# Product-Expert Slackbot
## AI and LangChain Exercise

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# Goals

**Evaluation Exercise**

- Index Home Depot's sitemap

- Create chatbot that functions as an expert on the products listed

- Use Slack API ("slackbot") for UI

- Research langchain, other resources for help

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# Approach

My Plan

1. Research relevant tools
2. Scrape enough data to test LLM
3. Create LLM
4. Complete web scraping
5. Integrate with Slack
6. Make improvements and create README

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# Architecture

**Langchain API**

**Local Server**

**Web Scraping**

**Serveo**

**Slack**

**Users**
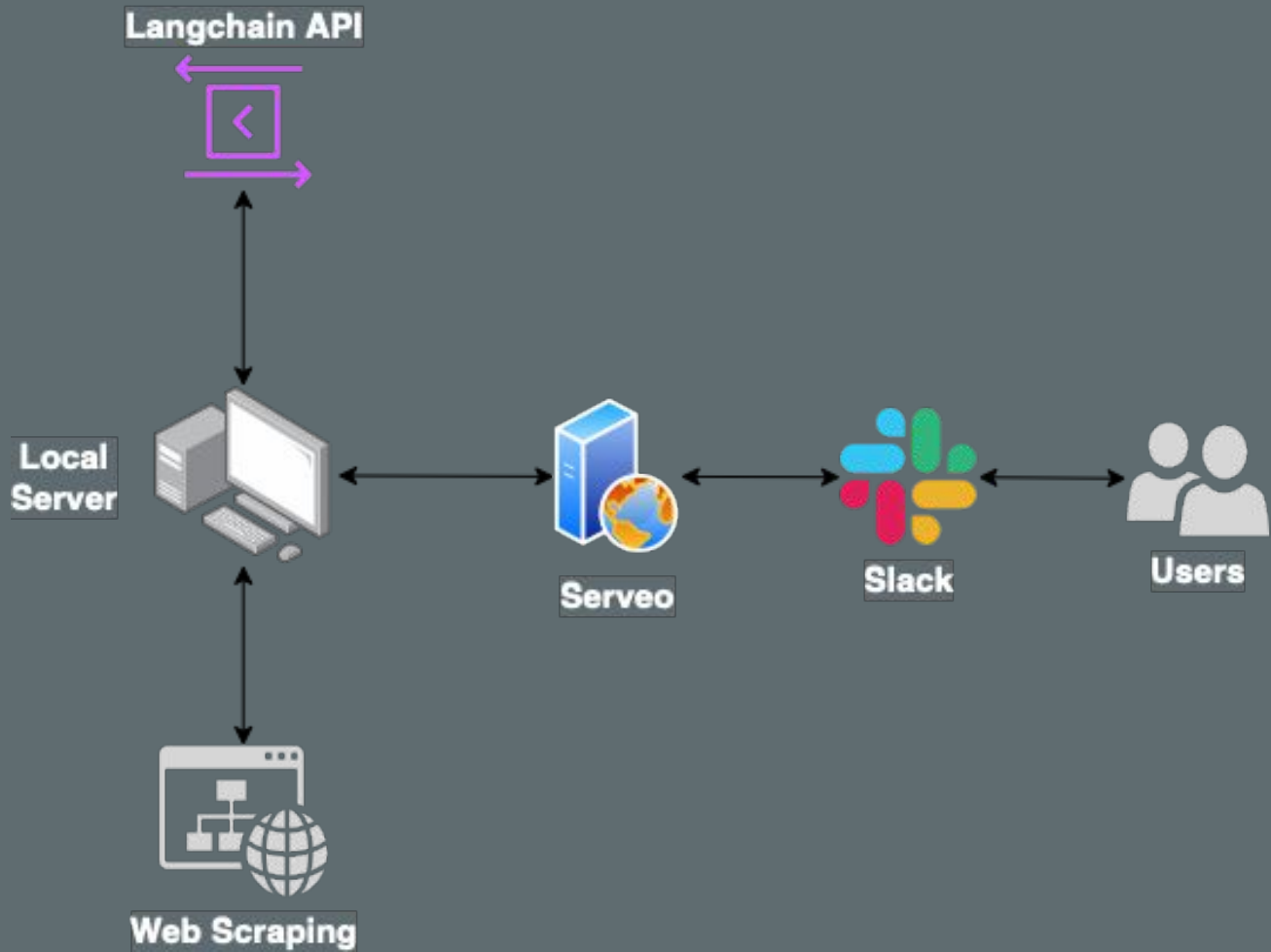
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# Web Scraping

# Home Depot Sitemap

- XML document tree

- Manually perused

- Multiple levels of product categorization

www.homedepot.com/sitemap/main.xml

This XML file does not appear to have any style information associated with it, The doc

<sitemapindex xmlns="http://www.sitemaps.org/schemas/sitemap/0.9">
<sitemap>
    <loc>https://www.homedepot.com/sitemap/HomeServices.xml</loc>
</sitemap>
<sitemap>
    <loc>https://www.homedepot.com/sitemap/P/PIPs.xml</loc>
</sitemap>
<sitemap>
    <loc>https://www.homedepot.com/sitemap/B/PLPs.xml</loc>
</sitemap>
<sitemap>
  <loc>
      https://www.homedepot.com/sitemap/Hreflang/hreflang.xml
  </loc>
</sitemap>
<sitemap>
    <loc>https://www.homedepot.com/sitemap/PPS.xml</loc>
</sitemap>
<sitemap>
    <loc>https://www.homedepot.com/sitemap/Cat.xml</loc>
</sitemap>
<sitemap>
  <loc>
      https://www.homedepot.com/sitemap/B/Brands/Brands-0.xml
  </loc>
</sitemap>
<sitemap>
    <loc>https://www.homedepot.com/sitemap/C/content.xml</loc>
</sitemap>
<sitemap>
    <loc>https://www.homedepot.com/sitemap/C/collection.xml</loc>
</sitemap>
</sitemapindex>

# XML Hierarchy

**All Products**

…`/P/PIPs.xml`

**Subcategory**

…`/P/PIPs/`
`X.xml`

**Subcategory**

…`/P/PIPs/X/`
`XX-XX.xml`

**Product**

…`/p/product`

Iterate through XML links and use Beautiful Soup API

# Scraping Product Information



- Scrape the product's name, price, basic info, rating, and review count

- Save into CSV file

www.homedepot.com/p/Jackson-6-cu-ft

KICKSTART SUMMER SAVINGS While Supplies Last. Shop Now. ›

Store Finder   Truck & Tool Rental   For the Pro   Gift Cards   Credit Services   Track Order   Help

You're shopping
Hawthorne
● OPEN until 10 pm

Delivering to
90250

What can we help you find today?

My Account
Lists
Cart | 0 items

All Departments   Home Decor, Furniture & Kitchenware   DIY Projects & Ideas   Project Calculators   Installation & Services   Specials & Offers   Local Ad & Catalog

Home / Outdoors / Garden Center / Garden Tools / Wheelbarrows

Internet #206205928   Model #M6KBUT12   Store SKU #213139
Store SO SKU #1005201388

Best Seller

♡ 947

Jackson
**6 cu. ft. Steel Wheelbarrow**
★★★★½ (448)    ...tions & Answers (44)

**Product name**

**Rating**

**Review count**

$**149**00

Pay $124.00 after $25 OFF your total qualifying purchase upon opening a new card. ⓘ
Apply for a Home Depot Consumer Card

**Price**

- Heavy-duty steel tray with 6 cu ft capacity
- Patented leg stabilizers make wheelbarrow 40% more ti... resistant
- Contractor grade steel undercarriage and durable hardwood handles
- View More Details

**Basic info**

Pickup at Hawthorne          Delivering to 90250

**Pickup**
Today
30 in stock
FREE

**Delivery**
Today
41 available

Get it as soon as today. Schedule your delivery in checkout.

Hover Image to Zoom

- [ 1 ] +    🛒 Add to Cart

— or —

Buy now with PayPal

**ProductList**

**Product Info**

The name of the product is Oriented Strand Board (Common: 19/32 in. x 4 ft. x 8 ft.; Actual: 0.578 in. x 47.75 in. x 95.75 in.). The price is not available. The rating is 4.3 out of 5. The number of reviews is 248. The product information is as follows: Meets the APA-ratings for safety and quality. Smooth surface that makes it easy to paint. Ideal to use as sheathing for your roof

The name of the product is 1-1/8 in. x 4 ft. x 8 ft. T&G Sheathing Plywood. The price is not available. The rating is 4.6 out of 5. The number of reviews is 54. The product information is as follows: Plywood panels for home projects. Sanded and easy to work with. Strong, stable panels

The name of the product is RigidShake 3/8 in. x 12 in. x 48 in. Prefinished Woodgrain Composite Straight Edge Shake Siding in Emerald (4-Pack). The price is not available. The rating is not available. The number of reviews is not available. The product information is as follows: not available

The name of the product is 1 in. x 6 in. x 6 ft. S4S Hickory Board. The price is $32. The rating is 3.6 out of 5. The number of reviews is 83. The product information is as follows: Surfaced four sides (S4S) hardwood board. Premium clear hickory wood. Great for interior home projects.

The name of the product is 2 in. x 6 in. x 16 ft. #2 and Better Prime Doug Fir Lumber. The price is not available. The rating is 3.8 out of 5. The number of reviews is 195. The product information is as follows: Meets highest grading standards for strength and appearance. Easy to cut, fasten and paint, perfect for many building projects. Ideal for framing, houses, sheds, and other structures

The name of the product is 1 in. x 3 in. x Random Length S4S White Oak Board. The price is not available. The rating is 4.0 out of 5. The number of reviews is 1. The product information is as follows: Perfect for accent walls and other DIY projects. Can be primed then painted/sealed then stained. Meets the highest grading standards for strength and appearance

Product details concatenated to improve chatbot functionality

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# Chatbot

# Chatbot Design

- Use langchain to create LLM

- Read CSV data

- Load data into model

- Integrate memory

- Remembers last 4 messages

```python
llm = ChatOpenAI((model_name = 'gpt-3.5-turbo'), (openai_api_key = OPENAI_KEY))

df = pd.read_csv('ProductList.csv')
loader = DataFrameLoader(df, (page_content_column = 'Product Info'))
documents = loader.load()

text_splitter = CharacterTextSplitter(
  (chunk_size = 1000),
  (chunk_overlap = 0),
  (separator = 'Document(')
)
texts = text_splitter.split_documents(documents)

embeddings = OpenAIEmbeddings((openai_api_key = OPENAI_KEY))
docsearch = Chroma.from_documents(texts, embeddings)

memory = ConversationBufferWindowMemory((k = 4), (return_messages = True))

qa = RetrievalQA.from_chain_type(
  llm,
  (chain_type = 'stuff'),
  (memory = memory),
  (retriever = docsearch.as_retriever())
)
```

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# Slack Integration

# Slack Events and Requests

- Slack app "events" enable interaction

- Everything sent to request URL, computations performed locally

- Permissions necessary

## Enable Events



Your app can subscribe to be notified of events in Slack (for example, when a user adds a reaction or creates a file) at a URL you choose. Learn more.

