

# Project Progress Report

## Medical QA system

NLP project (AIT)

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# Recap

# What is Medical QA system

## Problem statement

- Many people find it hard to get the health advice they need.
- Reasons include the high cost of seeing a doctor, medical information that's difficult to understand, and not being able to get advice quickly.
- This situation creates a gap in healthcare where people can't get the help they need when they need it.



# What is Medical QA system

Our project aims to develop a conversational agent tailored for providing medical advice and recommendations to users in a natural language format. Unlike traditional chatbots, our system is designed specifically to engage in dialogues focused on addressing medical inquiries and concerns from users



# Solution Requirement



Use classifier to determine appropriate responses based on user input

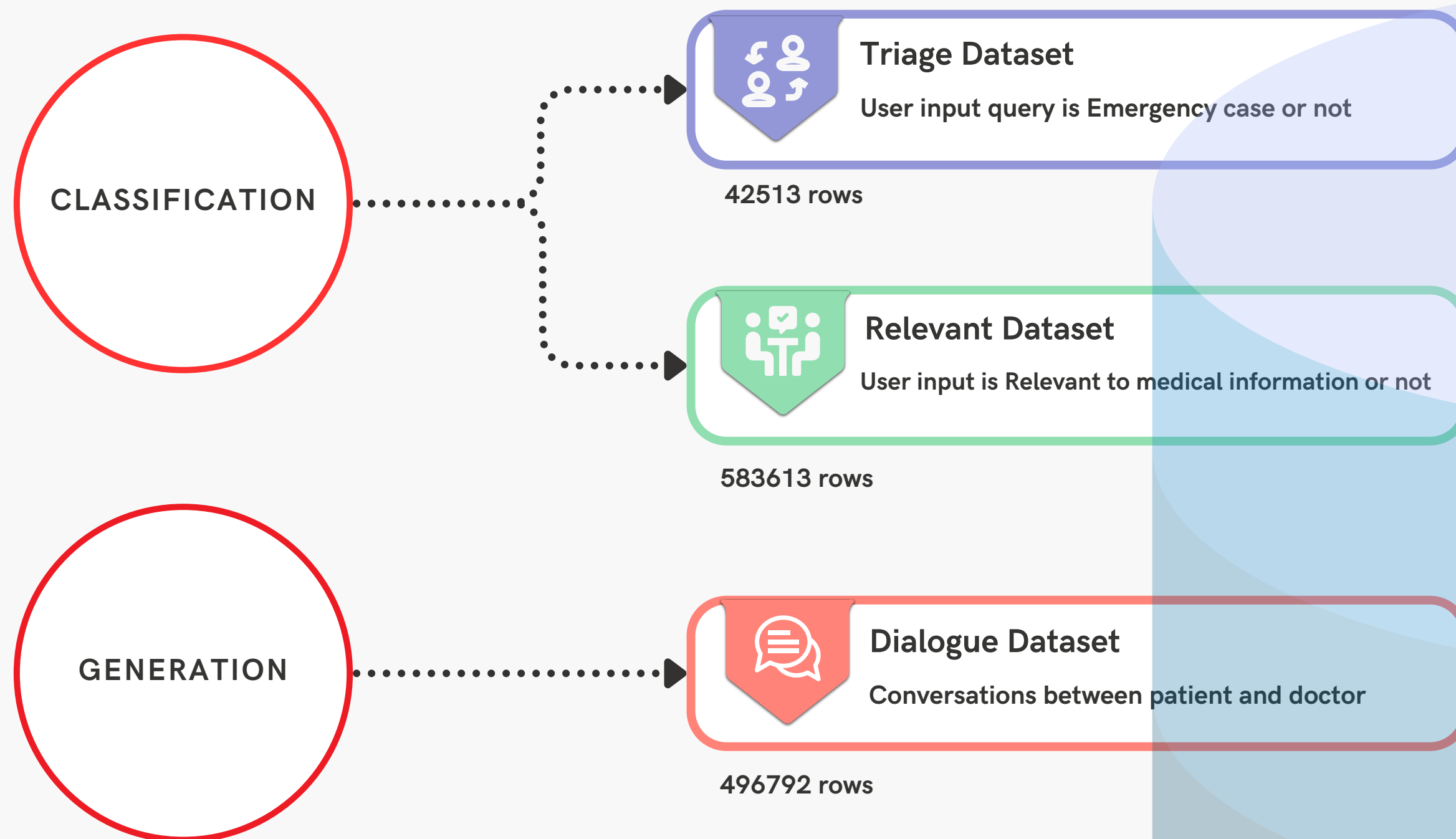
Experiment to find best classifier and LLM models

Fine-tune LLM with MedicalQA dataset to improve responses

Develop web chat interface

# Dataset

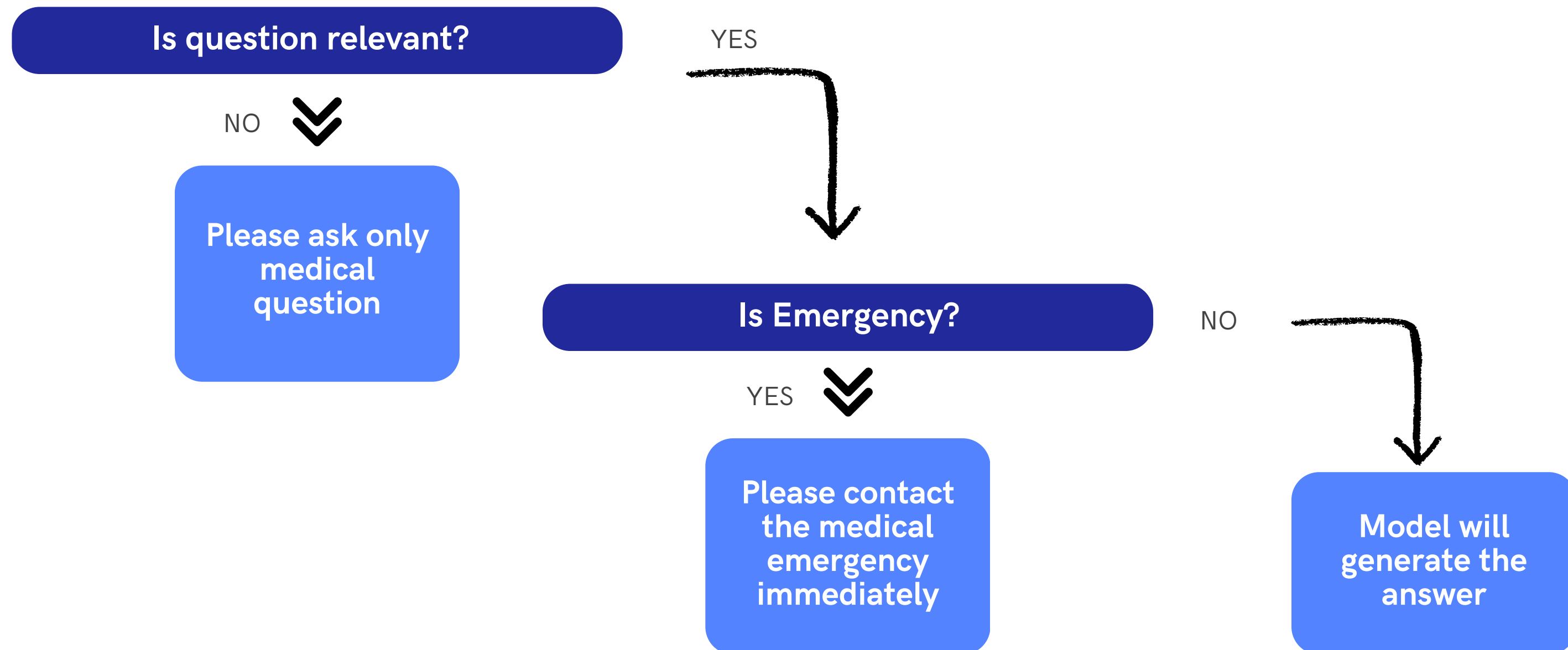
# About our dataset



# Architecture



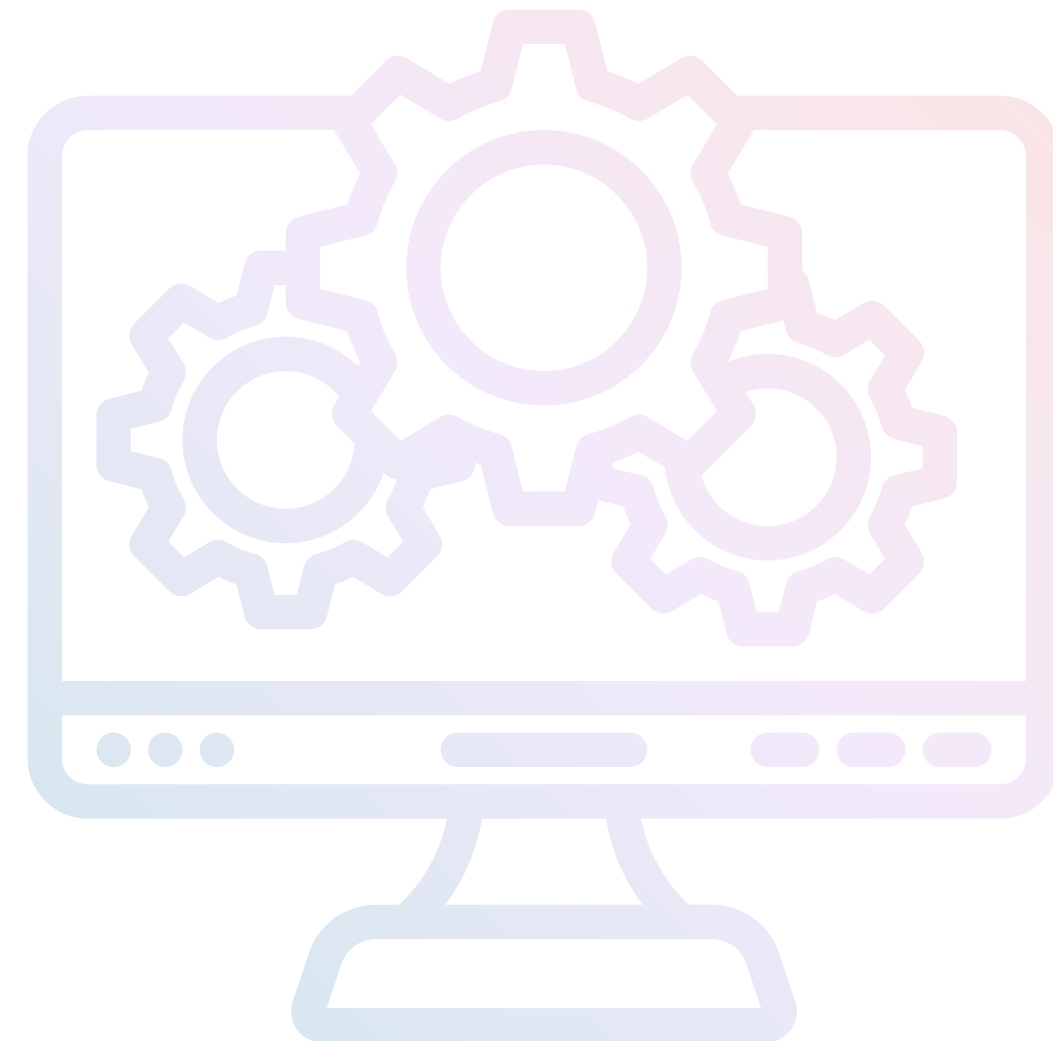
# Overall Architecture



# Models

# Models

✓	Triage Classification	BERT
✓	Relevant Classification	BERT
✓	Generation Model	BioBERT, T5, DialoGPT, BART, etc



# Relevant Classification Model

- This model is intended to use for classifying the Relevant or Non-Relevant case

```
# Example prediction
example_text = "I am coughing everyday."
prediction = predict_text(load_model, example_text, load_tokenizer, max_len, device)
predicted_label = relevant_encoder.inverse_transform([prediction])[0]
print(f"Predicted class for example text: {predicted_label}")
```

✓ 0.0s

Predicted class for example text: relevant

```
# Example prediction
example_text = "Who is lionel messi?"
prediction = predict_text(load_model, example_text, load_tokenizer, max_len, device)
predicted_label = relevant_encoder.inverse_transform([prediction])[0]
print(f"Predicted class for example text: {predicted_label}")
```

✓ 0.0s

Predicted class for example text: irrelevant

# Triage Classification Model

- This model is intended to use for classifying the Emergency or Non-Emergency case.
- We want to suggest urgent medical supervision in case of emergency

```
# Example prediction
example_text = "I'm experiencing sudden, severe abdominal pain on my right side. It's unbearable, and I'm vomiting."
prediction = predict_text(load_model, example_text, load_tokenizer, max_len=64, device=device)
predicted_label = triage_encoder.inverse_transform([prediction])[0]
print(f"Predicted class for example text: {predicted_label}")
```

✓ 0.0s

Predicted class for example text: urgent

```
# Example prediction
example_text = "I have a small cut on my finger that's not bleeding heavily. How should I clean and bandage it properly?"
prediction = predict_text(load_model, example_text, load_tokenizer, max_len=64, device=device)
predicted_label = triage_encoder.inverse_transform([prediction])[0]
print(f"Predicted class for example text: {predicted_label}")
```

✓ 0.0s

Predicted class for example text: non-urgent

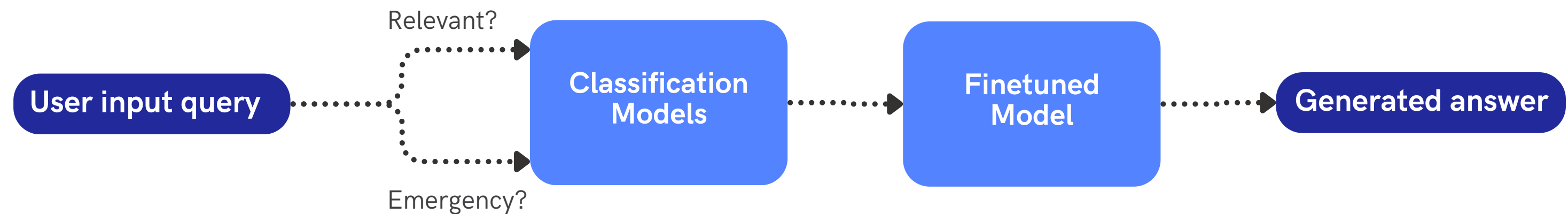
# Dialogue Generation Model

- We trained for below models

Encoders - BERT / Bio-BERT / ClinicalBERT

Decoders - DialoGPT

Encoders - Decoders - T5 / BioMistral / BART



Demo work

## Medical QA

Enter your query:

I have a sore throat and a runny nose

Send

### Chatbot Response

#### Answer:

Hi, It seems that you might be having a bacterial infection

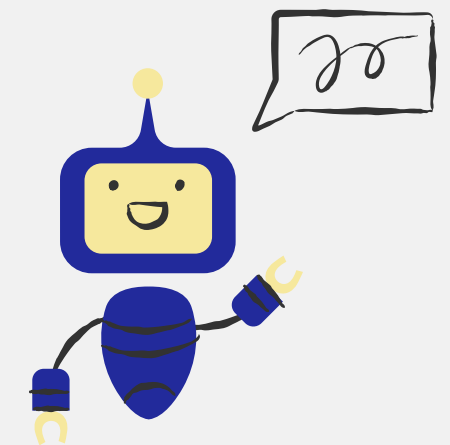
I suggest you to get a course of antibiotics along with anti-inflammatory medications like aceclofenac for pain relief

If the symptoms persists then you may need to get an FNAC done

Hope I have answered your query

Let me know if I can assist you further

Relevant and  
non-emergency case





## Medical QA

Enter your query:

What is the weather

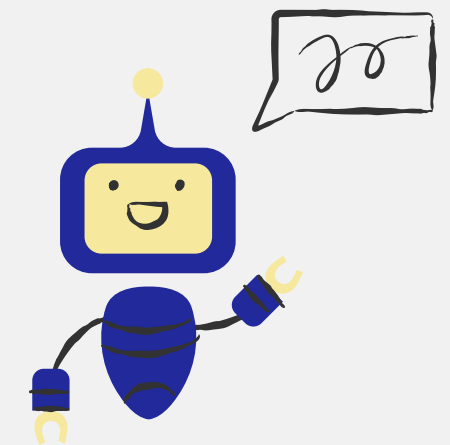
Send

### Chatbot Response

**Answer:**

This is not a question of relevancy with a medical situation and this application is only able to handle queries related to health and medicine

Non-relevant case



## Medical QA

Enter your query:

My friend cannot breathe and his heart stopped working

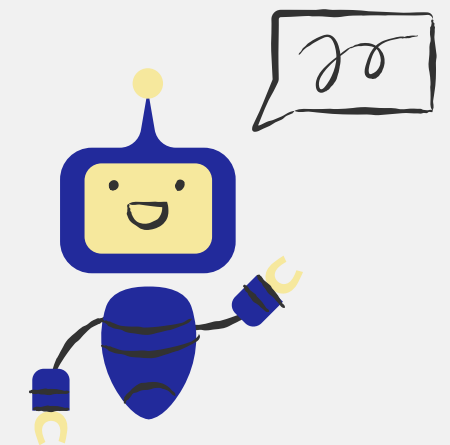
Send

### Chatbot Response

**Answer:**

This is a medical emergency so please contact your local hospital or emergency responder. For emergency medical assistance in Thailand, please dial 1669.

Emergency case



# Thank you for your time

Do you have any questions?