SASTA OLIPHANT SCIENCE AWARDS

Highly Commended

Programming, Apps & Robotics

Year 7-8

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St Peter's Collegiate Girls' School

Oliphant Science Awards **Ania Choi** **30 Jun 2023**

Magic Herbot

1. Introduction

This report is to summarise the development of a web application called Magic Herbot powered by Artificial Intelligence (AI) to access the uses of herbal medicines and relevant advice for people with common ailments such as headaches, sore throat and coughing.

2. Science Idea

When I feel sick, I usually turn to herbal remedies to help me feel better, but of course, when the sickness is severe, I would consult a general practitioner for a prescription. The major benefits of using herbal medicine to ease unwellness include low cost, easily accessible and fewer side effects.

Herbal medicine originates in different ancient cultures and had powerful ingredients. It should be taken with caution and is equally as powerful as pharmaceutical medications. However, it is always inconvenient to search for the right herbs to use. Another issue is that there is little information about the active chemical constituents. This is why I would like to create a user-friendly way to access this information and research more about it.

The main goal is to provide easily accessible medical advice for people with common ailments. I achieve this by conducting thorough scientific research on herbal science and remedies and gaining knowledge in computer programming. During this and last school term, I learned the technology and application of AI and programming in Phyton. I feel amazed about the power of AI to effectively provide solutions derived from massive of information. Additionally, AI systematically provides information that normally acquires humans to spend significant effort. I have a great interest in using Phyton and AI to turn my idea above into an application.

Hence, I develop Magic Herbot, my first web application. Instead of consulting a practitioner, people with mild symptoms can seek advice from an AI to easily access herbal medicine information to make references for action.

3. Methodology

In developing Magic Herbot, I make use of AI technology to analyse herbal medicine information. AI can be modelled as a child in the process of learning. Since AI arrives in this world without knowing anything, it does not know how to differentiate right and wrong.

Therefore, it needs training to familiarise itself with various tasks. Below are descriptions of AI in adaptive learning in herbal medicine.

Throughout the programming, I used AI to generate responses. The AI algorithm is a wide area that consists of Machine Learning Algorithms and Deep Learning Algorithms. On a website of AI, Ridzuan[9] made a comparison between Deep Learning Algorithms and Machine Learning Algorithms. The website mentioned that Machine Learning Algorithms are algorithms that use large amounts of data for training computers. Deep Learning Algorithms are a branch of Machine Learning Algorithms that use a complex level of Artificial Neural Networks (ANNs) to complete the main process of Machine Learning and achieve high accuracy in tasks such as speech recognition, self-driving car and sentence generator.

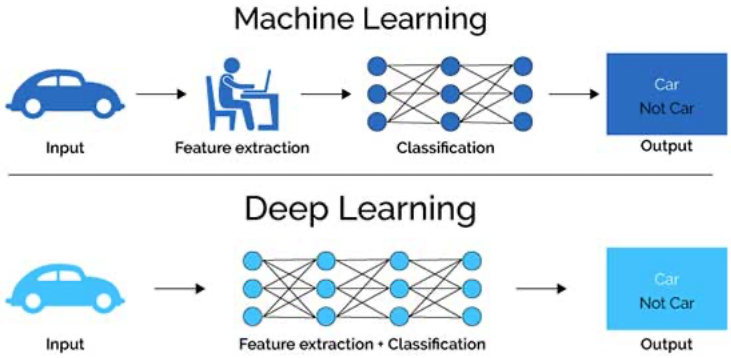


Figure 1: Deep Learning vs Machine Learning

Machine Learning is divided into three sectors: Supervised Learning, Unsupervised Learning and Reinforcement Learning. Diagnosis belongs to the Supervised Learning section, which is what the programming is for.

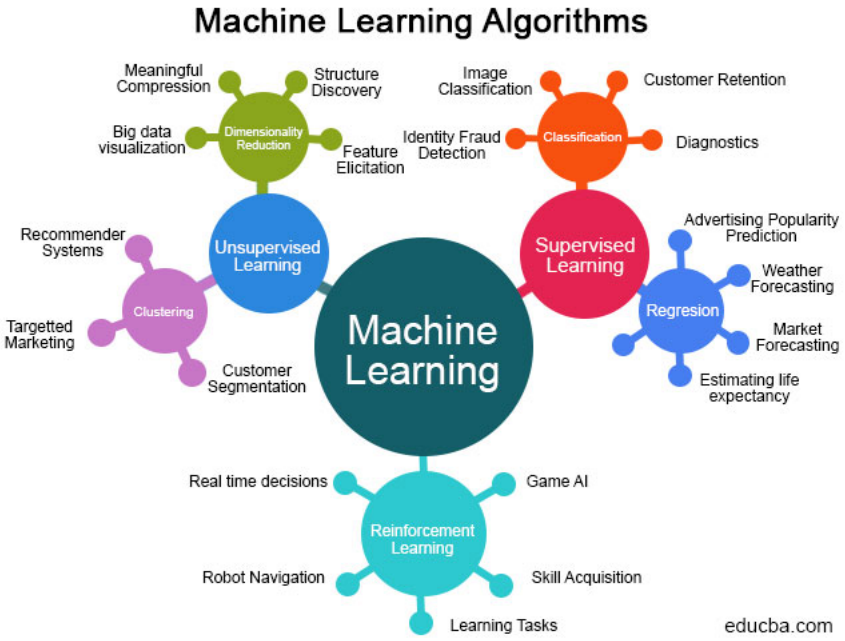


Figure 2: Sectors of Machine Learning Algorithms

3.1. Herbal Medicine

Prior to developing Magic Herbot, I investigated the mechanism of uses and effects of herbal medicine. Herbs can have medical impacts on body parts. The following diagram illustrates the mechanism.

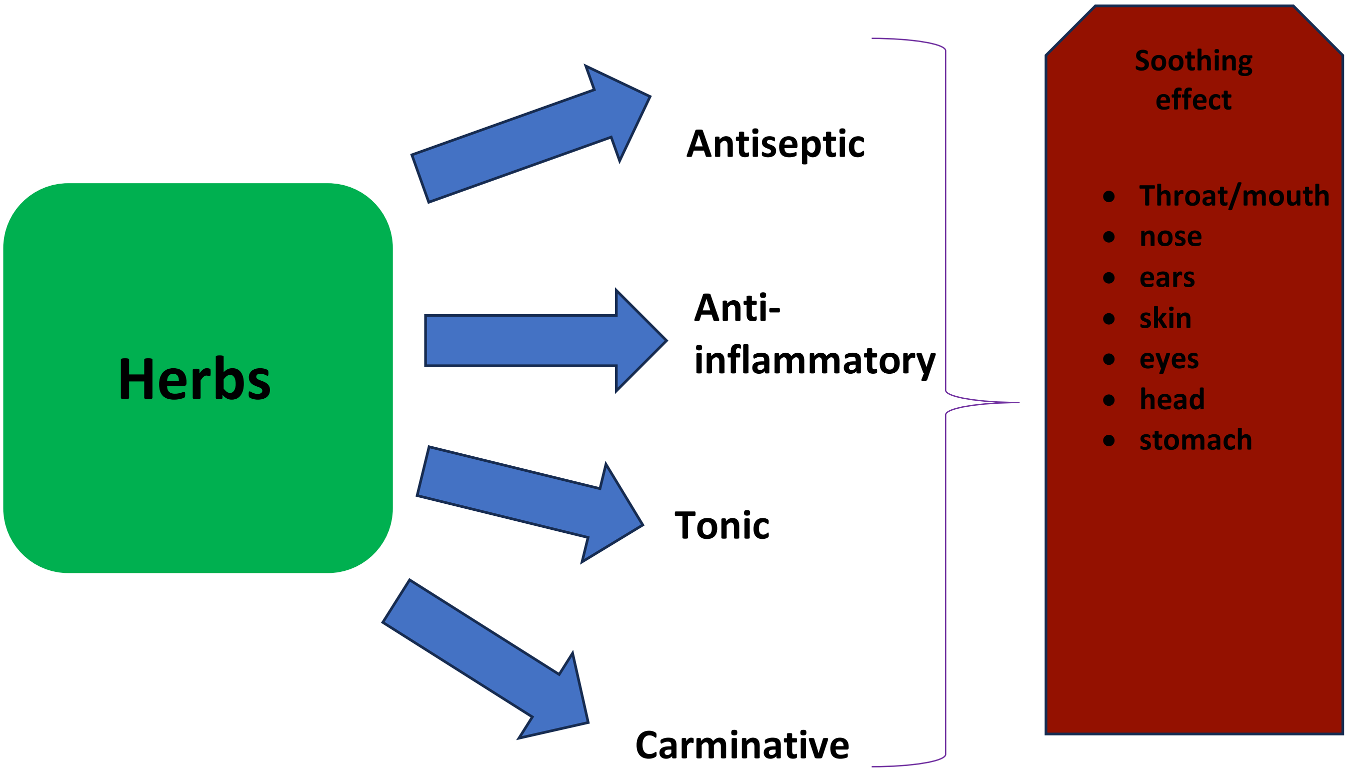
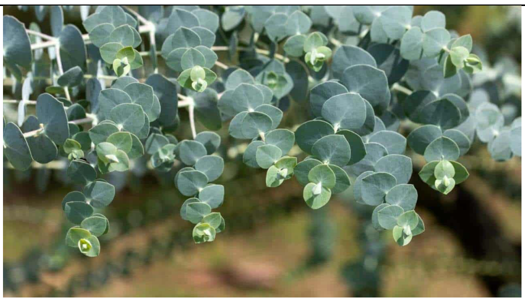
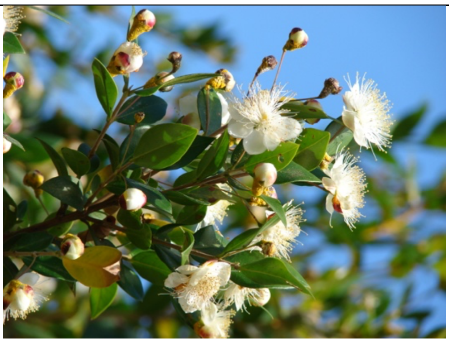
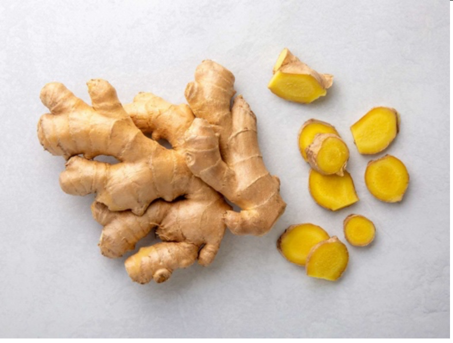
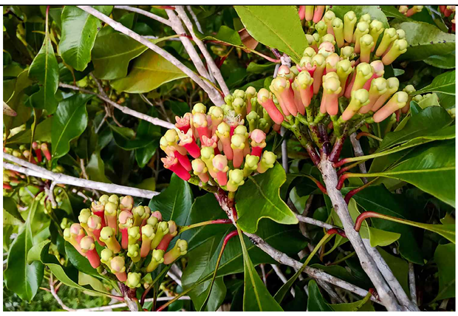
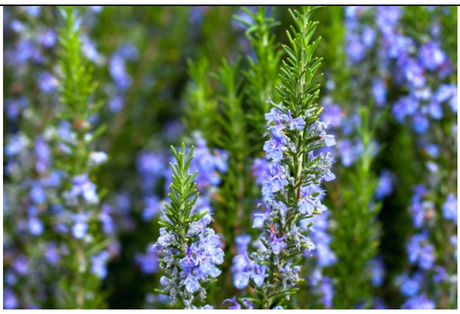
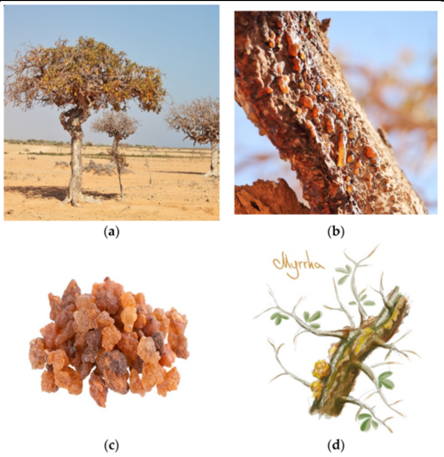


Figure 3: Mechanism of uses and effects of herbal medicine

Examples of some common herbs that have medical uses are summarised below.

#	Herbs	Photo	Medical Actions & Uses
1	Lavender		• Ease nervous system • Soothe indigestion • Antispasmodic • Relieve anxiety

#	Herbs	Photo	Medical Actions & Uses
2	Eucalyptus (Blue Gum)		• Ease nervous system • Antiseptic • Analgesic • Expectorant
3	Myrtle		• Astringent • Antiseptic • Remedy of digestive and urinary systems • Sooth respiratory system
4	Ginger		• Anti-inflammatory • Circulatory stimulant • Antiviral • Digestive stimulant
5	Clove		• Antiseptic • Carminative • Analgesic • Prevents vomiting
6	Rosemary		• Tonic • Astringent • Nervine • Anti-inflammatory

#	Herbs	Photo	Medical Actions & Uses
7	Cypress		• Astringent • Antispasmodic • Tonic • Soothes flu and sore throats
8	Helichrysum		• Wound healer • Anti-inflammatory • Anti-fungal • Anti-bacterial
9	Myrrh		• Wound healer • Anti-inflammatory • Astringent • Antiparasitic
10	Frankincense		• Wound healer • Anti-inflammatory • Astringent • Antiparasitic

#	Herbs	Photo	Medical Actions & Uses
11	Peppermint		• Antispasmodic • Analgesic • Carminative • Antimicrobial
12	Cinnamon		• Warming stimulant • Anti-diabetic • Anti-fungal • Antimicrobial

3.2. Programming Requirements

Magic Herbot is developed based on the following programming requirements.

- Programming language: Python
- Customised components: Gradio
- AI engine: Openai
- Editor: Mu Editor

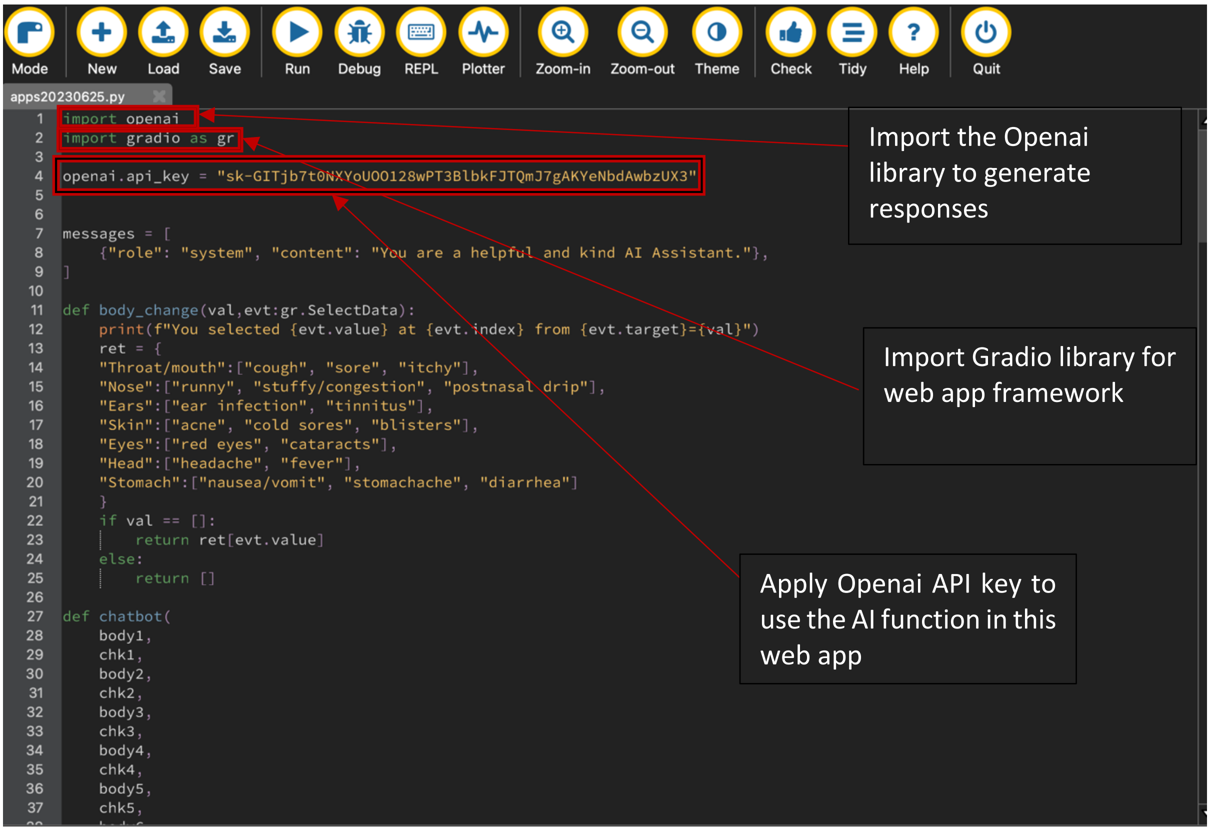
I use Python and Mu Editor because it is easy to understand and systematic. Python is a programming language and Mu Editor is an editor that assists me to write my code. Openai is a research laboratory to develop and direct AI which has been trained on massive data from a variety of sources. Such that the responses generated can be more accurate in response to users' input in a personalised and automated way.

Gradio is a Python package that has customizable components which is a way to demo Machine Learning using a few lines of code. Similar to the use of Openai, I used Gradio to develop a function to generate the response. These programming languages and platforms that I used helped me create Magic Herbot.

3.3. Programming

A hard copy of the programme of Magic Herbot is attached in Appendix A and detailed explanations are found in this section. The steps to develop Magic Herbot are shown below with annotated screenshots.

Step 1: Import library



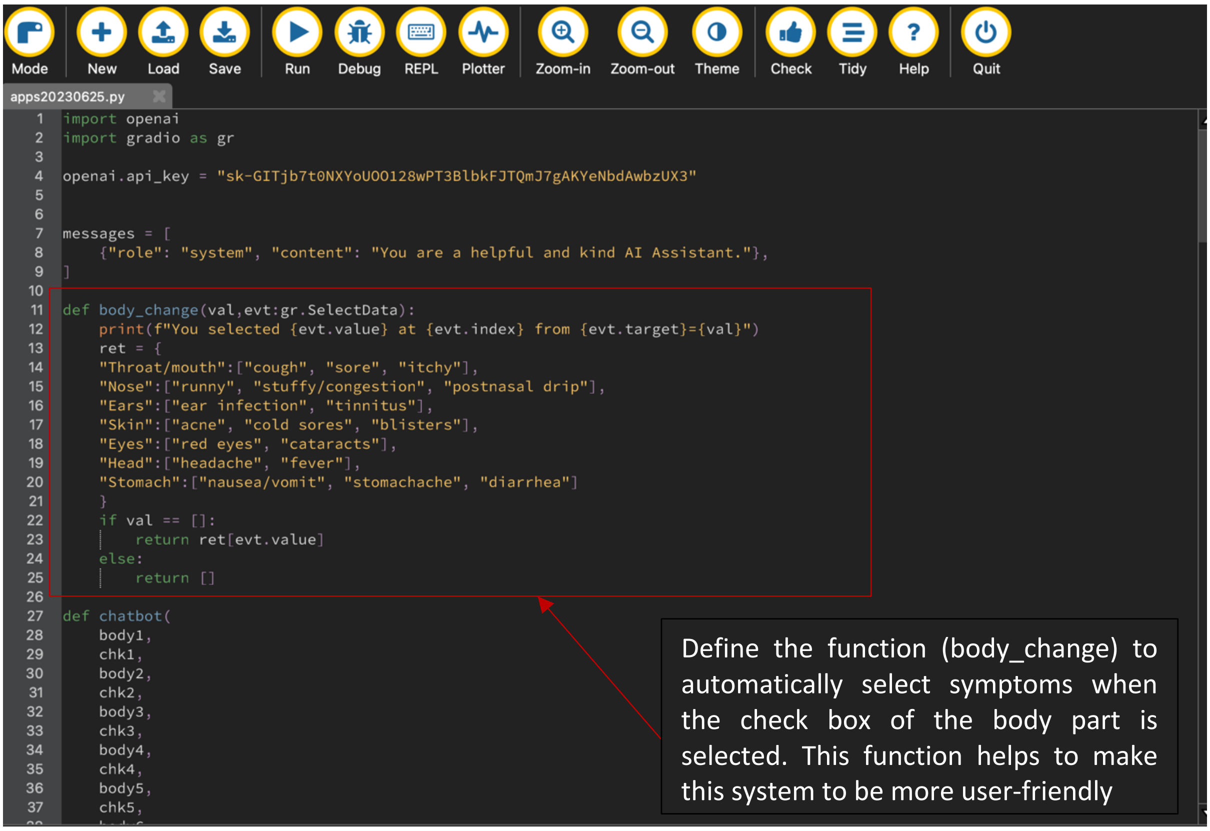
```python
import openai
import gradio as gr

openai.api_key = "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"


messages = [
    {"role": "system", "content": "You are a helpful and kind AI Assistant."},
]

def body_change(val,evt:gr.SelectData):
    print(f"You selected {evt.value} at {evt.index} from {evt.target}={val}")
    ret = {
    "Throat/mouth":["cough", "sore", "itchy"],
    "Nose":["runny", "stuffy/congestion", "postnasal drip"],
    "Ears":["ear infection", "tinnitus"],
    "Skin":["acne", "cold sores", "blisters"],
    "Eyes":["red eyes", "cataracts"],
    "Head":["headache", "fever"],
    "Stomach":["nausea/vomit", "stomachache", "diarrhea"]
    }
    if val == []:
        return ret[evt.value]
    else:
        return []

def chatbot(
    body1,
    chk1,
    body2,
    chk2,
    body3,
    chk3,
    body4,
    chk4,
    body5,
    chk5,
```

Import the Openai library to generate responses

Import Gradio library for web app framework

Apply Openai API key to use the AI function in this web app

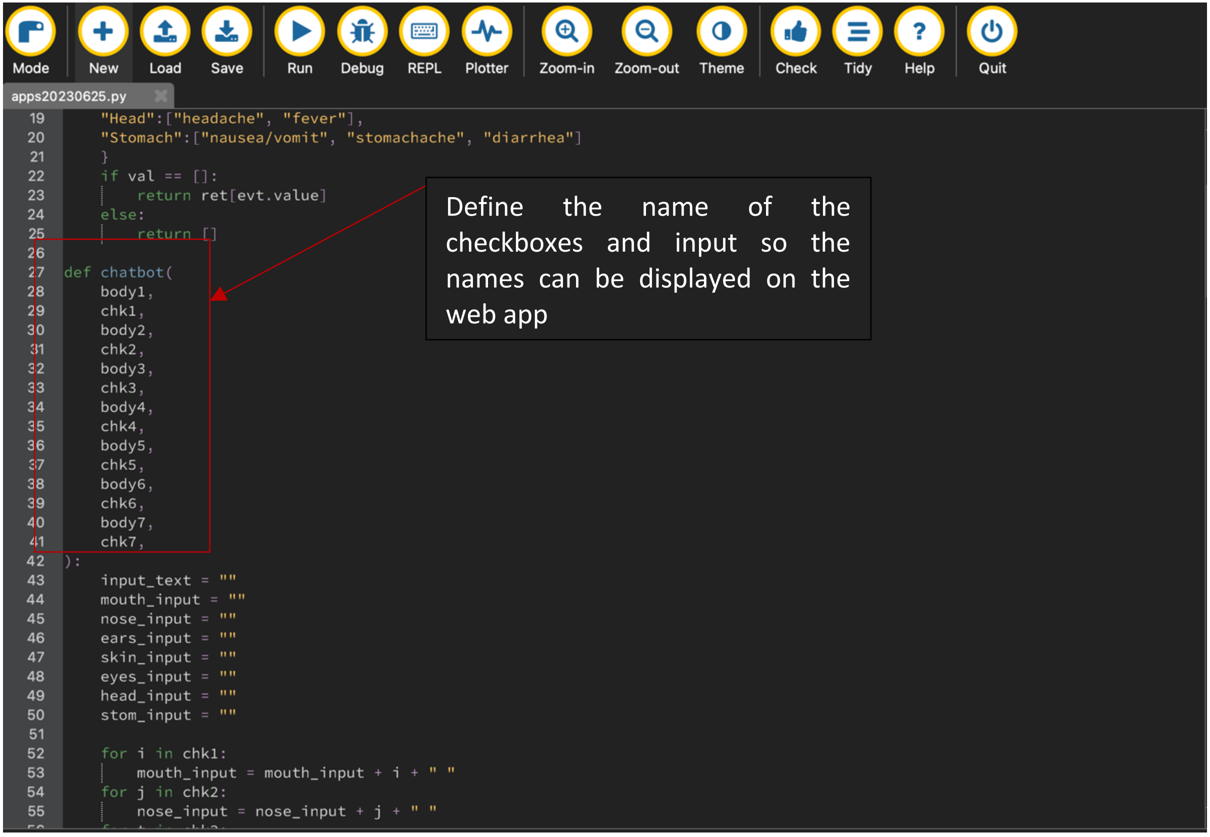
Step 2: Define the function of body_change



```python
import openai
import gradio as gr

openai.api_key = "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"


messages = [
    {"role": "system", "content": "You are a helpful and kind AI Assistant."},
]

def body_change(val,evt:gr.SelectData):
    print(f"You selected {evt.value} at {evt.index} from {evt.target}={val}")
    ret = {
    "Throat/mouth":["cough", "sore", "itchy"],
    "Nose":["runny", "stuffy/congestion", "postnasal drip"],
    "Ears":["ear infection", "tinnitus"],
    "Skin":["acne", "cold sores", "blisters"],
    "Eyes":["red eyes", "cataracts"],
    "Head":["headache", "fever"],
    "Stomach":["nausea/vomit", "stomachache", "diarrhea"]
    }
    if val == []:
        return ret[evt.value]
    else:
        return []

def chatbot(
    body1,
    chk1,
    body2,
    chk2,
    body3,
    chk3,
    body4,
    chk4,
    body5,
    chk5,
```

Define the function (body_change) to automatically select symptoms when the check box of the body part is selected. This function helps to make this system to be more user-friendly

Step 3: Define the functions of chatbot

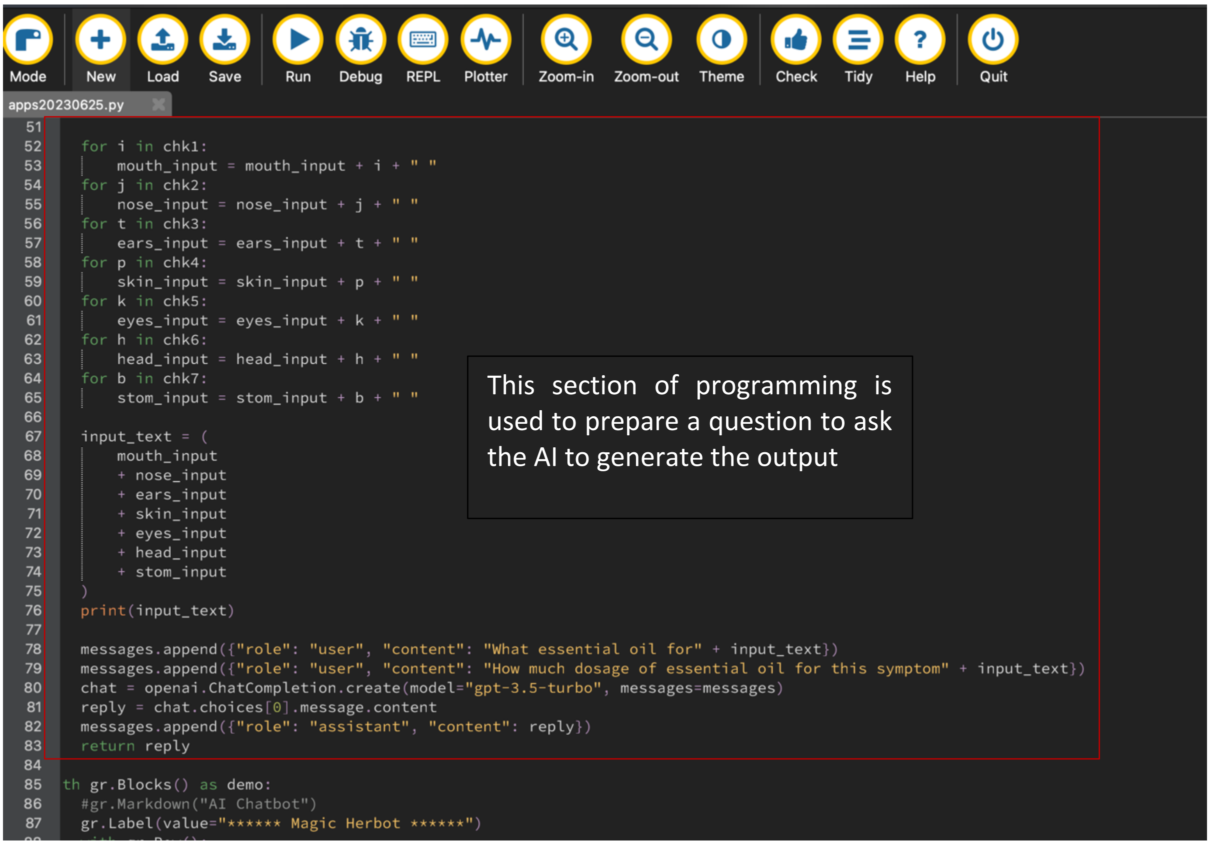


```python
    "Head":["headache", "fever"],
    "Stomach":["nausea/vomit", "stomachache", "diarrhea"]
    }
    if val == []:
        return ret[evt.value]
    else:
        return []

def chatbot(
    body1,
    chk1,
    body2,
    chk2,
    body3,
    chk3,
    body4,
    chk4,
    body5,
    chk5,
    body6,
    chk6,
    body7,
    chk7,
):
    input_text = ""
    mouth_input = ""
    nose_input = ""
    ears_input = ""
    skin_input = ""
    eyes_input = ""
    head_input = ""
    stom_input = ""

    for i in chk1:
        mouth_input = mouth_input + i + " "
    for j in chk2:
        nose_input = nose_input + j + " "
```

Define the name of the checkboxes and input so the names can be displayed on the web app



```

    for i in chk1:
        mouth_input = mouth_input + i + " "
    for j in chk2:
        nose_input = nose_input + j + " "
    for t in chk3:
        ears_input = ears_input + t + " "
    for p in chk4:
        skin_input = skin_input + p + " "
    for k in chk5:
        eyes_input = eyes_input + k + " "
    for h in chk6:
        head_input = head_input + h + " "
    for b in chk7:
        stom_input = stom_input + b + " "

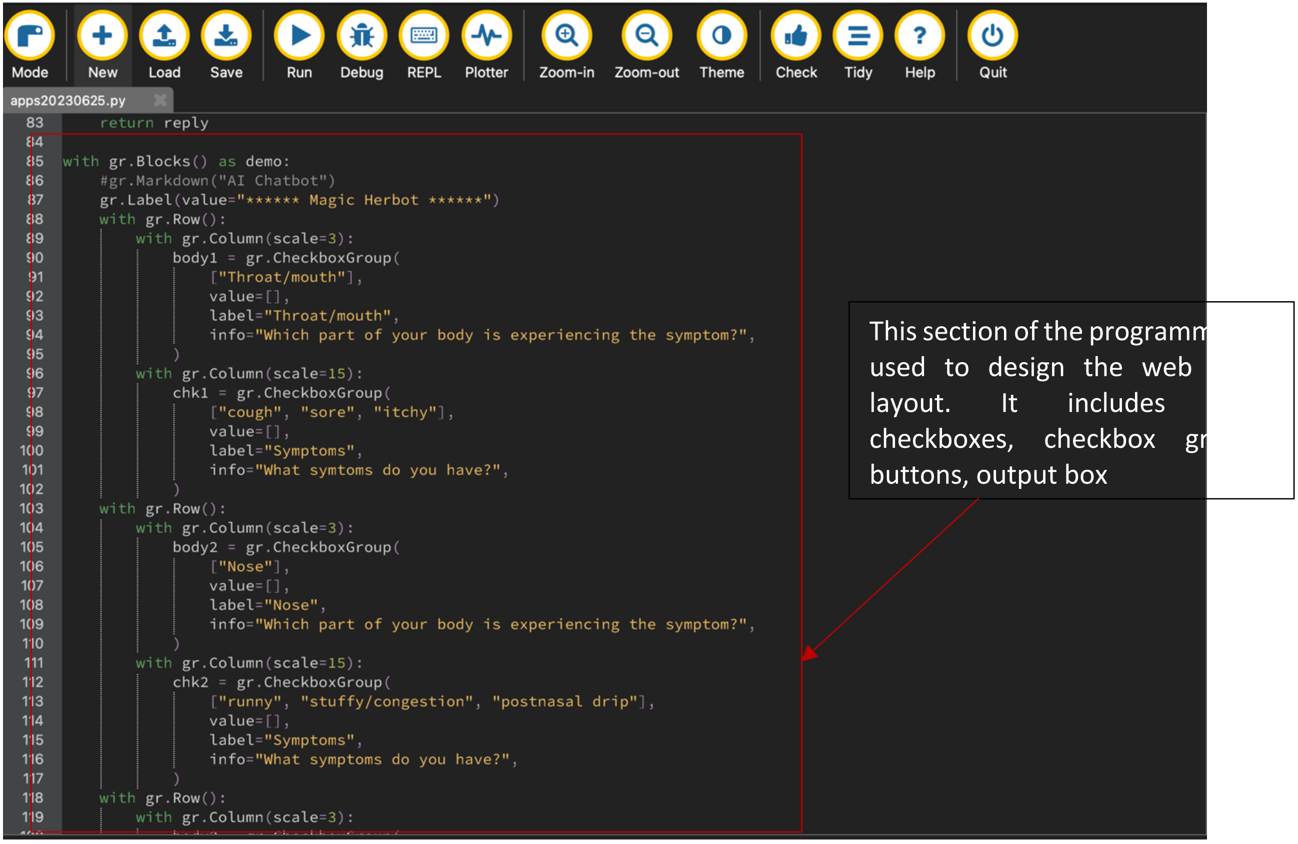
    input_text = (
        mouth_input
        + nose_input
        + ears_input
        + skin_input
        + eyes_input
        + head_input
        + stom_input
    )
    print(input_text)

    messages.append({"role": "user", "content": "What essential oil for" + input_text})
    messages.append({"role": "user", "content": "How much dosage of essential oil for this symptom" + input_text})
    chat = openai.ChatCompletion.create(model="gpt-3.5-turbo", messages=messages)
    reply = chat.choices[0].message.content
    messages.append({"role": "assistant", "content": reply})
    return reply

  th gr.Blocks() as demo:
    #gr.Markdown("AI Chatbot")
    gr.Label(value="****** Magic Herbot ******")
```

This section of programming is used to prepare a question to ask the AI to generate the output

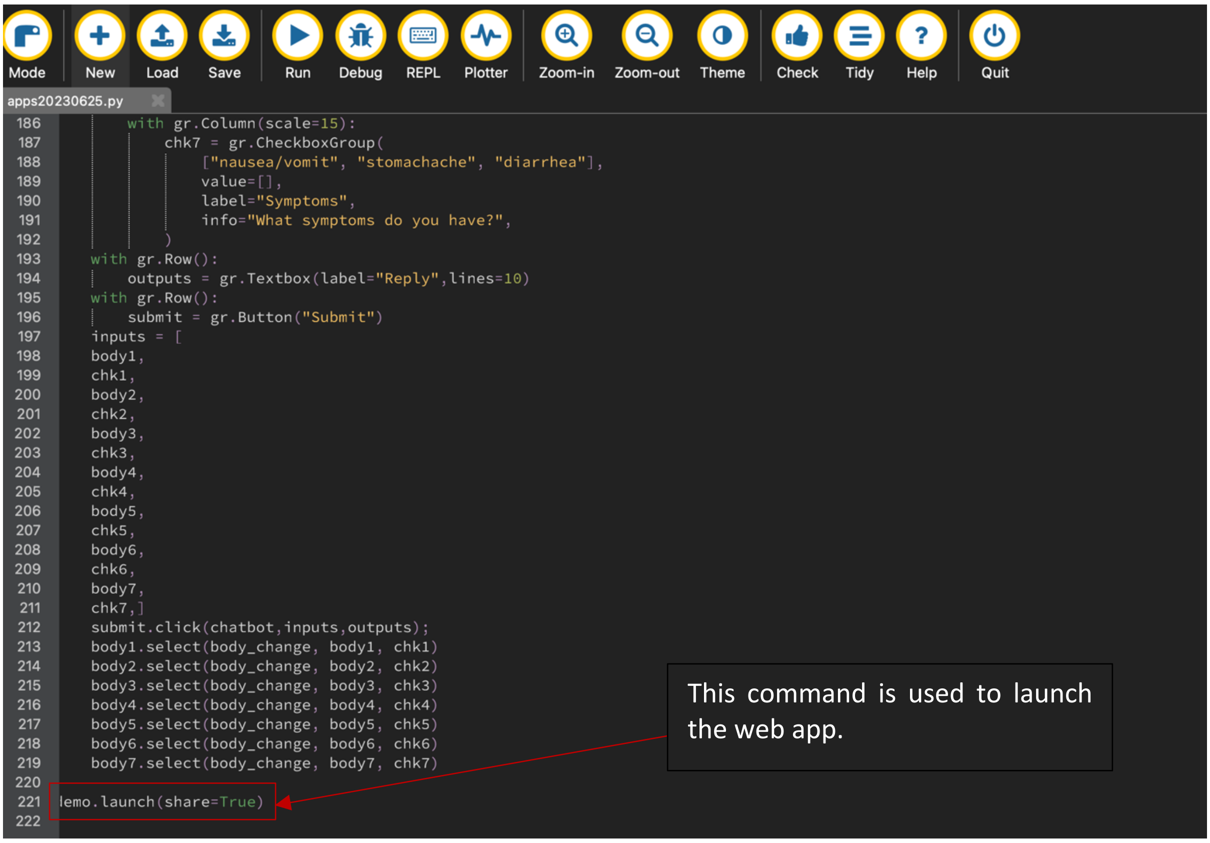
Step 4: Web app layout design



```
    return reply

with gr.Blocks() as demo:
    #gr.Markdown("AI Chatbot")
    gr.Label(value="****** Magic Herbot ******")
    with gr.Row():
        with gr.Column(scale=3):
            body1 = gr.CheckboxGroup(
                ["Throat/mouth"],
                value=[],
                label="Throat/mouth",
                info="Which part of your body is experiencing the symptom?",
            )
        with gr.Column(scale=15):
            chk1 = gr.CheckboxGroup(
                ["cough", "sore", "itchy"],
                value=[],
                label="Symptoms",
                info="What symtoms do you have?",
            )
    with gr.Row():
        with gr.Column(scale=3):
            body2 = gr.CheckboxGroup(
                ["Nose"],
                value=[],
                label="Nose",
                info="Which part of your body is experiencing the symptom?",
            )
        with gr.Column(scale=15):
            chk2 = gr.CheckboxGroup(
                ["runny", "stuffy/congestion", "postnasal drip"],
                value=[],
                label="Symptoms",
                info="What symptoms do you have?",
            )
    with gr.Row():
        with gr.Column(scale=3):
```

This section of the programm used to design the web layout. It includes checkboxes, checkbox gr buttons, output box



```
        with gr.Column(scale=15):
            chk7 = gr.CheckboxGroup(
                ["nausea/vomit", "stomachache", "diarrhea"],
                value=[],
                label="Symptoms",
                info="What symptoms do you have?",
            )
    with gr.Row():
        outputs = gr.Textbox(label="Reply",lines=10)
    with gr.Row():
        submit = gr.Button("Submit")
    inputs = [
    body1,
    chk1,
    body2,
    chk2,
    body3,
    chk3,
    body4,
    chk4,
    body5,
    chk5,
    body6,
    chk6,
    body7,
    chk7,]
    submit.click(chatbot,inputs,outputs);
    body1.select(body_change, body1, chk1)
    body2.select(body_change, body2, chk2)
    body3.select(body_change, body3, chk3)
    body4.select(body_change, body4, chk4)
    body5.select(body_change, body5, chk5)
    body6.select(body_change, body6, chk6)
    body7.select(body_change, body7, chk7)

demo.launch(share=True)

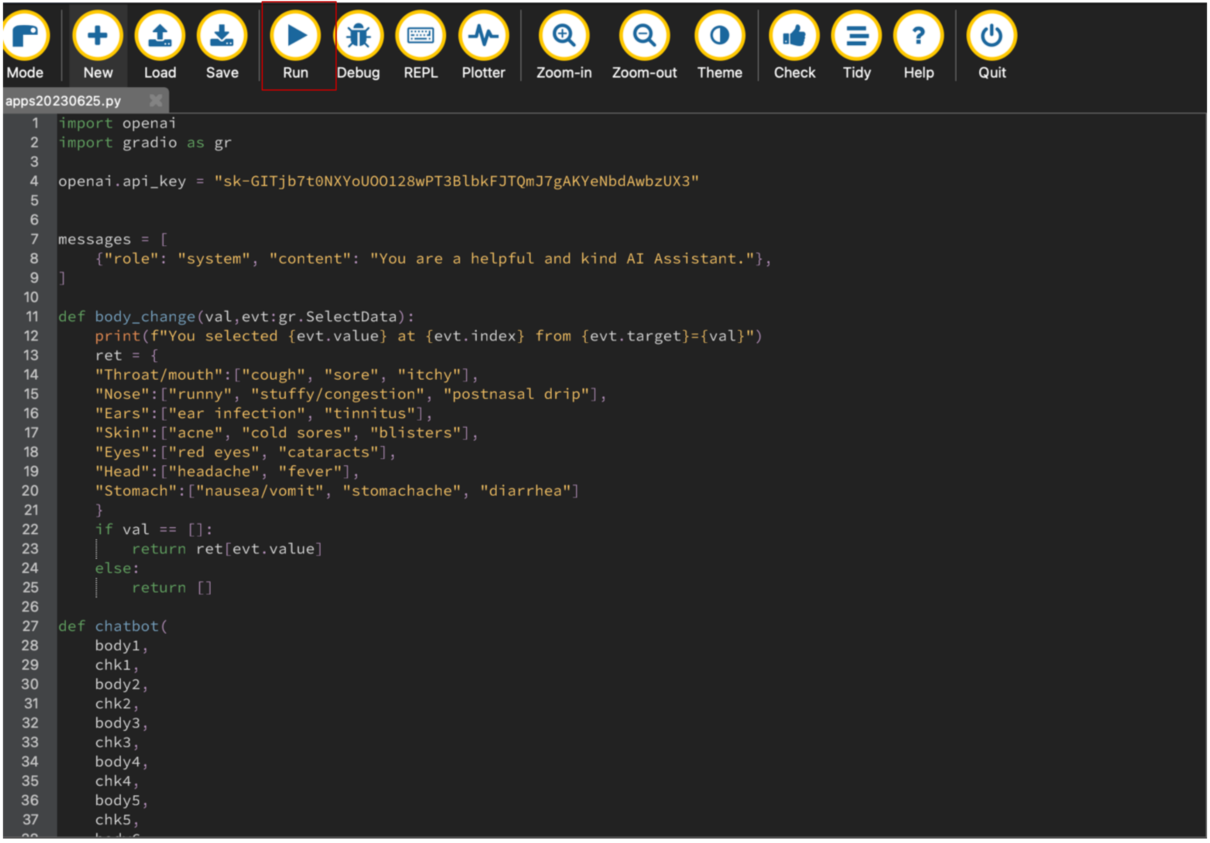
```

This command is used to launch the web app.

4. Results

The steps listed below are to execute Magic Herbot to generate results.

Step 1: Run the programming



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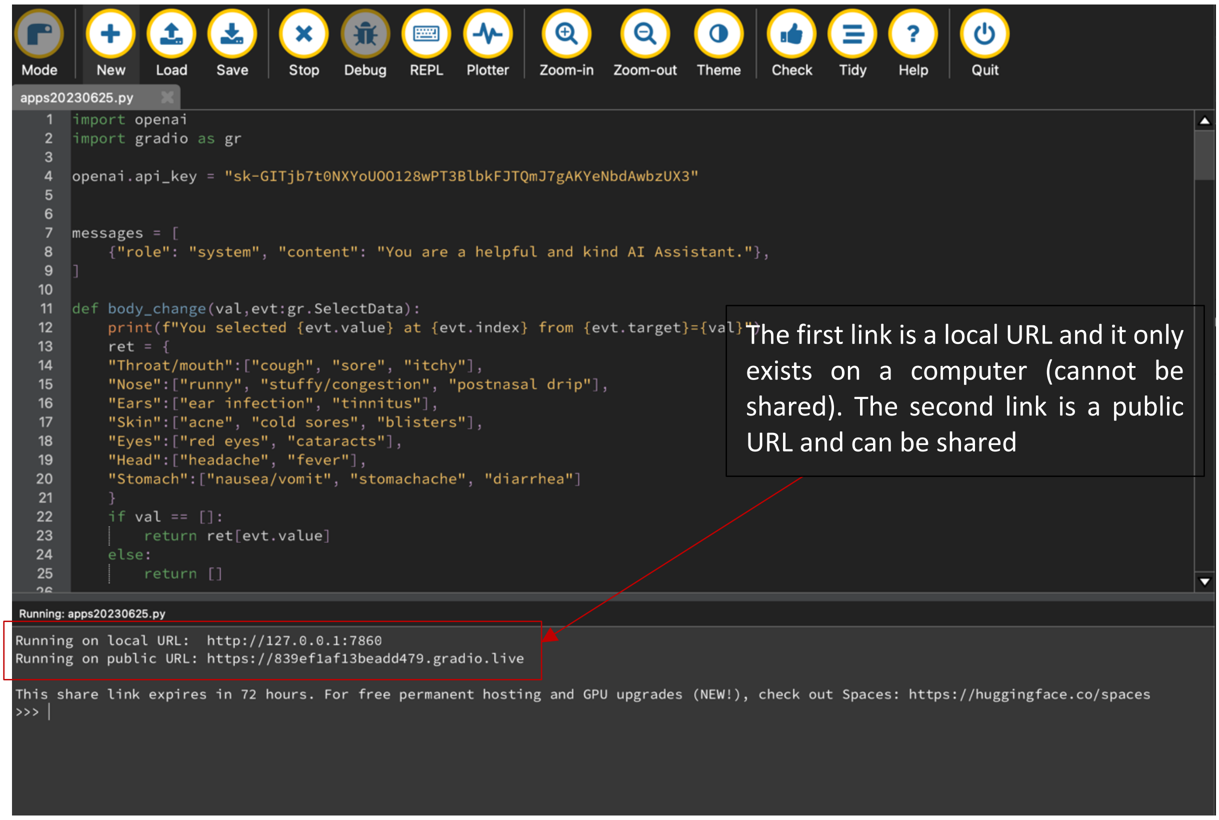
    ret = {
    "Throat/mouth":["cough", "sore", "itchy"],
    "Nose":["runny", "stuffy/congestion", "postnasal drip"],
    "Ears":["ear infection", "tinnitus"],
    "Skin":["acne", "cold sores", "blisters"],
    "Eyes":["red eyes", "cataracts"],
    "Head":["headache", "fever"],
    "Stomach":["nausea/vomit", "stomachache", "diarrhea"]
    }
    if val == []:
        return ret[evt.value]
    else:
        return []

def chatbot(
    body1,
    chk1,
    body2,
    chk2,
    body3,
    chk3,
    body4,
    chk4,
    body5,
    chk5,
```

Step 2: Hosting the AI web app



```
import openai
import gradio as gr

openai.api_key = "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"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def body_change(val,evt:gr.SelectData):
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    ret = {
    "Throat/mouth":["cough", "sore", "itchy"],
    "Nose":["runny", "stuffy/congestion", "postnasal drip"],
    "Ears":["ear infection", "tinnitus"],
    "Skin":["acne", "cold sores", "blisters"],
    "Eyes":["red eyes", "cataracts"],
    "Head":["headache", "fever"],
    "Stomach":["nausea/vomit", "stomachache", "diarrhea"]
    }
    if val == []:
        return ret[evt.value]
    else:
        return []
```

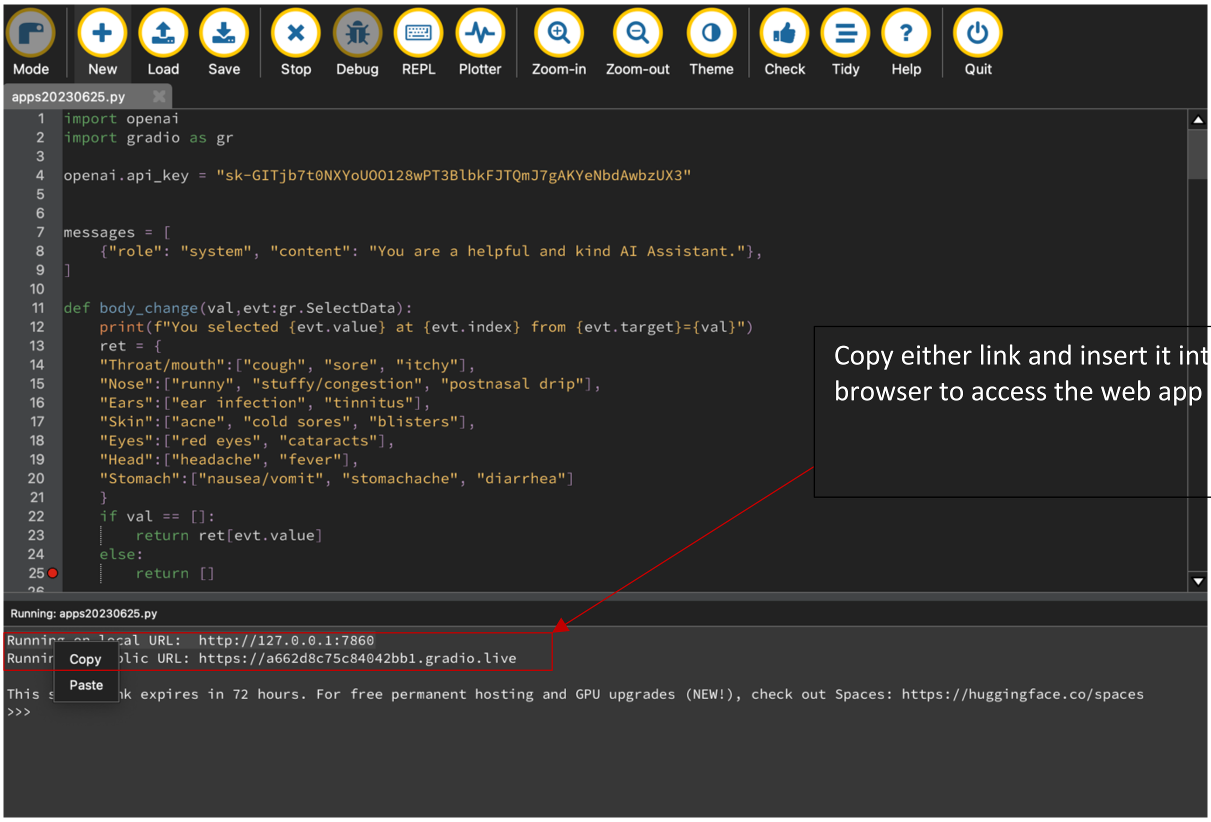
The first link is a local URL and it only exists on a computer (cannot be shared). The second link is a public URL and can be shared

Running: apps20230625.py

```
Running on local URL:  http://127.0.0.1:7860
Running on public URL: https://839ef1af13beadd479.gradio.live

This share link expires in 72 hours. For free permanent hosting and GPU upgrades (NEW!), check out Spaces: https://huggingface.co/spaces
>>> 
```

Step 3: Access the link



```
import openai
import gradio as gr

openai.api_key = "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"


messages = [
    {"role": "system", "content": "You are a helpful and kind AI Assistant."},
]

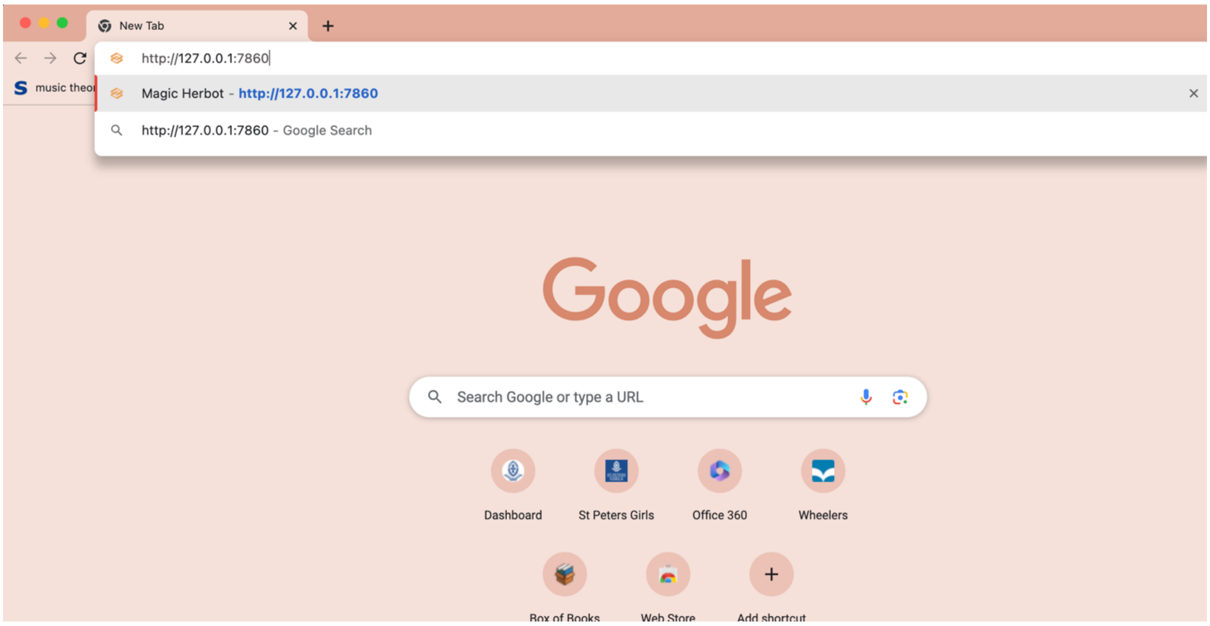
def body_change(val,evt:gr.SelectData):
    print(f"You selected {evt.value} at {evt.index} from {evt.target}={val}")
    ret = {
    "Throat/mouth":["cough", "sore", "itchy"],
    "Nose":["runny", "stuffy/congestion", "postnasal drip"],
    "Ears":["ear infection", "tinnitus"],
    "Skin":["acne", "cold sores", "blisters"],
    "Eyes":["red eyes", "cataracts"],
    "Head":["headache", "fever"],
    "Stomach":["nausea/vomit", "stomachache", "diarrhea"]
    }
    if val == []:
        return ret[evt.value]
    else:
        return []
```

Running: apps20230625.py

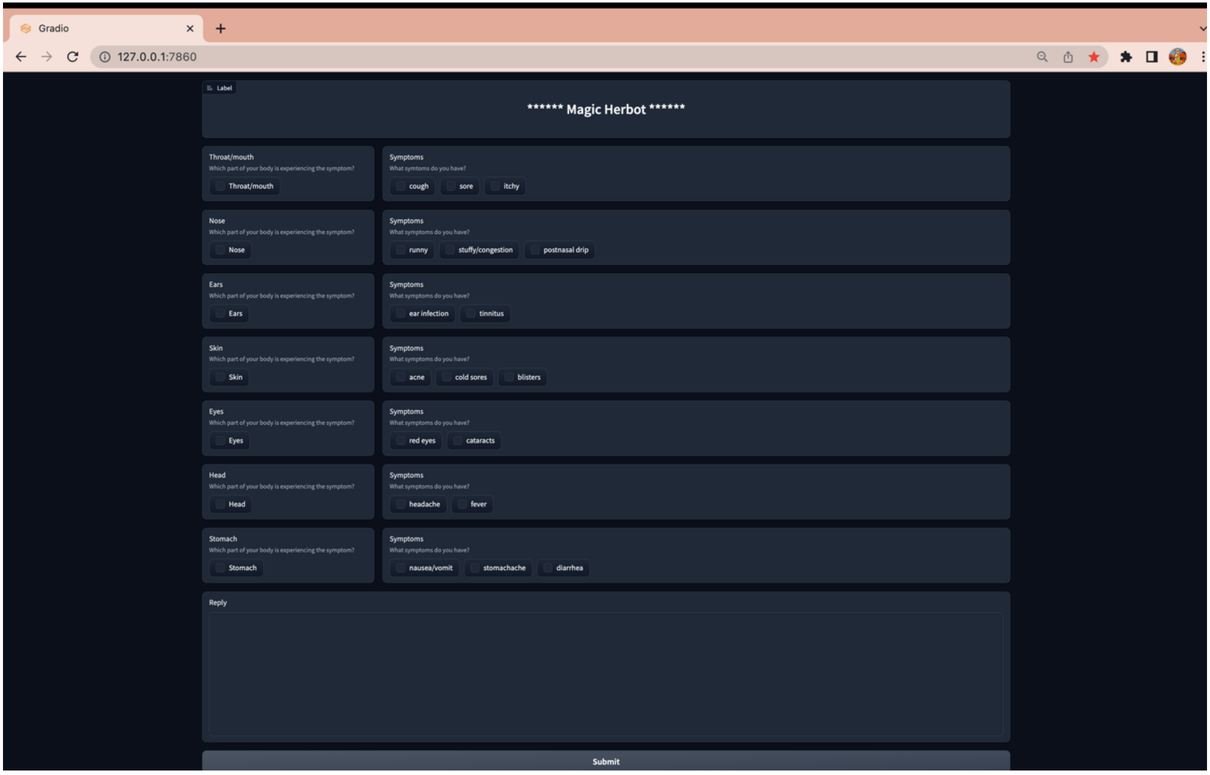
```
Running on local URL:  http://127.0.0.1:7860
Runnir      blic URL: https://a662d8c75c84042bb1.gradio.live