**Request URL** Verified ✓

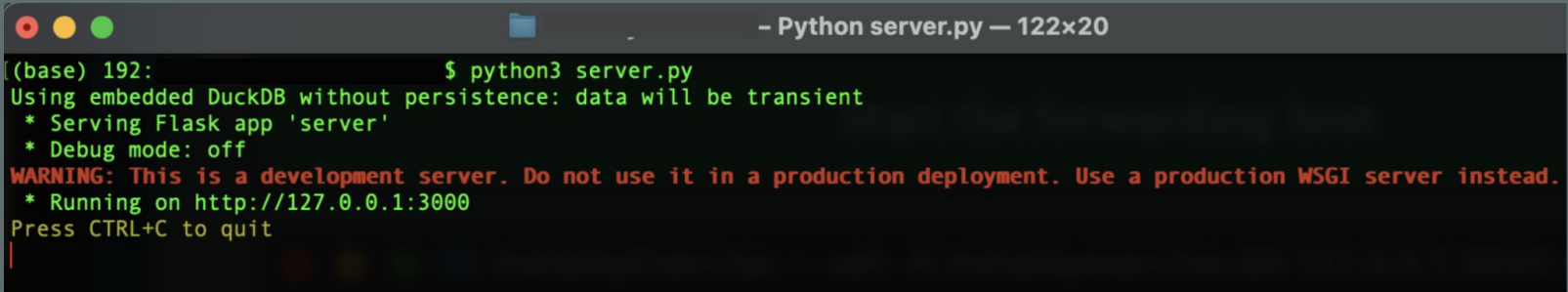https:                    .serveo.net/slack/events          [Change]

We'll send HTTP POST requests to this URL when events occur. As soon as you enter a URL, we'll send a request with a `challenge` parameter, and your endpoint must respond with the challenge value. Learn more.

## Subscribe to bot events

Apps can subscribe to receive events the bot user has access to (like new messages in a channel). If you add an event here, we'll add the necessary OAuth scope for you.
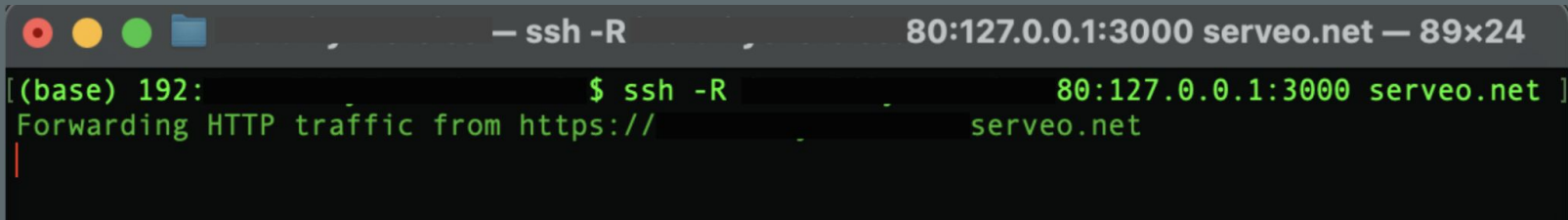
| Event Name | Description | Required Scope | |
|---|---|---|---|
| app_mention | Subscribe to only the message events that mention your app or bot | app_mentions:read | 🗑 |
| message.channels | A message was posted to a channel | channels:history | 🗑 |
| message.im | A message was posted in a direct message channel | im:history | 🗑 |

# 1. Start the local server

```
(base) 192:                    $ python3 server.py
Using embedded DuckDB without persistence: data will be transient
 * Serving Flask app 'server'
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on http://127.0.0.1:3000
Press CTRL+C to quit
```

# 2. Start the forwarding host

```
(base) 192:             $ ssh -R          80:127.0.0.1:3000 serveo.net ]
Forwarding HTTP traffic from https://              serveo.net
```

# 3. Start asking questions!

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**Demo**

**Cole** 1:19 PM
Yesterday
@Product Expert ChatBot What paint do you recommend for my bedroom?

**Product Expert ChatBot** APP 1:19 PM
Based on the product information, I would recommend the 1 gal. PPG1012-1 Icy Bay Flat Interior Latex Paint. It has good hide and coverage, easy clean-up, and has a rating of 4.4 out of 5. It's also recommended for use in living rooms, dining rooms, and bedrooms.

