell me about your tvs

```
In [31]: print(category_and_product_response_1)
```

```
[
  {'category': 'Smartphones and Accessories', 'products': ['SmartX ProPhone']},
  {'category': 'Cameras and Camcorders', 'products': ['FotoSnap DSLR Camera']},
  {'category': 'Televisions and Home Theater Systems'}
]
```

## Read Python string into Python list of dictionaries

```
In [32]: import json

def read_string_to_list(input_string):
    if input_string is None:
        return None

    try:
        input_string = input_string.replace("'", "\"") # Replace single quotes with double quotes
        data = json.loads(input_string)
        return data
    except json.JSONDecodeError:
        print("Error: Invalid JSON string")
        return None
```

```
In [33]: category_and_product_list = read_string_to_list(category_and_product_response_1)
print(category_and_product_list)
```

```
[{'category': 'Smartphones and Accessories', 'products': ['SmartX ProPhone']}, {'category': 'Cameras and Camcorders', 'products': ['FotoSnap DSLR Camera']}, {'category': 'Televisions and Home Theater Systems'}]
```

## Retrieve detailed product information for the relevant products and categories

```

In [34]: def generate_output_string(data_list):
    output_string = ""

    if data_list is None:
        return output_string

    for data in data_list:
        try:
            if "products" in data:
                products_list = data["products"]
                for product_name in products_list:
                    product = get_product_by_name(product_name)
                    if product:
                        output_string += json.dumps(product, indent=4) + "\r\n"
                    else:
                        print(f"Error: Product '{product_name}' not found")
            elif "category" in data:
                category_name = data["category"]
                category_products = get_products_by_category(category_name)
                for product in category_products:
                    output_string += json.dumps(product, indent=4) + "\n"
            else:
                print("Error: Invalid object format")
        except Exception as e:
            print(f"Error: {e}")

    return output_string

```

```

In [35]: product_information_for_user_message_1 = generate_output_string(category_and_products_list)
print(product_information_for_user_message_1)

```

```

{
  "name": "SmartX ProPhone",
  "category": "Smartphones and Accessories",
  "brand": "SmartX",
  "model_number": "SX-PP10",
  "warranty": "1 year",
  "rating": 4.6,
  "features": [
    "6.1-inch display",
    "128GB storage",
    "12MP dual camera",
    "5G"
  ],
  "description": "A powerful smartphone with advanced camera features.",
  "price": 899.99
}
{
  "name": "FotoSnap DSLR Camera",
  "category": "Cameras and Camcorders",
  "brand": "FotoSnap",
  "model_number": "FS-DSLR1",
  "warranty": "2 years",
  "rating": 4.8,
  "features": [
    "24MP sensor",
    "4K video recording",
    "Weather-sealed body",
    "Interchangeable lenses"
  ],
  "description": "A professional-grade DSLR camera with exceptional image quality and versatility.",
  "price": 1299.99
}

```

## Generate answer to user query based on detailed product information

```
In [36]: system_message = f"""
You are a customer service assistant for a \
large electronic store. \
Respond in a friendly and helpful tone, \
with very concise answers. \
Make sure to ask the user relevant follow up questions.
"""

user_message_1 = f"""
tell me about the smartx pro phone and \
the fotosnap camera, the dslr one. \
Also tell me about your tvs"""

messages = [
    {'role': 'system',
     'content': system_message},
    {'role': 'user',
     'content': user_message_1},
    {'role': 'assistant',
     'content': f"""Relevant product information:\n\
{product_information_for_user_message_1}"""},
]

final_response = get_completion_from_messages(messages)
print(final_response)
```

The SmartX ProPhone has a 6.1-inch display, 128GB storage, 12MP dual camera, and 5G. The FotoSnap DSLR Camera has a 24.2MP sensor, 1080p video, 3-inch LCD, and interchangeable lenses. We have a variety of TVs, including the CineView 4K TV with a 55-inch display, 4K resolution, HDR, and smart TV features. We also have the SoundMax Home Theater system with 5.1 channel, 1000W output, wireless subwoofer, and Bluetooth. Do you have any specific questions about these products or any other products we offer?

In [ ]: