COMP-4400 Final Project Documentation

Project Title: Covid-19 Chatbot Using Prolog
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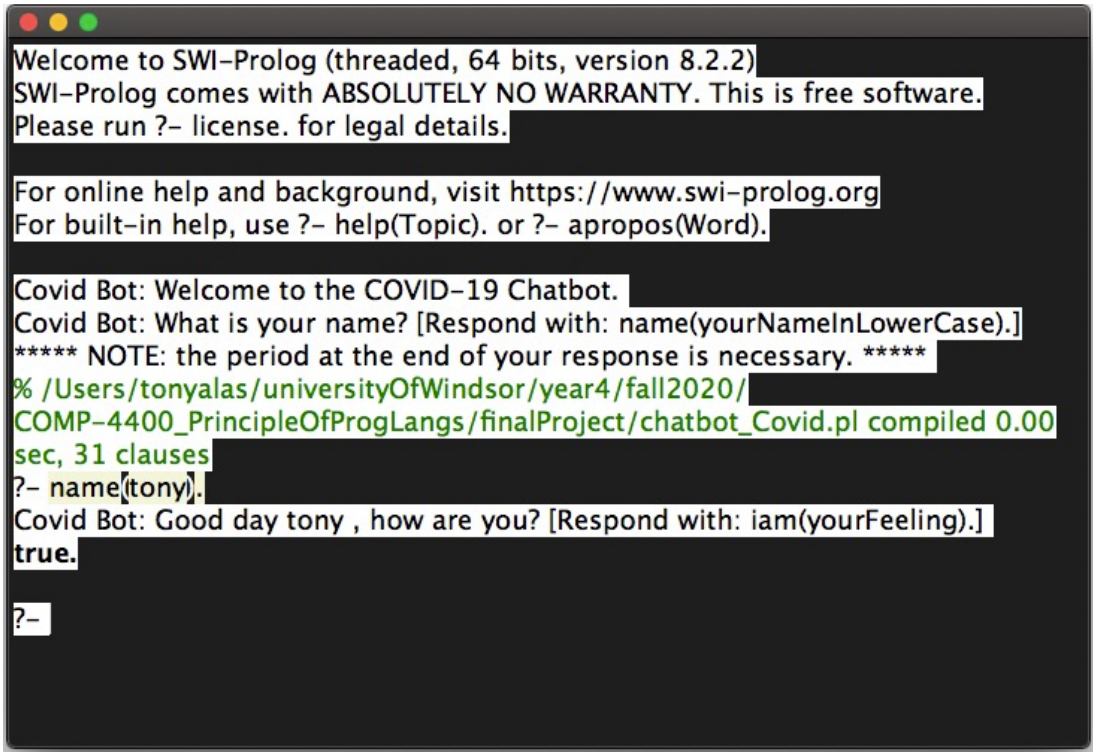
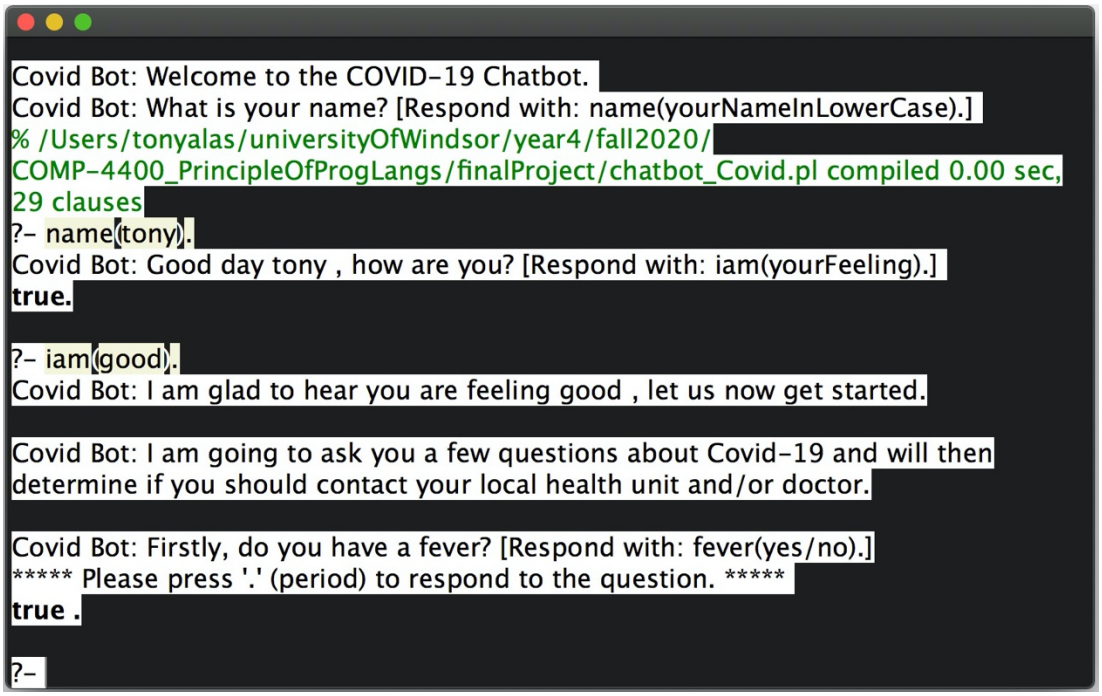
Documentation:
This project consists of a Prolog program which was written with SWI-Prolog in mind. It runs best when consulting the program from within SWI-Prolog. You will then see the first prompt from the Covid Bot which will allow you to respond with your name.
ALL responses will be in the form of a procedure call (which the program will let you know), so for example:
The first question will be "what is your name?"
The user should respond with:
name(yourName). -> Sample Run: name(tony). (where the period is necessary).
Therefore, any response to a question will need to be of the form:
procName(yourResponse).