**Cole** 1:20 PM
@Product Expert ChatBot Thats a good rating, but how many reviews does it have?

**Product Expert ChatBot** APP 1:20 PM
The 1 gal. PPG1012-1 Icy Bay Flat Interior Latex Paint has 626 reviews.

**Cole** 1:20 PM
@Product Expert ChatBot What's the price?

**Product Expert ChatBot** APP 1:20 PM
The price of the 1 gal. PPG1012-1 Icy Bay Flat Interior Latex Paint is $21.

**Cole** 1:21 PM
@Product Expert ChatBot Are there any other alternatives you'd recommend?

**Product Expert ChatBot** APP 1:22 PM
I can recommend other products based on your preferences. What are your requirements for the paint? Do you have any specific colors or finishes in mind?

**Cole** 1:23 PM
@Product Expert ChatBot I want a glossy paint

**Product Expert ChatBot** APP 1:23 PM
Based on your preference for a glossy finish, I would recommend the 5 gal. PPG1153-1 Ice Castles Satin Interior Paint. It has a rating of 4.9 out of 5, and is a professional quality interior enamel latex paint. It has excellent hiding power and coverage on walls, ceilings and trim, and good interior paint color and sheen uniformity. However, please note that the price is $120.

Message #chatbot-exercise

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**Cole** 5:41 PM
Friday, May 19th
@Product Expert ChatBot What should I buy as a gift for someone who likes woodworking? How much would it cost?

**Product Expert ChatBot** APP 5:41 PM
It depends on your budget. There are several options for someone who likes woodworking. One option is the 3/4 in. x 2 ft. x 4 ft. PureBond Red Oak Plywood Project Panel, which costs $29. Another option is the 1-1/8 in. x 4 ft. x 8 ft. T&G Sheathing Plywood, but the price is not available. If you are looking for something more specific, you may want to consider asking the person directly or doing some more research to find a gift that fits their specific interests and needs.

**Cole** 5:42 PM
@Product Expert ChatBot Interesting. Give me more details about the first option.

**Product Expert ChatBot** APP 5:42 PM
The first option is the 3/4 in. x 2 ft. x 4 ft. PureBond Red Oak Plywood Project Panel. It costs $29 and has a rating of 4.7 out of 5 based on 244 reviews. The product is made with hardwood plywood, which provides strength, performance, and durability. Additionally, it is made with formaldehyde-free, soy-based PureBond adhesive. One of the benefits of this product is that a free custom cut is available.

**Cole** 5:42 PM
@Product Expert ChatBot Is that better than the sheathing plywood you mentioned?

**Product Expert ChatBot** APP 5:43 PM
It depends on what the person you're buying the gift for needs. The 3/4 in. x 2 ft. x 4 ft. PureBond Red Oak Plywood Project Panel is designed for home projects and is made with formaldehyde-free, soy-based PureBond adhesive. The 1-1/8 in. x 4 ft. x 8 ft. T&G Sheathing Plywood is also strong and stable, but it's designed specifically for sheathing purposes. So, it really depends on what the person needs the wood for.

**Cole** 5:43 PM
@Product Expert ChatBot Oh, ok. I think they need it for sheathing.

**Product Expert ChatBot** APP 5:43 PM
In that case, the 1-1/8 in. x 4 ft. x 8 ft. T&G Sheathing Plywood would be a better option as it is specifically designed

Message #chatbot-exercise

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# Future Work

# Potential Improvements

## Web Scraping

- Scrape more products and product data

- Ensure accuracy of sold out, unavailable products

## Servers and Data

- Enable permanent server

- Store info and chat history in database

- Fix memory bugs

## Slack Bot

- Optimize and tune LLM, data processing

- Test with other LLMs

- Add more bot features

# **References**

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- LangChain documentation and tutorials

- Slack documentation

- https://stackoverflow.com/questions/31276001/parse-xml-sitemap-with-python

- https://github.com/Saurav-Shrivastav/Slackbot-tutorial

- https://www.freecodecamp.org/news/scraping-ecommerce-website-with-python/

**THANKS!**

# Any questions?

**SlidesCarnival icons are editable shapes**.

This means that you can:
- Resize them without losing quality.
- Change line color, width and style.

Isn't that nice? :)

Examples: