
SBE 404A - NETWORKING PROJECT

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Video:

<https://drive.google.com/file/d/1WmV16r5RH3QmgqwSAt7Abuq6hu1MzDpV/view?usp=sharing>

GitHub Repository: <https://github.com/AhmedKhaled8/Networks-Project>

Medical Chat Bot - Your Virtual Doctor

In this project we built a "Medical Chat Bot". It asks the user 9 questions about symptoms he/she may have, the user answers using 2 button Yes/No. The GUI was built using PyQt5.



We built a server using socket library in Python that allowed us to generate communication with the clients using TCP/IP connection. The GUI and the server handle the connections properly and handled.

```
[STARTING] server is starting ...  
[LISTENING] Server is listening on 192.168.1.8  
[NEW CONNECTION] ('192.168.1.8', 58223) connected.
```

When a question is answered, the message is sent from the client to the server using that communication and processed at the server until all answers are collected.

```
[ACTIVE CONNECTIONS] 1 clients have connected ...  
[('192.168.1.8', 58223)] sent a message : Yes  
[('192.168.1.8', 58223)] sent a message : Yes  
[('192.168.1.8', 58223)] sent a message : Yes  
[('192.168.1.8', 58223)] sent a message : Yes  
[('192.168.1.8', 58223)] sent a message : Yes
```

When all answers are collected, a decision tree model, which we built ourselves, is run with the input of the processed answers, it responds with a message that tells the possibility of an illness and a recommendation to see a doctor, take a medication, take some rest, etc.

The screenshot shows a web application window titled "Your Virtual Doctor". The main heading is "YOUR VIRTUAL DOCTOR". Below the heading, there is a list of questions from the "Auto Doctor":

- Do you have a cough? (Yes :You)
- Do you have a fever? (Yes :You)
- Do you have shortness of breath? (Yes :You)
- Are you experiencing any fatigue? (Yes :You)
- Do you have a sore throat? (Yes :You)
- Do you have a runny nose? (Yes :You)
- Do you have any muscle pain? (Yes :You)
- Do you have a headache? (Yes :You)
- Are you experiencing loss of taste or smell? (Yes :You)

Below the questions, a message states: "Auto Doctor: Mostly CoVID, see a doctor quickly." At the bottom of the window, there are two buttons: "Okay, thank you Dr." and "I want to answer the questions again."

Multiple clients can access to the server, each client has its own thread (connection) and it's totally independent of the other clients' connections to the server.

The screenshot shows two parallel instances of the "Your Virtual Doctor" application window. Each window has the heading "YOUR VIRTUAL DOCTOR".

The left window shows the following questions and answers:

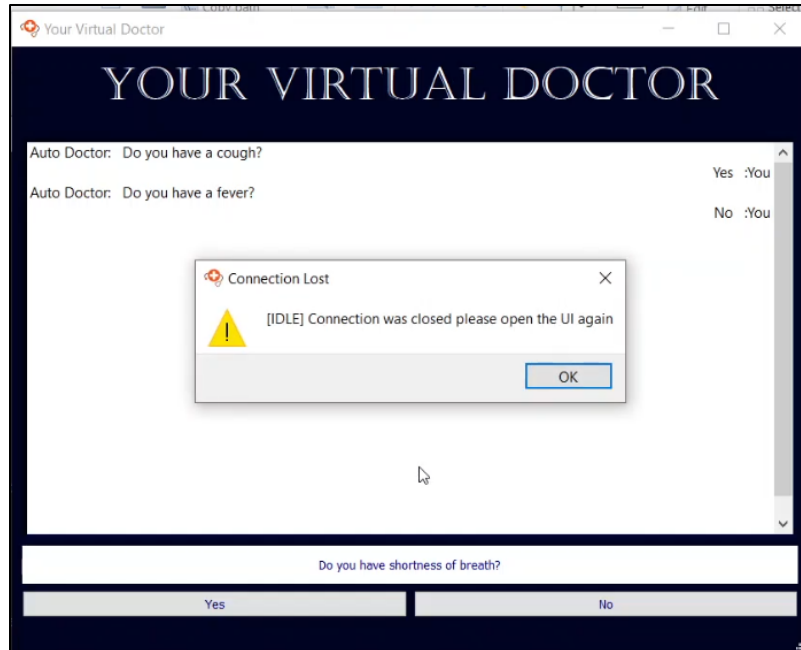
- Auto Doctor: Do you have a cough? (Yes :You)
- Auto Doctor: Do you have a fever? (No :You)

The right window shows the following questions and answers:

- Auto Doctor: Do you have a cough? (No :You)
- Auto Doctor: Do you have a fever? (No :You)

At the bottom of each window, there is a question: "Do you have shortness of breath?" with two buttons: "Yes" and "No".

A client's connection is timeout enabled, which means if the server didn't get a response from you "the client" for a specified time, which is specified in our case 20 seconds, the server closes the connection with that client and a pop-up message appears telling the user that the connection was closed as he/she was IDLE.



```
[NEW CONNECTION] ('192.168.1.8', 58255) connected.  
[ACTIVE CONNECTIONS] 1 clients have connected ...  
[('192.168.1.8', 58255)] sent a message : Yes  
[('192.168.1.8', 58255)] sent a message : No  
[TIME OUT] Timed out after 20 seconds  
[DISCONNECTED] ('192.168.1.8', 58255) has disconnected
```

TESTING

1) All answers are Yes



The screenshot shows a web application titled "Your Virtual Doctor". It contains a list of ten diagnostic questions, each followed by a "Yes :You" response. The questions are: "Do you have a cough?", "Do you have a fever?", "Do you have shortness of breath?", "Are you experiencing any fatigue?", "Do you have a sore throat?", "Do you have a runny nose?", "Do you have any muscle pain?", "Do you have a headache?", "Are you experiencing loss of taste or smell?", and "Mostly CoVID, see a doctor quickly." Below the list, a summary box states "Mostly CoVID, see a doctor quickly." At the bottom, there are two buttons: "Okay, thank you Dr." and "I want to answer the questions again."

Question	Answer
Auto Doctor: Do you have a cough?	Yes :You
Auto Doctor: Do you have a fever?	Yes :You
Auto Doctor: Do you have shortness of breath?	Yes :You
Auto Doctor: Are you experiencing any fatigue?	Yes :You
Auto Doctor: Do you have a sore throat?	Yes :You
Auto Doctor: Do you have a runny nose?	Yes :You
Auto Doctor: Do you have any muscle pain?	Yes :You
Auto Doctor: Do you have a headache?	Yes :You
Auto Doctor: Are you experiencing loss of taste or smell?	Yes :You
Auto Doctor: Mostly CoVID, see a doctor quickly.	Yes :You

Mostly CoVID, see a doctor quickly.

Okay, thank you Dr. I want to answer the questions again.

2) Yes/Yes/No/No/Yes/Yes/Yes/No/No



The screenshot shows the same "Your Virtual Doctor" web application. In this instance, the answers to the first nine questions are: Yes, Yes, No, No, Yes, Yes, Yes, No, and No. The tenth question, "Mostly Influenza, take an antipyretic and if the condition persists, go to a doctor.", has no answer. Below the list, a summary box states "Mostly Influenza, take an antipyretic and if the condition persists, go to a doctor." At the bottom, there are two buttons: "Okay, thank you Dr." and "I want to answer the questions again."

Question	Answer
Auto Doctor: Do you have a cough?	Yes :You
Auto Doctor: Do you have a fever?	Yes :You
Auto Doctor: Do you have shortness of breath?	No :You
Auto Doctor: Are you experiencing any fatigue?	No :You
Auto Doctor: Do you have a sore throat?	Yes :You
Auto Doctor: Do you have a runny nose?	Yes :You
Auto Doctor: Do you have any muscle pain?	Yes :You
Auto Doctor: Do you have a headache?	No :You
Auto Doctor: Are you experiencing loss of taste or smell?	No :You
Auto Doctor: Mostly Influenza, take an antipyretic and if the condition persists, go to a doctor.	

Mostly Influenza, take an antipyretic and if the condition persists, go to a doctor.

Okay, thank you Dr. I want to answer the questions again.

3) No/No/No/Yes/Yes/No/No/No/No

The screenshot shows a window titled "Your Virtual Doctor" with a dark blue header. Below the header, a list of questions is displayed on the left, and the corresponding answers are on the right. The questions are: "Do you have a cough?", "Do you have a fever?", "Do you have shortness of breath?", "Are you experiencing any fatigue?", "Do you have a sore throat?", "Do you have a runny nose?", "Do you have any muscle pain?", "Do you have a headache?", "Are you experiencing loss of taste or smell?", and "Just rest a bit." The answers are: "No", "No", "No", "Yes", "Yes", "No", "No", "No", "No", and "Just rest a bit." respectively. At the bottom, there are two buttons: "Okay, thank you Dr." and "I want to answer the questions again."

Question	Answer
Auto Doctor: Do you have a cough?	No :You
Auto Doctor: Do you have a fever?	No :You
Auto Doctor: Do you have shortness of breath?	No :You
Auto Doctor: Are you experiencing any fatigue?	Yes :You
Auto Doctor: Do you have a sore throat?	Yes :You
Auto Doctor: Do you have a runny nose?	No :You
Auto Doctor: Do you have any muscle pain?	No :You
Auto Doctor: Do you have a headache?	No :You
Auto Doctor: Are you experiencing loss of taste or smell?	No :You
Auto Doctor: Just rest a bit.	Just rest a bit.

4) All answers are No

The screenshot shows a window titled "Your Virtual Doctor" with a dark blue header. Below the header, a list of questions is displayed on the left, and the corresponding answers are on the right. The questions are: "Do you have a cough?", "Do you have a fever?", "Do you have shortness of breath?", "Are you experiencing any fatigue?", "Do you have a sore throat?", "Do you have a runny nose?", "Do you have any muscle pain?", "Do you have a headache?", "Are you experiencing loss of taste or smell?", and "You are totally fine :)". The answers are: "No", "No", "No", "No", "No", "No", "No", "No", "No", and "You are totally fine :)" respectively. At the bottom, there are two buttons: "Okay, thank you Dr." and "I want to answer the questions again."

Question	Answer
Auto Doctor: Do you have a cough?	No :You
Auto Doctor: Do you have a fever?	No :You
Auto Doctor: Do you have shortness of breath?	No :You
Auto Doctor: Are you experiencing any fatigue?	No :You
Auto Doctor: Do you have a sore throat?	No :You
Auto Doctor: Do you have a runny nose?	No :You
Auto Doctor: Do you have any muscle pain?	No :You
Auto Doctor: Do you have a headache?	No :You
Auto Doctor: Are you experiencing loss of taste or smell?	No :You
Auto Doctor: You are totally fine :)	You are totally fine :)