Here is what you should see on the initial program run after entering your name:

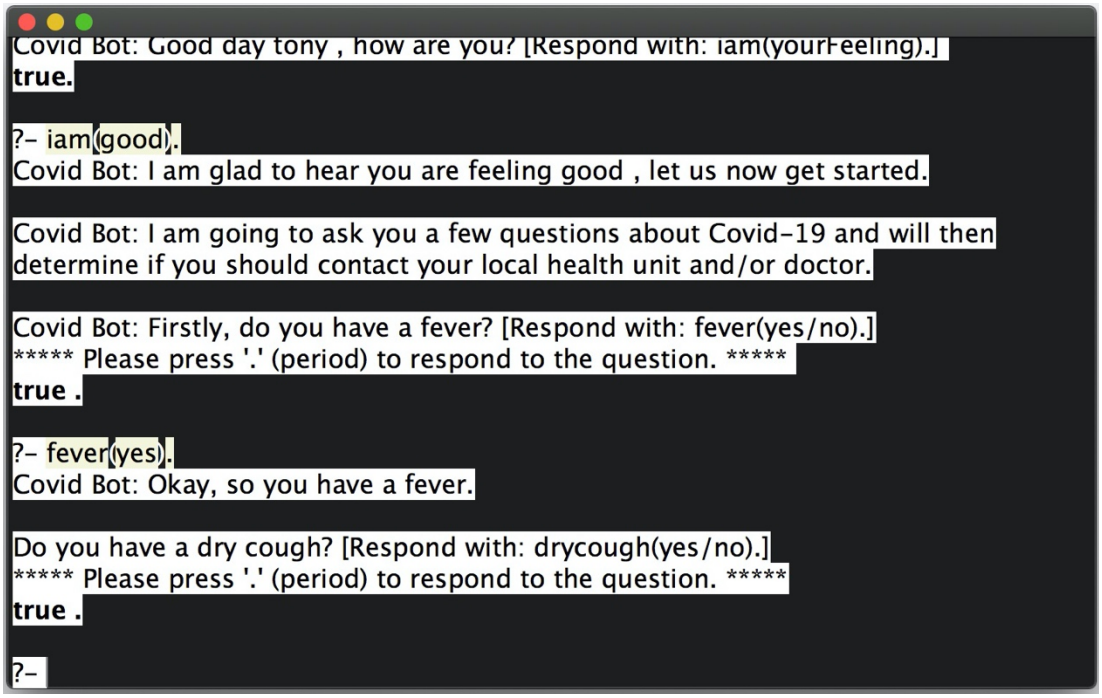


Additionally, whenever the Covid Bot asks a question and when the user responds with a "yes" to any of the questions, the user will need to press the '.' (period) key in order to be able to

