CS699 Project

Parismita Das
Roll No: 22M0815

Vaibhav Singh
Roll No: 22M0827

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Drugpedia

Contents

Abstract

According to one's definition, the purpose of medicine is "to cure sometimes, to relieve often, to comfort always."[1]. Every medicine has its ingredient list thoroughly checked and verified, but despite that, some detrimental ingredients may be present that the patient is unaware of, or the patient is allergic to. One can look up these ingredients online, doing so will take a lot of efforts as there aren't many platforms that give this data collectively and one might not be able to find any certified information while surfing through the net. Our aim is to implement a platform where a user can find all the details related to the prescribed medicine and its ingredient compositions and their potential roles.

1 Problem Description

Drugpedia aims to incorporate Web Scraping to fetch relevant details regarding a medicine and its composition from major healthcare platforms '1mg' and 'WebMD' and provide users a concise yet reliable information to their request with ease, on a single platform.

2 Proposed Timeline

2.1 First Half

Employing web scraping to display information on medications and their ingredients based on user searches. (For example: Displaying summary of 'Pan-40' medicine based on user search)

Relevant information to be shown: Medicine usage, potential side effects and its composition.
Website to be used for scraping: **Tata 1mg (`https://www.1mg.com/`)**

2.2 Second Half

Employing web scraping to display summary of medicine ingredient (For example: Summary of the key ingredient of 'Pan-40' medication i.e. pantoprazole).

Relevant information to be shown: summary of the medicine's composition.
Website to be used for scraping: **WebMD (`https://www.webmd.com/drugs/2/index`)**

3 Installation and User Guidelines

To install the package, we need to clone the repository as follows. To clone via terminal

```
clone https://github.com/parismita/Drugpedia.git
```

Or we can directly download the zip package from github project page. After cloning, to install the application, goto the cloned folder Drugpedia and run the following command in terminal to install the python package.

```
make setup
```

Note: The dependencies are mentioned in requirement.txt file. With this the installation for python package is complete.

To run the application just run the command *make* in terminal inside the Drugpedia directory. This will start the development server at

```
http://localhost:8080
```

Now, we have to goto the browser and open the main page which is hosted on the above address.
Note: with this the website will fetch the data via web scraping and this data will not be stored in postgres database

To use the database feature which will store and retrieve the data from local postgreSQL, we need to install postgreSQL.
Database creation is as follows using psql

```
CREATE DATABASE drugpedia;
```

Here I am creating the database named drugpedia, we can create the database with any name. To connect to the database we need to include these into the .env file where my user is postgres which is the default user created by postgreSQL, the database is drugpedia and my postgres is running in localhost at port 5432

```
USER=postgres
HOST=localhost
PASS=yourpassword
DB=drugpedia
POST=5432
```

Note: we need to create the .env file inside the project directory. After connecting to the database, we need to create the tables which can be done by using this api in our browser.

```
localhost:8080/create
```

This will automatically create the required tables.

Now we are done with all installations and ready to use the website. Examples to use the APIs for searching for medicine and ingredients is given as follows

```
http://localhost:8080/medicine/search-json?key=pan
http://localhost:8080/ingredient/search-json?key=cro
```

Example to use the API endpoints for detail page

```
http://localhost:8080/medicine/details-json
http://localhost:8080/ingredient/details-json
```

With query params id and name which corresponds to the link and name from search results for both APIs. These will give us JSON response and if we want to browse through the website we can do it at

```
localhost:8080
```

4 Code Structure

Here's the higher level view of the file structure, for more detailed view please check on this link

- src - has the backend and frontend code
  - controllers - Rendering the pages and re-directions are written here.
    - homecontroller.py - render the main page
    - ingcontroller.py - controller for ingredient module
    - medcontroller.py - controller for medicine module
  - models - the SQLAlchemy models for the tables
    - medicine.py - The medicine table's model
    - ingredient.py - The ingredient table's model
  - services - main logic is written here
    - medservice.py - modules for CRUD, search and details of medicine
    - ingservice.py - modules for CRUD, search and details of ingredient
  - routes - routing on given urls
    - homeroute.py - main page route
    - ingroute.py - ingredient module routes
    - medroute.py - medicine module routes
  - utils - utility files
    - initdb.py - initializing the database here
  - template - contain the html codes
    - search-ingredient.html
    - search-ingredient-results.html
    - ingredient-details.html
    - index.html
    - search-results.html
    - medicine-details.html
- test - For unit testing
  - test.py - For unit testing, currently no tests there
- main.py - Creating the application, connecting to postgres here.
- Makefile - Build and Run the application, linting and installation of dependencies
- requirement.txt - The dependencies
- documentation - Contains this manual

