A

Major Project

On

CHATBOT FOR PREGNANT WOMEN USING ML

(Submitted in partial fulfillment of the requirements for the award of Degree)

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE AND ENGINEERING

By

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CMR TECHNICAL CAMPUS

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2019-2023

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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CERTIFICATE

This is to certify that the project entitled **“CHATBOT FOR PREGNANT WOMEN USING ML”** being submitted by **ANANYA CHOWDARY BHEEMANENI (197R1A05J6), SAI PRANAV GUNTHA (197R1A05L4) & SUMANTH CHILUMULA (197R1A05K1)** in partial fulfillment of the requirements for the award of the degree of B.Tech in Computer Science and Engineering to the Jawaharlal Nehru Technological University Hyderabad, is a record of bonafide work carried out by them under our guidance and supervision during the year 2022-23.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.

Najeema Afrin
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DIRECTOR

Dr. K. Srujan Raju
HOD

EXTERNAL EXAMINER

Submitted for viva voice Examination held on ________________________

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ANANYA CHOWDARY BHEEMANENI	**(197R1A05J6)**
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ABSTRACT

Artificial intelligence is transforming healthcare with a profound paradigm shift impacting diagnostic techniques, drug discovery, health analytics, interventions and much more. In this paper we focus on exploiting AI-based chatbot systems, mainly based on machine learning algorithms and Natural Language Processing, to understand and respond to needs of patients and their families. In particular, we describe an application scenario for an AI-chatbot delivering support to pregnant women, mothers, and families with young children, by giving them help and instructions in relevant situations.

Medical services are basic needs for human life although they normally have limited resources.Modern technologies are utilized for increasing service capability and decreasing the operation cost. Auto-response system or chatbot, which is widely known in the field of online businesses, can be applied to the medical services.

Therefore, the objective of this work is to implement the medical consultant system service by using chatbot Technology. In this project we focus on exploiting AI-based chatbot systems, mainly based on machine learning algorithms and Natural Language Processing, to understand and respond to needs of patients and their families. In particular, we describe an application scenario for an AI-chatbot delivering support to pregnant women, mothers, and families with young children, by giving them help and instructions in relevant situations.

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1. INTRODUCTION

1. INTRODUCTION

Healthcare is one of the top three biggest mobile trends in US. In recent study shows that US adults who own smartphone or other wireless device, have at least one health/fitness app on their smartphone (+16% over the past two years) and, generally, health Apps have some of the highest number of downloads. Two-thirds of women said they would use a mobile App to manage health-related issues . Similar trends are expected for Europe.

Also for this reason, smart-phones and wearable devices are more and more equipped with sensors and Apps able to collect an amount of health and wellness data which is by far bigger than that provided in the past decades of medical-device development. Correspondingly, a plethora of free and premium medical apps have been developed, with a variety of purposes and usage (e.g. drug dosage, medicine recommendations, symptoms diagnoses, etc.).

This allows to connect patients with healthcare laboratories , increase adherence to health monitoring, treatment regimen and medication manage chronic diseases provide educational contents and prevent infectious and sexually-transmitted diseases.

The diffusion of mobile devices to support medical and public health practices, referred to as mHealth has, therefore, the potential to increase accessibility and to support shifts towards prevention by contributing to make access to healthcare more equitable, and this is supported by several indicators: in Europe, for example, up to 50% of adults search online for health information , moreover, by the tech giant’s own calculations, of the 40.000 searches that are made every second (average value), 2.00 are health-related, but this raise concerns about the quality of the returned information.

2. LITERATURE SURVEY

2. LITERATURE SURVEY

2.1 Comparative study of cloud platforms to develop a Chatbot

AUTHORS: A. Patil, K. Marimuthu, N. Rao, R. Niranchana

ABSTRACT: Before chatbots there were simply bots: The invention of a chat-bot brought us to the new era of technology, the era of conversation service. A chatbot is a virtual person that can effectively talk to any human being with the help of interactive conversion textual skill. Now a days there are many cloud-based platforms available for developing and deploying the chatbot such as Microsoft bot framework, IBM Watson, Kore, AWS lambda, Microsoft Azure bot service, Chatfuel, Heroku and many more but all those techniques has some drawbacks such as built-in Artificial Intelligence, NLP, conversion service, programming etc. This paper represents the comparison between all cloud-based chatbot technologies with some constraint such as built-in AI, setup time, completion time, complexity etc. Finally, by the comparison, we will get to know that which cloud platform is efficient and suitable for developing chatbot.

2.2 SHIHbot:Facebook chatbot for Health Information on HIV/AIDS.

AUTHORS: J. Brixey, R. Hoegen, W. Lan, J. Rusow, K. Singla, X. Yin.