respond. This is due to the fact that the procedure will try to return any remaining searches, but the period will allow the user to skip said search. Two examples are shown below:



For this part of the program, you can see that the program tells the user that they need to press the period key in order to continue to respond. You can also see that the first message from the Covid Bot in response to the “iam(yourFeeling)” call returns a specific response depending on what the user said. For example, if the user responded with something like “sad” or “bad”, then the bot will output a different message.



For this portion of the program, **as well as the rest of the program when the user responds with "yes" to one of the questions**, the bot will output a message or two and then ask the next question. The user will then be prompted to tell them that they need to press the period key in order to be able to respond to the question.

Therefore, the program will output slightly different messages depending on whether or not the user responds with a "yes" or "no" to make it feel more personalized.

There are many procedures in the program for each question that is asked. The input will be the response from the previous question and the output will be a series of messages reacting to the response, as well as asking the next question. More specifically, the procedures will take in a previous response and then output a slightly different response based on if the user said yes or no, and then will ask them the next question. If the user answers yes, the counter variable will increase (by calling the add procedure). The procedures that follow this description include fever, drycough, tired, breath, chestpain, speech, sorethroat, aches, rash, taste. Each of these are formatted in the form: proc(X) where X is the response from the user.

The program will also keep a count of the amount of times that the user responds with "yes" to a question. There are a few procedures that handle this information, namely: add, addtwo, counterValue(), checkCounter(X), intermediateFunc(X). These functions make use of the native Prolog nb_getval and nb_setval procedures that originally set the counter to 0 at the beginning of the program and then increase the counter whenever the user responses with "yes". For most of the questions, if the user responds with "yes", the counter will increase by one, but if

the counter will increase by 2 if the user responds with “yes” to any of the 3 serious symptoms (which are breath, chestpain and speech). This is to make up for the fact that they are more important and if somehow the user responds with “no” to most of the other questions, the bot will still recommend that they consult a medical professional or keep an eye on their health for further complications. This is because the threshold for the bot to respond with letting the user know that they do not need to worry yet is a score of 3 or below. Therefore, by making the serious symptoms increase the counter by 2, it will help prevent the bot from thinking that the user is safe.
If the user's score is below 4 (exclusive), it will go to the procedure that tells the user that they should be safe for now, if it is above 4 (inclusive) then it will go to an intermediate procedure that will do another comparison. If the user's score is below 7 (exclusive), it will go to the procedure that tells the user that they are okay for now but should be wary, if it is above 7 (inclusive) then it will tell them to report to a doctor, etc.
Therefore, depending on the user’s final score, the bot will provide different responses and decide whether or not the user needs to keep an eye on their health, contact a medical professional immediately, or can relax for now. The bot will output a series of links, resources and more information if the user gets either of the two outcomes that do not say they can relax. However, if the user wants the information even if they do not need to worry, they can call the procedure “covidInfo.” to output the same information regardless.

The program will also give the user the option to take the test again by calling the procedure “takeAgain.” which will reset the total score and bring them back to the beginning.