5 Some Important Functions

- MedSearch(key) - the module for searching the medicine names, it takes the user input value to be searched as argument and returns the dict of medicine list. It calls two seperate search functions to do webscraping from otc and drugs lists and combine the results into one dataframe.
- MedDetails(id, name) - the module for the medicine summary, it takes the unique url and name to medicine as argument and returns the dict of medicine data. The details for otc and drugs are computed seperately and combined in this function.
- OtcDetails(content) - takes the parsed html as input and returns dict of otc summary
- DrugDetails(content) - takes the parsed html as input and returns dict of drugs summary
- IngredientDetails(id, name) - the module for the medicine summary, it takes the unique url and name to medicine as argument and returns the dict of ingredient data.
- IngredientSearch(key) - the module for searching the medicine names, it takes the user input value to be searched as argument and returns the dict of ingredient list.
- create_db() - creates the postgreSQL tables

6 Stack Used

The languages used are Python, HTML and Makefile. The dependencies for python are mentioned in requirement.txt file. For storing the data we used PostgreSQL. Version control is done via Github.

7 Results

7.1 UI for Medicine search

The front-end of our project has been successfully implemented using HTML, Internal CSS and Bootstrap 5.2 front-end toolkit. Users can search for a medicine by brand on the homepage of the website (See Fig. 1), or they can navigate to the ingredient search page, where they can search for a medicine's ingredient by name (See Fig. 2).

Once the user searches for a particular medicine, we return the number of medicines that match the user query, scraped from 1mg. This list is visible to the user after he is redirected to the medicine search results page. Fig. 3 showcases the results obtained post scraping for the user search of *'crocin'*. Now, the user

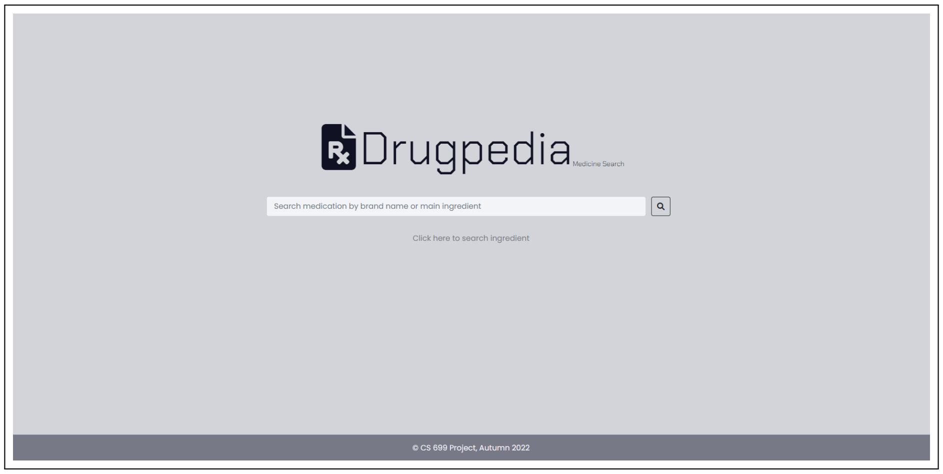
Drugpedia
Medicine Search
Search medication by brand name or main ingredient
Click here to search ingredient
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Figure 1: Landing page for medicine search, where a user can search for a medicine by brand or main ingredient.

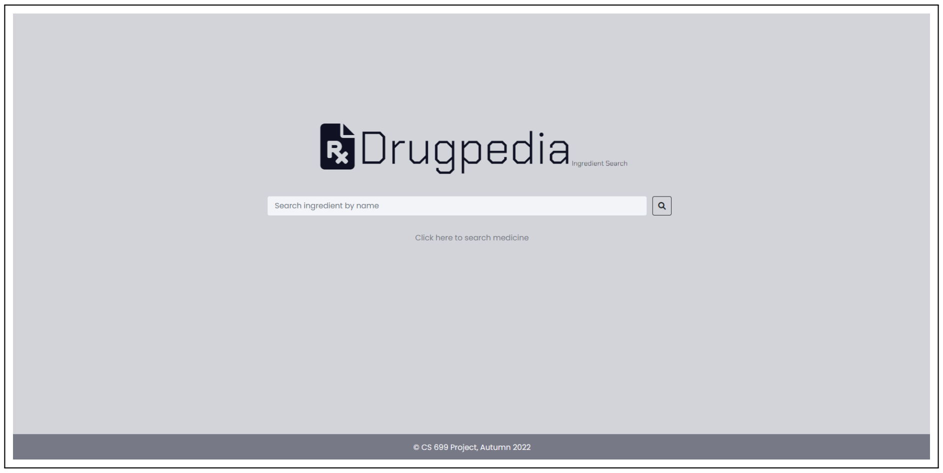
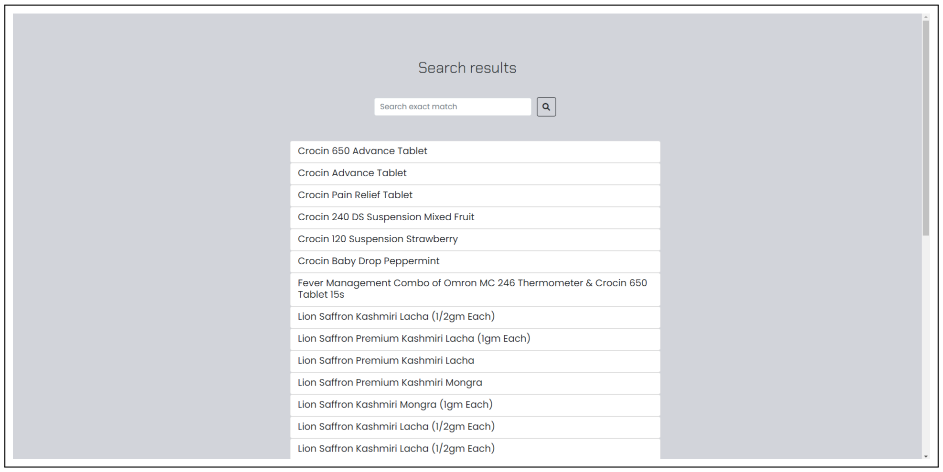

Drugpedia
Ingredient Search
Search ingredient by name
Click here to search medicine
© CS 699 Project, Autumn 2022

Figure 2: Landing page for ingredient search, where a user can search for a medicine's ingredient by name.

