



# HEALTH ASSISTANT CHATBOT

Arun Sankar  
Prayag Krishna A  
VM Sreeram



## PROJECT DESCRIPTION

- A chatbot that answers health related queries
- Access to accurate health information crucial in today's world
- Target audience: Patients, medical professionals, and anyone interested in learning more about health.



## Dataset

- From [https://huggingface.co/datasets/medical\\_dialog](https://huggingface.co/datasets/medical_dialog)
- 1.2 lakh Query-Response pairs.
- Format: String - String
- Query: Description[.]Patient dialogue. Response: Doctor dialogue.



## A sample from dataset

id=11995

<https://www.healthcaremagic.com/questions/How-can-I-improve-my-skin-tone/149103>

Description

How can I improve my skin tone ?|

Dialogue

Patient:

r when i was born but gradually my skin became dark and my face is brown in colour i want to became white so is there any tips for becoming whiter especially any creams hello doctor i am 17 years old boy and my name is kamal i was whiter when i was born but gradually my skin became dark and my face is brown in colour i want to became white so is there any tips for becoming whiter especially any creams??? i have dry skin type..... pls doctor help me

Doctor:

hello kamalwelcome to health care magicthere is no such cream which will bring bck ur complexion if at all any is just on temporary basis.take care of ur diet.drink plenty of water.apply sun protective creams while going outside and wear sun glasses.have food rich in vitamins.take fresh fruits and juices.vitaminC rich foods like amla is good for skin.



# Preprocessed dataset

## Query

**How can I improve my skin tone ?r when i was born but gradually my skin became dark and my face is brown in colour i want to became white so is there any tips for becoming whiter especially any creams hello doctor i am 17 years old boy and my name is kamal i was whiter when i was born but gradually my skin became dark and my face is brown in colour i want to became white so is there any tips for becoming whiter especially any creams??? i have dry skin type..... pls doctor help me**


## Response

hello kamalwelcome to health care magicthere is no such cream which will bring bck ur complexion if at all any is just on temporary basis.take care of ur diet.drink plenty of water.apply sun protective creams while going outside and wear sun glasses.have food rich in vitamins.take fresh fruits and juices.vitaminC rich foods like amla is good for skin.



## IMPLEMENTATION

- Pretrained model from HuggingFace Transformers library:  
Google/flan-t5-base
- Performed train-test split: reserving 30% of the data as evaluation dataset.
- To each input sequence, a prefix is added. We concatenate the prefix with each document in the "Query" field, creating a list of input sequences.

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- Tokenize the inputs and the answer
  - The tokenized answer acts as the label
  - Rouge as compute metric for the trainer
  - Ran 3 epochs.
  - Hyperparams: Learning rate -  $3e-4$ , weight decay - 0.01
  - Trained for 10 hours
  - Evaluation metrics were calculated



# Evaluation

- Human (0 to 5 score)
  - Relevance:- 3
  - Accuracy:- 2
  - User satisfaction:- 3
  - Safety:- 3
- Automatic
  - BLEU score:- close to zero
  - Rouge score:- 0.19
  - Meteor score:- 0.33
  - Embedding similarity:- 0.52
  - CER score:- 0.21





# Evaluation

- A ROUGE score of 0.19 indicates moderate overlap between the generated responses and the reference responses
- Meteor considers precision, recall, and fragmentation in its evaluation.
- Cosine similarity indicates moderate semantic similarity
- The character error rate suggests a relatively low error rate



# User Interface

## Features:

- Users can input messages into the chat interface.
- Messages are displayed in a conversation-like format, distinguishing between user input and bot responses.
- The chatbot fetches responses from a Flask backend using a POST request and displays them in the chat interface

## Health Chatbot

Disclaimer: This chatbot is not a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition.

Why do i forget simple words and names?.Hi! I often get moments where I forget simple words and even names of people I am close to. Today the word was longitude and yesterday my word was the name Mark; who is someone I am very close to. Should I be concerned? It happens to me mainly with peoples names. Oh; and I am 16

Hi;It is not a matter of concern. You can have a word with a person close to you. It is not a matter of concern. You can have a word with a person close to

Send



## Challenges

- “Too natural”/informal language in patient query
- Inconsistent language in doctor response
- “HCM” prefix and doctor credential suffix in certain answers
- Some doctor responses are vague
- Due to lack of compute resources, just 3 epochs were ran. Hence the model shows unexpected behaviour for some questions.
- Since the model lacks patient history and operates without the oversight of a qualified medical professional, it prescribing medications is a bit risky.