Below is a sample run of the entire program where the user only answers “yes” **twice**:

```
Covid Bot: Welcome to the COVID-19 Chatbot.
Covid Bot: What is your name? [Respond with: name(yourNameInLowerCase).]
***** NOTE: the period at the end of your response is necessary. *****
% /Users/tonyalas/universityOfWindsor/year4/fall2020/COMP-4400_PrincipleOfProgLangs/finalProject/
chatbot_Covid.pl compiled 0.00 sec, 31 clauses
?- name(abed).
Covid Bot: Good day abed , how are you? [Respond with: iam(yourFeeling).]
true.

?- iam(good).
Covid Bot: I am glad to hear you are feeling good , let us now get started.

Covid Bot: I am going to ask you a few questions about Covid-19 and will then determine if you should
contact your local health unit and/or doctor.

Covid Bot: Firstly, do you have a fever? [Respond with: fever(yes/no).]
***** Please press '.' (period) to respond to the question. *****
true .

?- fever(no).
Covid Bot: Okay, so you do not have a fever. Noted. Next question.

Do you have a dry cough? [Respond with: drycough(yes/no).]
true.

?- drycough(yes).
Covid Bot: So you have a dry cough, another common symptom.

Are you feeling excessively tired? [Respond with: tired(yes/no).]
***** Please press '.' (period) to respond to the question. *****
true .

?- tired(yes).
Covid Bot: So you are feeling tired. Nothing too unusual but it can be a common symptom.

Now for the more serious symptoms.

Do you have difficulty breathing or have a shortness of breath? [Respond with: breath(yes/no).]
***** Please press '.' (period) to respond to the question. *****
true .

?- breath(no).
Covid Bot: That is very good to hear. Difficulty breathing is one of the first noticeable major symptoms so
you would have felt it by now.

Now, do you feel any intense chest pain or a sense of pressure on your chest? [Respond with: chestpain(yes/
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Now, do you feel any intense chest pain or a sense of pressure on your chest? [Respond with: chestpain(yes/no).]
true.

?- chestpain(no).
Covid Bot: Oh good! That is good to hear.

Have you found that you have a loss of speech or find it difficult to move? [Respond with: speech(yes/no).]
true.

?- speech(no).
Covid Bot: Right. Now onto some of the less common and minor symptoms that will help me determine your next course of action.

Do you have a sore throat that has persisted longer than normal? [Respond with: sorethroat(yes/no).]
true.

?- sorethroat(no).
Covid Bot: Good, good.

Have you felt aches and pains that seem unprovoked? [Respond with: aches(yes/no).]
true.

?- aches(no).
Covid Bot: That is a good sign. Just two more questions.

Have you gotten any rashes on your skin? [Respond with: rash(yes/no).]
true.

?- rash(no).
Covid Bot: Great! Okay, final question, thank you for being patient.

Have you noticed a distinct lack of taste or smell? Perhaps food does not taste like anything specific and maybe even tastes flavourless? [Respond with: taste(yes/no).]
true.

?- taste(no).
Covid Bot: What relief! A lack of taste would be very terrible.

Before finalizing your total score and giving my recommendation, I would like to remind you that I am only a chatbot and may make a mistake in judgement so please only take my recommendation as a minor assistance and do not hesitate on going to visit a doctor if you start to feel worse.

I will now show you your overall score and give my recommendations.

Your total score is: 2
Covid Bot: Based on your responses and overall result number, you do not need to worry about contacting

As can be seen, the Covid Bot asks a series of questions with the user responding in a specific manner and the bot will eventually output their final analysis and give its recommendation. The user then has the option to receive the information regardless of the bot's positive recommendation and they can also choose to retake the questions (not shown in the above picture but will be shown below).

Below is a sample run of the entire program where the user answers "yes" enough times to land in the medium range (some parts are left out since it is similar to the run above):

```
Covid Bot: Welcome to the COVID-19 Chatbot.
Covid Bot: What is your name? [Respond with: name(yourNameInLowerCase).]
***** NOTE: the period at the end of your response is necessary. *****
% /Users/tonyalas/universityOfWindsor/year4/fall2020/COMP-4400_PrincipleOfProgLangs/finalProject/
chatbot_Covid.pl compiled 0.00 sec, 31 clauses
?- name(tony).
Covid Bot: Good day tony , how are you? [Respond with: iam(yourFeeling).]
true.

?- iam(bad).
Covid Bot: Oh no, that is not good to hear.

Covid Bot: I am going to ask you a few questions about Covid-19 and will then determine if you should
contact your local health unit and/or doctor.

Covid Bot: Firstly, do you have a fever? [Respond with: fever(yes/no).]
true.

?- fever(yes).
Covid Bot: Okay, so you have a fever.

Do you have a dry cough? [Respond with: drycough(yes/no).]
***** Please press '.' (period) to respond to the question. *****
true .

?- drycough(yes).
Covid Bot: So you have a dry cough, another common symptom.

Are you feeling excessively tired? [Respond with: tired(yes/no).]
***** Please press '.' (period) to respond to the question. *****
true .

?- tired(yes).
Covid Bot: So you are feeling tired. Nothing too unusual but it can be a common symptom.

Now for the more serious symptoms.

Do you have difficulty breathing or have a shortness of breath? [Respond with: breath(yes/no).]
***** Please press '.' (period) to respond to the question. *****
true .

?- breath(yes).
Covid Bot: Okay, let me write that down. Difficulty breathing is often one of the first major symptons you will
feel.

Now, do you feel any intense chest pain or a sense of pressure on your chest? [Respond with: chestpain(yes/
no).]
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Your total score is: 5
Covid Bot: Based on your responses and overall result number, you have scored an average/medium result.
Therefore I would recommend that you are technically safe for now but to definitely keep a close watch on
your symptoms to see if they worsen or you start to develop more symptoms.

If you would like to read the information about Covid-19 and recieve the additional resources, please type:
covidInfo. and hit enter.
If you wish to take the questions again please type: takeAgain. and hit enter.
***** Please press '.' (period) to enter your response. *****
true .

?-
```

As can be seen, this result is slightly different than the first one where the user is safe. The bot recommends that the user is good for now but should keep a close eye on their health.

Below is a sample run of the entire program where the user answers “yes” enough times to land in the CRITICAL range (some parts are left out since it is similar to the first run above):

```
Covid Bot: What is your name? [Respond with: name(yourNameInLowerCase).]
***** NOTE: the period at the end of your response is necessary. *****
% /Users/tonyalas/universityOfWindsor/year4/fall2020/COMP-4400_PrincipleOfProgLangs/finalProject/
chatbot_Covid.pl compiled 0.00 sec, 31 clauses
?- name(tony).
Covid Bot: Good day tony , how are you? [Respond with: iam(yourFeeling).]
true.

?- iam(good).
Covid Bot: I am glad to hear you are feeling good , let us now get started.

Covid Bot: I am going to ask you a few questions about Covid-19 and will then determine if you should
contact your local health unit and/or doctor.

Covid Bot: Firstly, do you have a fever? [Respond with: fever(yes/no).]
***** Please press '.' (period) to respond to the question. *****
true .

?- fever(yes).
Covid Bot: Okay, so you have a fever.

Do you have a dry cough? [Respond with: drycough(yes/no).]
***** Please press '.' (period) to respond to the question. *****
true .

?- drycough(yes).
Covid Bot: So you have a dry cough, another common symptom.

Are you feeling excessively tired? [Respond with: tired(yes/no).]
***** Please press '.' (period) to respond to the question. *****
true .