This s      nk expires in 72 hours. For free permanent hosting and GPU upgrades (NEW!), check out Spaces: https://huggingface.co/spaces
>>>
```

Copy either link and insert it int
browser to access the web app



Step 4: Launch the web app



****** Magic Herbot ******

Throat/mouth
Which part of your body is experiencing the symptom?
☐ Throat/mouth

Symptoms
What symtoms do you have?
☐ cough ☐ sore ☐ itchy

Nose
Which part of your body is experiencing the symptom?
☐ Nose

Symptoms
What symptoms do you have?
☐ runny ☐ stuffy/congestion ☐ postnasal drip

Ears
Which part of your body is experiencing the symptom?
☐ Ears

Symptoms
What symptoms do you have?
☐ ear infection ☐ tinnitus

Skin
Which part of your body is experiencing the symptom?
☐ Skin

Symptoms
What symptoms do you have?
☐ acne ☐ cold sores ☐ blisters

Eyes
Which part of your body is experiencing the symptom?
☐ Eyes

Symptoms
What symptoms do you have?
☐ red eyes ☐ cataracts

Head
Which part of your body is experiencing the symptom?
☐ Head

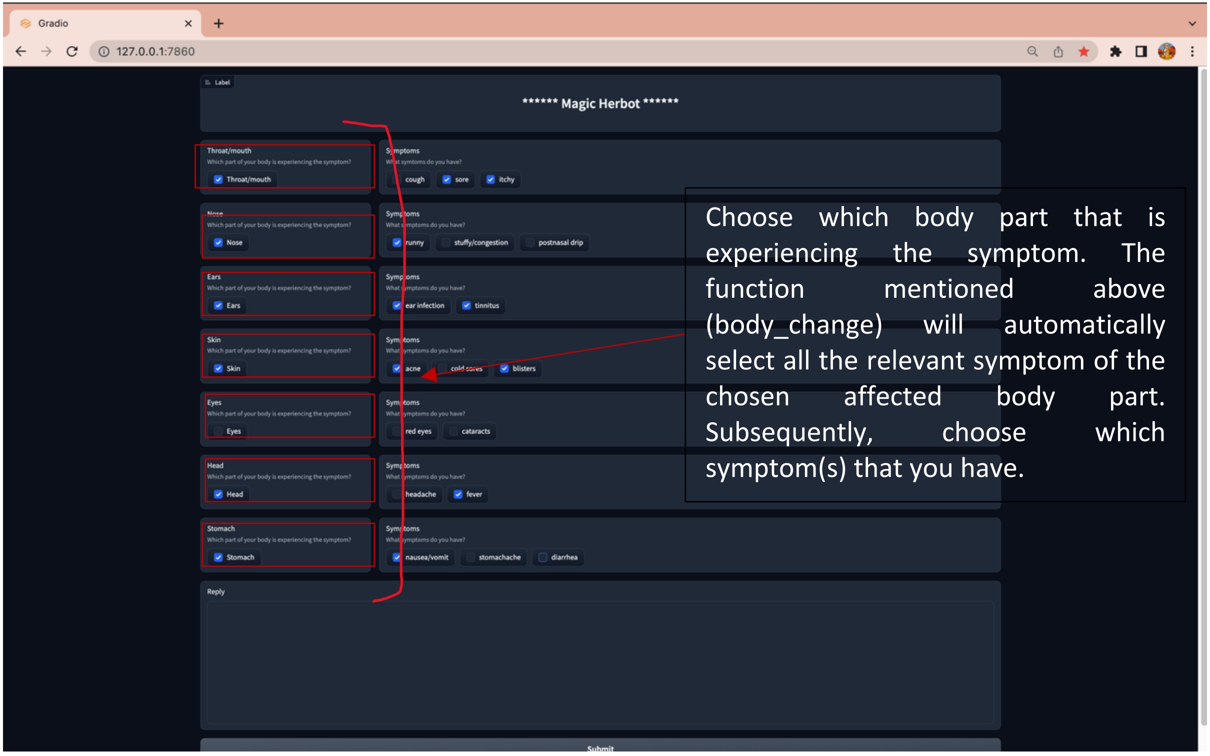
Symptoms
What symptoms do you have?
☐ headache ☐ fever

Stomach
Which part of your body is experiencing the symptom?
☐ Stomach

Symptoms
What symptoms do you have?
☐ nausea/vomit ☐ stomachache ☐ diarrhea

Reply

Step 5: Select Checkbox – select body part that is experiencing the symptom



****** Magic Herbot ******

Throat/mouth
Which part of your body is experiencing the symptom?
☑ Throat/mouth

Symptoms
What symtoms do you have?
☐ cough ☑ sore ☑ itchy

Nose
Which part of your body is experiencing the symptom?
☑ Nose

Symptoms
What symptoms do you have?
☑ runny ☐ stuffy/congestion ☐ postnasal drip

Ears
Which part of your body is experiencing the symptom?
☑ Ears

Symptoms
What symptoms do you have?
☑ ear infection ☑ tinnitus

Skin
Which part of your body is experiencing the symptom?
☑ Skin

Symptoms
What symptoms do you have?
☑ acne ☐ cold sores ☑ blisters

Eyes
Which part of your body is experiencing the symptom?
☐ Eyes

Symptoms
What symptoms do you have?
☐ red eyes ☐ cataracts

Head
Which part of your body is experiencing the symptom?
☑ Head

Symptoms
What symptoms do you have?
☐ headache ☑ fever

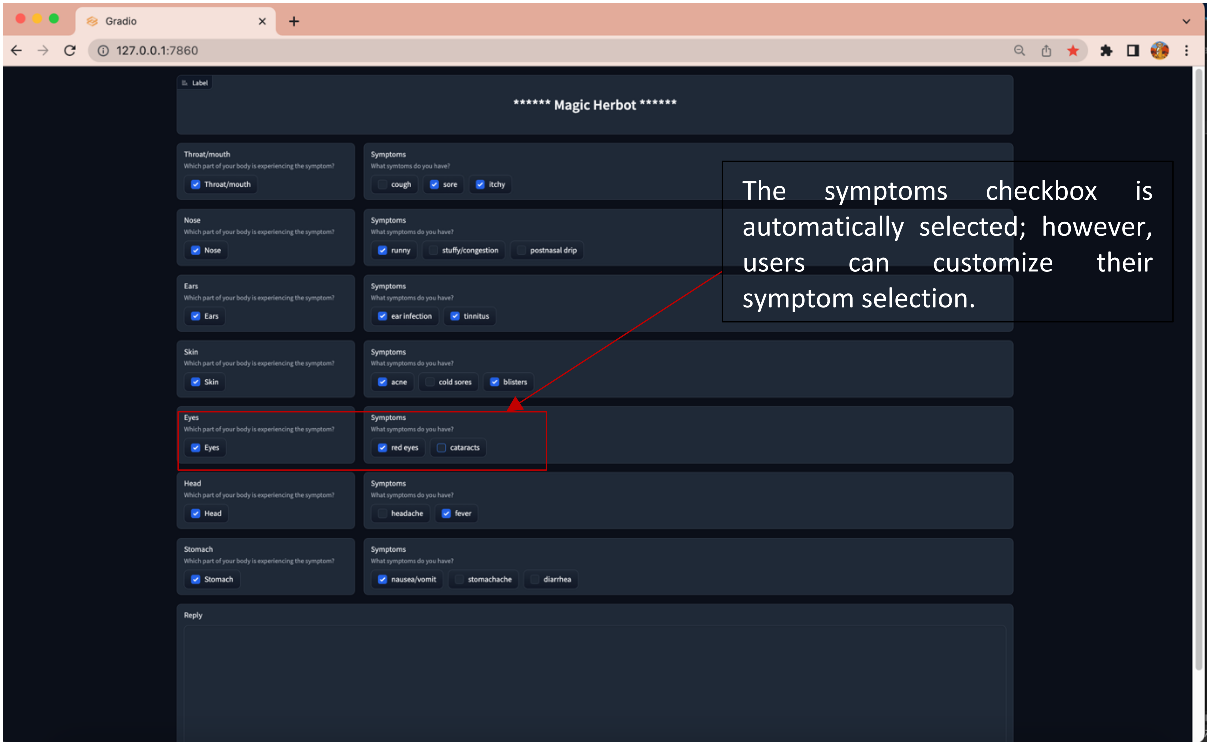
Stomach
Which part of your body is experiencing the symptom?
☑ Stomach

Symptoms
What symptoms do you have?
☑ nausea/vomit ☐ stomachache ☐ diarrhea

Reply

Choose which body part that is experiencing the symptom. The function mentioned above (body_change) will automatically select all the relevant symptom of the chosen affected body part. Subsequently, choose which symptom(s) that you have.

Select checkbox—choose corresponding symptoms



****** Magic Herbot ******

Throat/mouth
Which part of your body is experiencing the symptom?
☑ Throat/mouth

Symptoms
What symtoms do you have?
☐ cough ☑ sore ☑ itchy

Nose
Which part of your body is experiencing the symptom?
☑ Nose

Symptoms
What symptoms do you have?
☑ runny ☐ stuffy/congestion ☐ postnasal drip

Ears
Which part of your body is experiencing the symptom?
☑ Ears

Symptoms
What symptoms do you have?
☑ ear infection ☑ tinnitus

Skin
Which part of your body is experiencing the symptom?
☑ Skin

Symptoms
What symptoms do you have?
☑ acne ☐ cold sores ☑ blisters

Eyes
Which part of your body is experiencing the symptom?
☑ Eyes

Symptoms
What symptoms do you have?
☑ red eyes ☐ cataracts

Head
Which part of your body is experiencing the symptom?
☑ Head

Symptoms
What symptoms do you have?
☐ headache ☑ fever

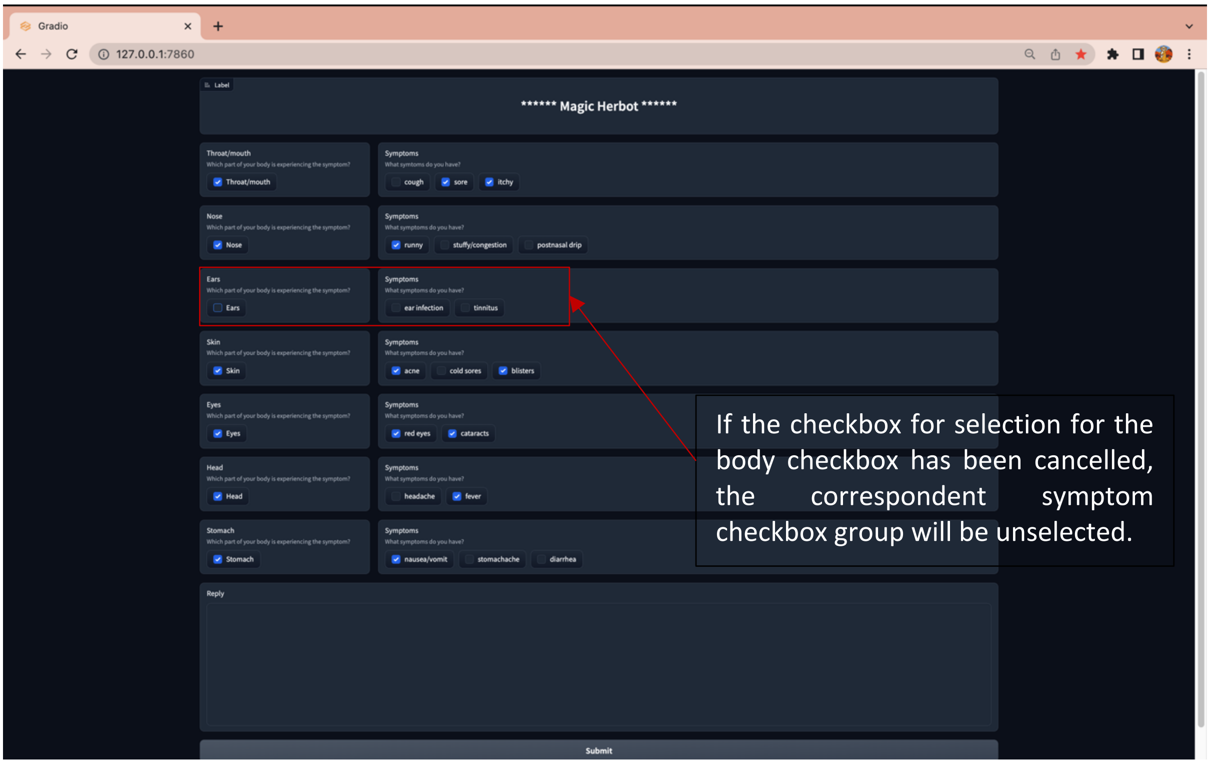
Stomach
Which part of your body is experiencing the symptom?
☑ Stomach

Symptoms
What symptoms do you have?
☑ nausea/vomit ☐ stomachache ☐ diarrhea

Reply

The symptoms checkbox is automatically selected; however, users can customize their symptom selection.

Cancel selection of checkbox



****** Magic Herbot ******

Throat/mouth
Which part of your body is experiencing the symptom?
☑ Throat/mouth

Symptoms
What symtoms do you have?
☐ cough ☑ sore ☑ itchy

Nose
Which part of your body is experiencing the symptom?
☑ Nose

Symptoms
What symptoms do you have?
☑ runny ☐ stuffy/congestion ☐ postnasal drip

Ears
Which part of your body is experiencing the symptom?
☐ Ears

Symptoms
What symptoms do you have?
☐ ear infection ☐ tinnitus

Skin
Which part of your body is experiencing the symptom?
☑ Skin

Symptoms
What symptoms do you have?
☑ acne ☐ cold sores ☑ blisters

Eyes
Which part of your body is experiencing the symptom?
☑ Eyes

Symptoms
What symptoms do you have?
☑ red eyes ☑ cataracts

Head
Which part of your body is experiencing the symptom?
☑ Head

Symptoms
What symptoms do you have?
☐ headache ☑ fever

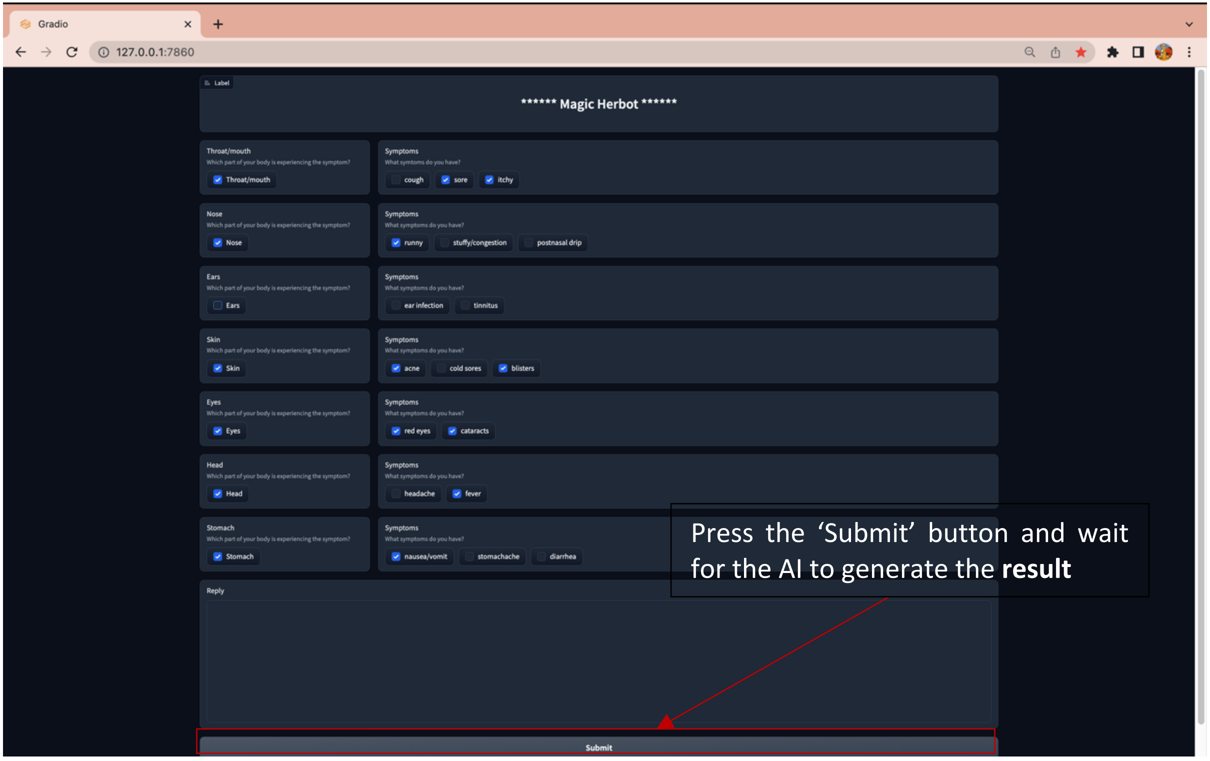
Stomach
Which part of your body is experiencing the symptom?
☑ Stomach

Symptoms
What symptoms do you have?
☑ nausea/vomit ☐ stomachache ☐ diarrhea

Reply

If the checkbox for selection for the body checkbox has been cancelled, the correspondent symptom checkbox group will be unselected.

Step 6: Press the ‘Submit’ button and wait for the AI to generate the result



****** Magic Herbot ******

Throat/mouth
Which part of your body is experiencing the symptom?
☑ Throat/mouth

Symptoms
What symtoms do you have?
□ cough ☑ sore ☑ itchy

Nose
Which part of your body is experiencing the symptom?
☑ Nose

Symptoms
What symptoms do you have?
☑ runny □ stuffy/congestion □ postnasal drip

Ears
Which part of your body is experiencing the symptom?
□ Ears

Symptoms
What symptoms do you have?
□ ear infection □ tinnitus

Skin
Which part of your body is experiencing the symptom?
☑ Skin

Symptoms
What symptoms do you have?
☑ acne □ cold sores ☑ blisters

Eyes
Which part of your body is experiencing the symptom?
☑ Eyes

Symptoms
What symptoms do you have?
☑ red eyes ☑ cataracts

Head
Which part of your body is experiencing the symptom?
☑ Head

Symptoms
What symptoms do you have?
□ headache ☑ fever

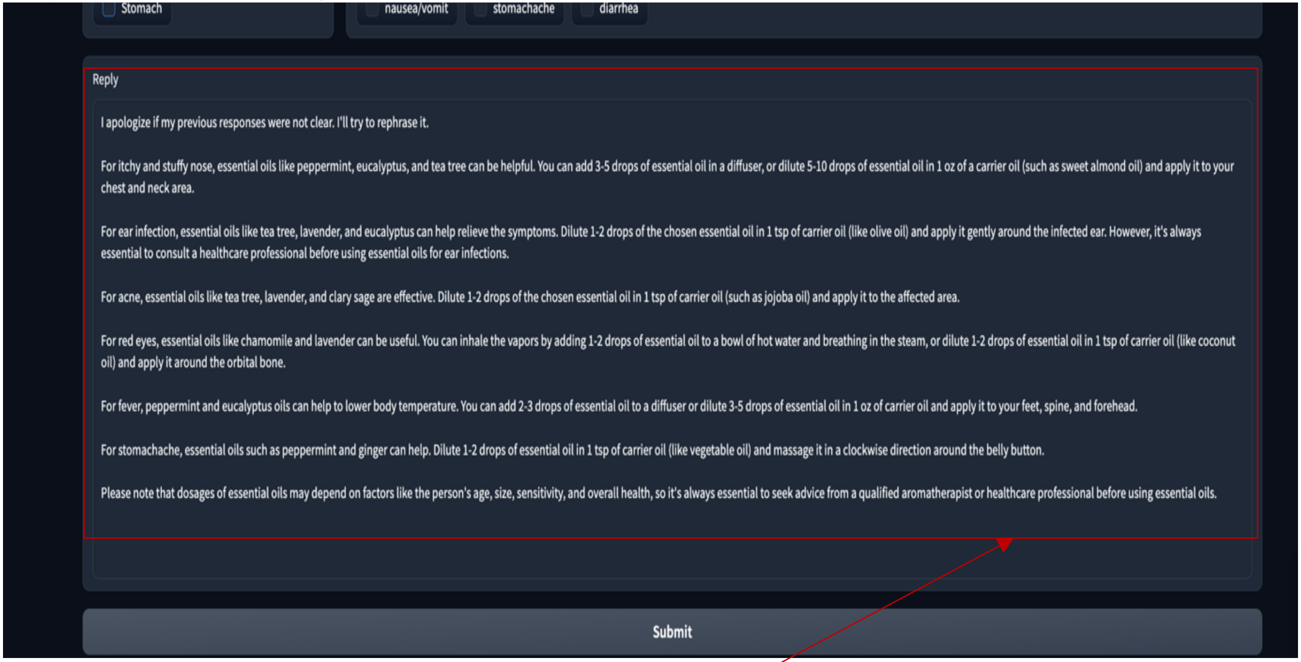
Stomach
Which part of your body is experiencing the symptom?
☑ Stomach

Symptoms
What symptoms do you have?
☑ nausea/vomit □ stomachache □ diarrhea

Reply

Press the ‘Submit’ button and wait for the AI to generate the **result**

Step 7: The response is generated



Reply

I apologize if my previous responses were not clear. I'll try to rephrase it.

For itchy and stuffy nose, essential oils like peppermint, eucalyptus, and tea tree can be helpful. You can add 3-5 drops of essential oil in a diffuser, or dilute 5-10 drops of essential oil in 1 oz of a carrier oil (such as sweet almond oil) and apply it to your chest and neck area.

For ear infection, essential oils like tea tree, lavender, and eucalyptus can help relieve the symptoms. Dilute 1-2 drops of the chosen essential oil in 1 tsp of carrier oil (like olive oil) and apply it gently around the infected ear. However, it's always essential to consult a healthcare professional before using essential oils for ear infections.

For acne, essential oils like tea tree, lavender, and clary sage are effective. Dilute 1-2 drops of the chosen essential oil in 1 tsp of carrier oil (such as jojoba oil) and apply it to the affected area.

For red eyes, essential oils like chamomile and lavender can be useful. You can inhale the vapors by adding 1-2 drops of essential oil to a bowl of hot water and breathing in the steam, or dilute 1-2 drops of essential oil in 1 tsp of carrier oil (like coconut oil) and apply it around the orbital bone.

For fever, peppermint and eucalyptus oils can help to lower body temperature. You can add 2-3 drops of essential oil to a diffuser or dilute 3-5 drops of essential oil in 1 oz of carrier oil and apply it to your feet, spine, and forehead.

For stomachache, essential oils such as peppermint and ginger can help. Dilute 1-2 drops of essential oil in 1 tsp of carrier oil (like vegetable oil) and massage it in a clockwise direction around the belly button.

Please note that dosages of essential oils may depend on factors like the person's age, size, sensitivity, and overall health, so it's always essential to seek advice from a qualified aromatherapist or healthcare professional before using essential oils.

4.1. Applications

Magic Herbot has potential applications for providing diagnosis and medication to patients and making a decision about what a certain sickness is if they are living in a remote area or young children/old people do not need to wait a long time in a clinic or hospital for diagnosis. Magic Herbot can be used to prevent sicknesses from getting severe. Once sickness is detected, the patient takes action swiftly to prevent it from getting worse. Another potential application is to combine 'online shopping' and Magic Herbot. When the web application gives medical advice, the patients can order herbal medicine to be delivered to them. The patients with mild symptoms may want to use it because the web application is easily accessible.

The layout of the checkboxes is simple and users can easily interpret how to use it. On each of the checkboxes, some headings label what the checkboxes are for. For example, the label of 'cough' is 'Symptoms' and the description is 'What symptoms do you have?'. The patients would know what the checkbox cough is for and therefore would know what to check. However, the aesthetics are not as appealing as the background colour is only light/dark (depending on day or night) and there are no decorative borders.

4.2. Areas of Improvement

While developing Magic Herbot, my first attempt was to create my own database comprising symptoms, diseases and medication to incorporate them to "train" AI. However, due to my limited time and knowledge, it was too complicated and required massive data. Hence, the current version of Magic Herbot makes use of Openai with a variety of sources to generate results.

In view of the above, the data from Openai are unable to be verified. Hence, sometimes, it crashes. The current version of Magic Herbot has limited user input by only allowing the user to select checkboxes. However, if the Wi-Fi environment blocks Openai, the code will encounter errors as it needs Openai for generating responses. The AI's responses are sometimes unreliable, so I plan to improve its accuracy by providing more training to help it understand its tasks better. Additionally, the AI can be unclear about dosage, assuming that a few drops are an accurate measurement, which is not the case. Therefore, I intend to clarify to the AI what an approximate dosage is. Additionally, I could add more options and branches to broaden the input. The science is mostly accurate but sometimes, classifications such as whether fever belongs to the body part 'head' is unclear. If the AI cannot find any data on recommended dosages, it fills in gaps with unspecific information or information that is unreliable.

Since the sources of Openai's data is unknown, sometimes the information can be untrustworthy. This can be improved by creating my own database so the AI can follow it logically and the information is dependable. Additional abilities can be added to the web application, such as diagnosing and predicting sicknesses. People with disabilities might not be able to use the web app and this can be improved by making it more user-friendly. This can be done by adding audio functions and images to make Magic Herbot look more humanlike and intelligent.

5. Conclusion

My Science idea to develop a web application, Magic Herbot is very effective. Magic Herbot powered by AI is able to give medical advice information to people with common ailments. I will further improve Magic Herbot to make it more robust and user-friendly.

6. Reference List

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7. Acknowledgement

Sophie Dolling- Scientist in Residence

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Lania Chan -Mother

Appendix A

Programme of Magic Herbot