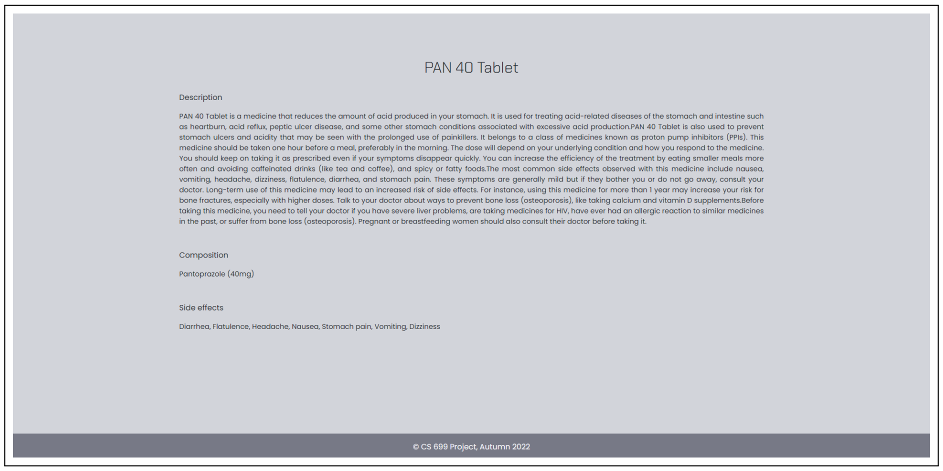


Search results

Search exact match

Crocin 650 Advance Tablet
Crocin Advance Tablet
Crocin Pain Relief Tablet
Crocin 240 DS Suspension Mixed Fruit
Crocin 120 Suspension Strawberry
Crocin Baby Drop Peppermint
Fever Management Combo of Omron MC 246 Thermometer & Crocin 650 Tablet 15s
Lion Saffron Kashmiri Lacha (1/2gm Each)
Lion Saffron Premium Kashmiri Lacha (1gm Each)
Lion Saffron Premium Kashmiri Lacha
Lion Saffron Premium Kashmiri Mongra
Lion Saffron Kashmiri Mongra (1gm Each)
Lion Saffron Kashmiri Lacha (1/2gm Each)
Lion Saffron Kashmiri Lacha (1/2gm Each)

Figure 3: Search results page, showing the number of matches found on 1mg for a particular medicine searched by the user.



PAN 40 Tablet

Description

PAN 40 Tablet is a medicine that reduces the amount of acid produced in your stomach. It is used for treating acid-related diseases of the stomach and intestine such as heartburn, acid reflux, peptic ulcer disease, and some other stomach conditions associated with excessive acid production.PAN 40 Tablet is also used to prevent stomach ulcers and acidity that may be seen with the prolonged use of painkillers. It belongs to a class of medicines known as proton pump inhibitors (PPIs). This medicine should be taken one hour before a meal, preferably in the morning. The dose will depend on your underlying condition and how you respond to the medicine. You should keep on taking it as prescribed even if your symptoms disappear quickly. You can increase the efficiency of the treatment by eating smaller meals more often and avoiding caffeinated drinks (like tea and coffee), and spicy or fatty foods.The most common side effects observed with this medicine include nausea, vomiting, headache, dizziness, flatulence, diarrhea, and stomach pain. These symptoms are generally mild but if they bother you or do not go away, consult your doctor. Long-term use of this medicine may lead to an increased risk of side effects. For instance, using this medicine for more than 1 year may increase your risk for bone fractures, especially with higher doses. Talk to your doctor about ways to prevent bone loss (osteoporosis), like taking calcium and vitamin D supplements.Before taking this medicine, you need to tell your doctor if you have severe liver problems, are taking medicines for HIV, have ever had an allergic reaction to similar medicines in the past, or suffer from bone loss (osteoporosis). Pregnant or breastfeeding women should also consult their doctor before taking it.

Composition

Pantoprazole (40mg)

Side effects

Diarrhea, Flatulence, Headache, Nausea, Stomach pain, Vomiting, Dizziness

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Figure 4: Medicine details page, showing the details of the exact matched medicine retrieved from 1mg.

can select the medicine which matches by exact name, and search for its details. Fig 4. shows the detailed view of a exact name-matched medicine (*'PAN 40 Tablet'*). Medicine's description, composition and side effects are scraped from 1mg and returned on the medicine details page.

7.2 UI for ingredient search

A similar flow was incorporated to return uses, side effects and precautions related to a medicine's ingredient (*'paracetamol'*), scraped from WebMD. (See Fig. 5 and Fig. 6).