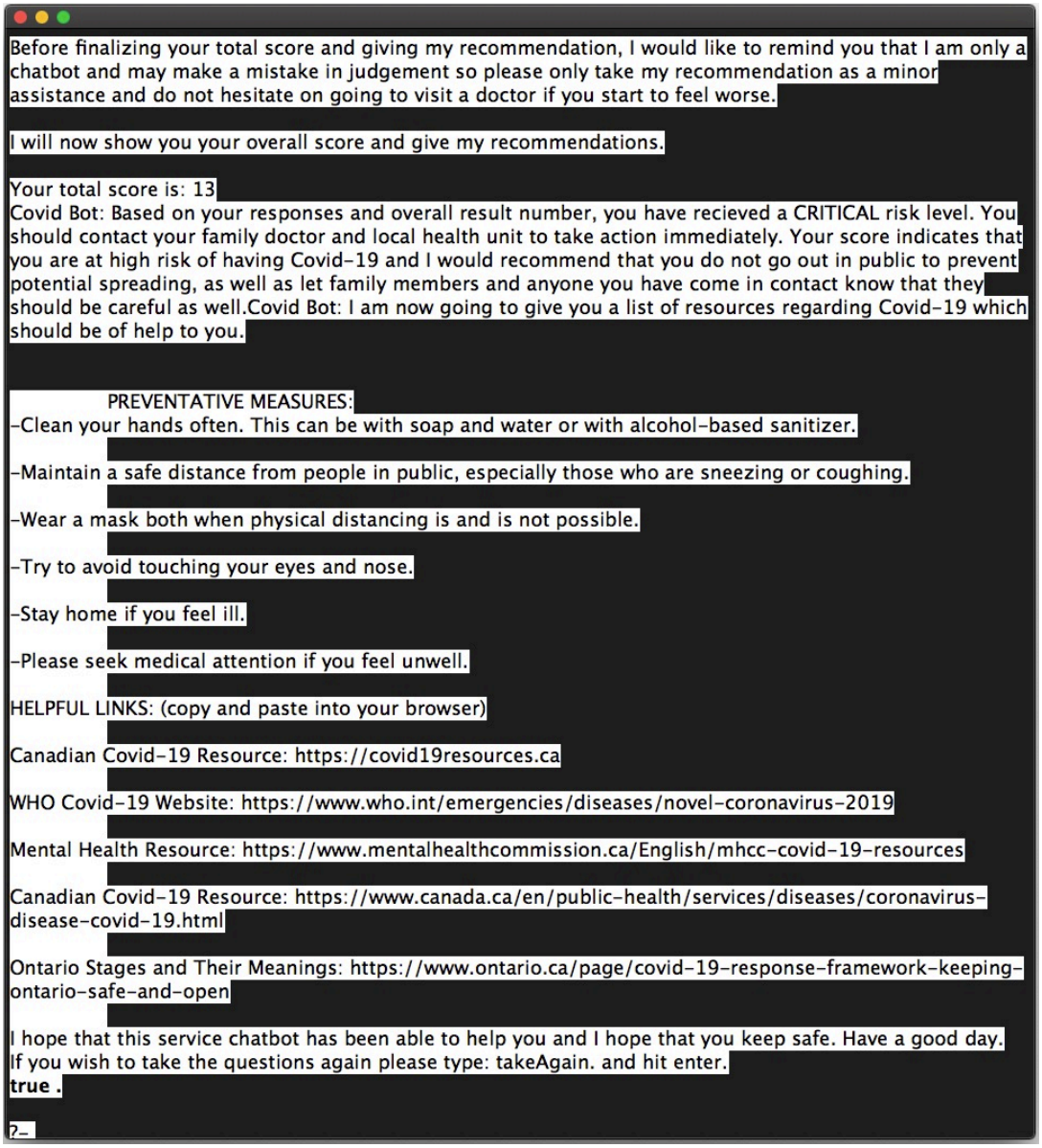
?- tired(yes).
Covid Bot: So you are feeling tired. Nothing too unusual but it can be a common symptom.

Now for the more serious symptoms.

Do you have difficulty breathing or have a shortness of breath? [Respond with: breath(yes/no).]
***** Please press '.' (period) to respond to the question. *****
true .

?- breath(yes).
Covid Bot: Okay, let me write that down. Difficulty breathing is often one of the first major symptons you will
feel.

Now, do you feel any intense chest pain or a sense of pressure on your chest? [Respond with: chestpain(yes/
no).]
```



As can be seen, this is a result where the user has scored the maximum amount of points (they said yes to every question) and therefore immediately is brought to the information and links to what they should do.

Any additional documentation for each specific procedure and the program as a whole can be found inside of the chatbot_Covid.pl file.

Thank you for reading this documentation.