```
import openai
import gradio as gr

openai.api_key = "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"


messages = [
    {"role": "system", "content": "You are a helpful and kind AI Assistant."},
]

def body_change(val,evt:gr.SelectData):
    print(f"You selected {evt.value} at {evt.index} from {evt.target}={val}")
    ret = {
    "Throat/mouth":["cough", "sore", "itchy"],
    "Nose":["runny", "stuffy/congestion", "postnasal drip"],
    "Ears":["ear infection", "tinnitus"],
    "Skin":["acne", "cold sores", "blisters"],
    "Eyes":["red eyes", "cataracts"],
    "Head":["headache", "fever"],
    "Stomach":["nausea/vomit", "stomachache", "diarrhea"]
    }
    if val == []:
        return ret[evt.value]
    else:
        return []

def chatbot(
    body1,
    chk1,
    body2,
    chk2,
    body3,
    chk3,
    body4,
    chk4,
    body5,
    chk5,
    body6,
    chk6,
    body7,
    chk7,
):
    input_text = ""
    mouth_input = ""
    nose_input = ""
    ears_input = ""
    skin_input = ""
    eyes_input = ""
    head_input = ""
    stom_input = ""

    for i in chk1:
        mouth_input = mouth_input + i + " "
    for j in chk2:
        nose_input = nose_input + j + " "
    for t in chk3:
        ears_input = ears_input + t + " "
    for p in chk4:
        skin_input = skin_input + p + " "
    for k in chk5:
        eyes_input = eyes_input + k + " "
    for h in chk6:
        head_input = head_input + h + " "
    for b in chk7:
        stom_input = stom_input + b + " "

    input_text = (
        mouth_input
        + nose_input
        + ears_input
        + skin_input
        + eyes_input
        + head_input
        + stom_input
    )
    print(input_text)

    messages.append({"role": "user", "content": "What essential oil for" + input_text})
    messages.append({"role": "user", "content": "How much dosage of essential oil for this
symptom" + input_text})
    chat = openai.ChatCompletion.create(model="gpt-3.5-turbo", messages=messages)
    reply = chat.choices[0].message.content
    messages.append({"role": "assistant", "content": reply})
    return reply

with gr.Blocks() as demo:
    #gr.Markdown("AI Chatbot")
    gr.Label(value="****** Magic Herbot ******")
    with gr.Row():
        with gr.Column(scale=3):
            body1 = gr.CheckboxGroup(
                ["Throat/mouth"],
                value=[],
                label="Throat/mouth",
                info="Which part of your body is experiencing the symptom?",
            )
        with gr.Column(scale=15):
            chk1 = gr.CheckboxGroup(
                ["cough", "sore", "itchy"],
                value=[],
                label="Symptoms",
                info="What symtoms do you have?",
            )
    with gr.Row():
        with gr.Column(scale=3):
            body2 = gr.CheckboxGroup(
                ["Nose"],
                value=[],
                label="Nose",
                info="Which part of your body is experiencing the symptom?",
            )
        with gr.Column(scale=15):
            chk2 = gr.CheckboxGroup(
                ["runny", "stuffy/congestion", "postnasal drip"],
                value=[],
                label="Symptoms",
                info="What symptoms do you have?",
            )
    with gr.Row():
        with gr.Column(scale=3):
            body3 = gr.CheckboxGroup(
                ["Ears"],
                value=[],
                label="Ears",
                info="Which part of your body is experiencing the symptom?",
            )
        with gr.Column(scale=15):
            chk3 = gr.CheckboxGroup(
                ["ear infection", "tinnitus"],
                value=[],
                label="Symptoms",
                info="What symptoms do you have?",
            )
    with gr.Row():
        with gr.Column(scale=3):
            body4 = gr.CheckboxGroup(
                ["Skin"],
                value=[],
                label="Skin",
                info="Which part of your body is experiencing the symptom?",
            )
        with gr.Column(scale=15):
            chk4 = gr.CheckboxGroup(
                ["acne", "cold sores", "blisters"],
                value=[],
                label="Symptoms",
                info="What symptoms do you have?",
            )
    with gr.Row():
        with gr.Column(scale=3):
            body5 = gr.CheckboxGroup(
                ["Eyes"],
                value=[],
                label="Eyes",
                info="Which part of your body is experiencing the symptom?",
            )
        with gr.Column(scale=15):
            chk5 = gr.CheckboxGroup(
                ["red eyes", "cataracts"],
                value=[],
                label="Symptoms",
                info="What symptoms do you have?",
            )
    with gr.Row():
        with gr.Column(scale=3):
            body6 = gr.CheckboxGroup(
                ["Head"],
                value=[],
                label="Head",
                info="Which part of your body is experiencing the symptom?",
            )
        with gr.Column(scale=15):
            chk6 = gr.CheckboxGroup(
                ["headache", "fever"],
                value=[],
                label="Symptoms",
                info="What symptoms do you have?",
            )
    with gr.Row():
        with gr.Column(scale=3):
            body7 = gr.CheckboxGroup(
                ["Stomach"],
                value=[],
                label="Stomach",
                info="Which part of your body is experiencing the symptom?",
            )
        with gr.Column(scale=15):
            chk7 = gr.CheckboxGroup(
                    ["nausea/vomit", "stomachache", "diarrhea"],
                    value=[],
                    label="Symptoms",
                    info="What symptoms do you have?",
                )
        with gr.Row():
            outputs = gr.Textbox(label="Reply",lines=10)
        with gr.Row():
            submit = gr.Button("Submit")
        inputs = [
        body1,
        chk1,
        body2,
        chk2,
        body3,
        chk3,
        body4,
        chk4,
        body5,
        chk5,
        body6,
        chk6,
        body7,
        chk7,]
        submit.click(chatbot,inputs,outputs);
        body1.select(body_change, body1, chk1)
        body2.select(body_change, body2, chk2)
        body3.select(body_change, body3, chk3)
        body4.select(body_change, body4, chk4)
        body5.select(body_change, body5, chk5)
        body6.select(body_change, body6, chk6)
        body7.select(body_change, body7, chk7)

    demo.launch(share=True)
```