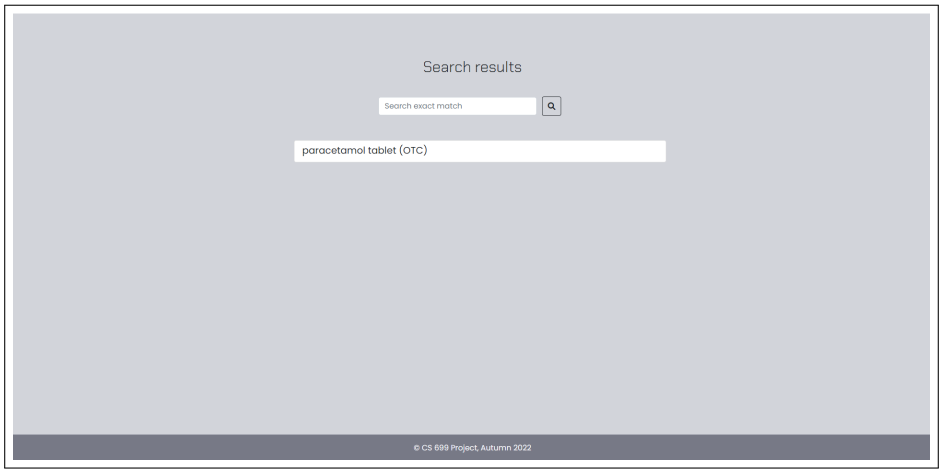
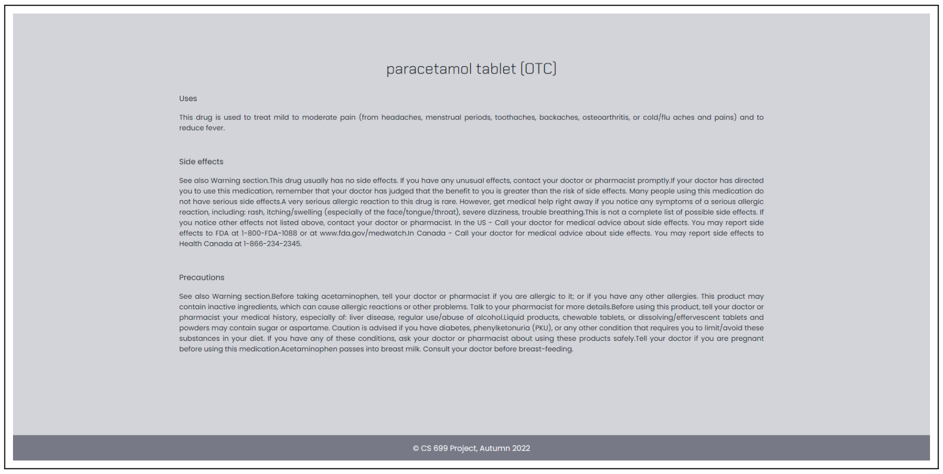


Figure 5: Search results page, showing the number of matches found on WebMD for a particular ingredient searched by the user.


paracetamol tablet (OTC)

Uses

This drug is used to treat mild to moderate pain (from headaches, menstrual periods, toothaches, backaches, osteoarthritis, or cold/flu aches and pains) and to reduce fever.

Side effects

See also Warning section.This drug usually has no side effects. If you have any unusual effects, contact your doctor or pharmacist promptly.If your doctor has directed you to use this medication, remember that your doctor has judged that the benefit to you is greater than the risk of side effects. Many people using this medication do not have serious side effects.A very serious allergic reaction to this drug is rare. However, get medical help right away if you notice any symptoms of a serious allergic reaction, including: rash, itching/swelling (especially of the face/tongue/throat), severe dizziness, trouble breathing.This is not a complete list of possible side effects. If you notice other effects not listed above, contact your doctor or pharmacist. In the US - Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088 or at www.fda.gov/medwatch.In Canada - Call your doctor for medical advice about side effects. You may report side effects to Health Canada at 1-866-234-2345.

Precautions

See also Warning section.Before taking acetaminophen, tell your doctor or pharmacist if you are allergic to it; or if you have any other allergies. This product may contain inactive ingredients, which can cause allergic reactions or other problems. Talk to your pharmacist for more details.Before using this product, tell your doctor or pharmacist your medical history, especially of: liver disease, regular use/abuse of alcohol.Liquid products, chewable tablets, or dissolving/effervescent tablets and powders may contain sugar or aspartame. Caution is advised if you have diabetes, phenylketonuria (PKU), or any other condition that requires you to limit/avoid these substances in your diet. If you have any of these conditions, ask your doctor or pharmacist about using these products safely.Tell your doctor if you are pregnant before using this medication.Acetaminophen passes into breast milk. Consult your doctor before breast-feeding.

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Figure 6: Ingredient details page, showing the details of the exact matched ingredient retrieved from WebMD.

8 Future Scope

- Incorporating scraped data from region specific medicine encyclopedias to include information of medicine brands specific to the region. E.g. `Drugs.com` provides drug information for medicines primarily available in the US.
- Incorporating scraped data from **’WHODrug Global’**. WHODrug data includes herbal remedies too, along with conventional medicine information.

9 Conclusion

Drugpedia runs on the browser, making it easily accessible. Scraping and displaying only relevant information of a medicine will help users to reduce browsing time.

References

[1] Edward Livingston Trudeau, To Comfort Always, Independently Published, 2016, ISBN 1519051077, 9781519051073

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