ABSTRACT: We present the implementation of an autonomous chatbot, deployed on Facebook, which answers a wide variety of sexual health questions on HIV/AIDS. The chatbot's response database is compiled from professional medical and public health resources in order to provide reliable information to users. The system's backend is NPCEditor, a response selection platform trained on linked questions and answers; to our knowledge this is the first retrieval-based chatbot deployed on a large public social network.

2.3 A SURVEY ON WEB CONVERSATIONAL BOT DESIGN

AUTHORS: Anik Raj C,Christo Jacob,Ajitha Mohanan

ABSTRACT: Human-Computer Speech is picking up energy as a strategy of computer interaction. There has been a late upsurge in discourse based web crawlers and assistants, for example, Siri, Google Chrome and Cortana. Natural Language Processing (NLP) methods, for example, NLTK for Python can be connected to break down discourse, and smart reactions can be found by outlining an engine to give suitable human like reactions. This sort of project is known as a Chatbot, which is the center of this study. This paper introduces a study on the procedures used to outline Chatbots and an examination is made between various configuration systems from thirteen deliberately chosen papers as indicated by the primary techniques embraced. These papers are illustrative of the huge upgrades in Chatbots in the most recent decade.

2.4 Sanative Chatbot For Health Seekers

AUTHORS: V.Manoj Kumar, A.Keerthana, M.Madhumitha, S.Valliammai, V.Vinithasri,

ABSTRACT: Now a day people tend to seek knowledge or information from internet that concern with health through online healthcare services. The basic aim of this system is to bridge the vocabulary gap between the health providers by proving instant replies to the questions posted by patients. Automatic generated content for healthcare services are chosen instead of traditional community generated systems because they are reliable, compatible, and provide instant replies. This paper proposes a scheme to code the medical record using local mining and global approaches. Local mining aims to code the medical records by extracting the medical concepts from individual record and then mapping them to terminologies based on external authenticated vocabularies. Local Mining establishes a tri-stage framework to accomplish this task. Global learning aims to learn missing key concepts and propagates precise terminologies among underlying connected records over a large collection.

2.5 Pharmabot: a pediatric generic medicine consultant chatbot

AUTHORS: B.E.V. Comendador, B.M.B. Francisco, J.S. Medenilla and S. Mae.

ABSTRACT: The paper introduces a Pharmabot: A Pediatric Generic Medicine Consultant Chatbot. It is a conversational chatbot that is designed to prescribe, suggest and give information on generic medicines for children. The study introduces a computer application that act as a medicine consultant for the patients or parents who are confused with the generic medicines. The researchers use Left and Right Parsing Algorithm in their study to come up with the desired result.

3. SYSTEM ANALYSIS

3. SYSTEM ANALYSIS

System Analysis is the important phase in the system development process. The System is studied to the minute details and analyzed. The system analyst plays an important role of an interrogator and dwells deep into the working of the present system. In analysis, a detailed study of these operations performed by the system and their relationships within and outside the system is done. A key question considered here is, "what must be done to solve the problem?" The system is viewed as a whole and the inputs to the system are identified. Once analysis is completed the analyst has a firm understanding of what is to be done.

3.1 PROBLEM DEFINITION

Cardiovascular disease(CVD) is a leading cause of deaths worldwide, accounting for approximately one third of all deaths. Prevention of CVD requires timely identification of people at risk. Over the last two decades, various prediction models have been developed. But these models had thier own set of issues and disadvantages. Hence, there was a absolute necessary to develop a reliable heart disease prediction model with high accuracy to help people to predict thier medical conditions.

3.2 EXISTING SYSTEM

The feeling of interacting with a dehumanized entity when patients are asked to fill forms or answer to a given set of questions by using a predefined given set of answers. This makes patients more frustrated since they cannot be not able to fully express their symptoms, worries and pains. Chatbots let patients to feel more comfortable, overcoming the biasing of a machine interaction.

3.2.1 DISADVANTAGES OF THE EXISTING SYSTEM

- The replies given existing forms and applications are dehumanized and robotic.
- The data trained in existing system can be faulty or not verified.
- These old mode of query solving solutions take time to find the answers to the queries of the users.
- The accuracy of the replies is low.

3.3 PROPOSED SYSTEM

In this project we are designing CHATBOT application which helps pregnant women's to get answers for their queries or doubt.To build this project we used NLP (natural language processing toolkit) and Machine Learning Algorithm called LSTM (Long Short Term Memory).LSTM will be trained with all possible questions and answers and whenever user ask any question then LSTM will predict answer for that question and handover that answer to chatbot to display to user.To train LSTM we have used some questions and answers related to pregnancy as no public dataset available so we gather some questions and answers from internet and all this questions are saved in dataset.

3.3.1 ADVANTAGES OF PROPOSED SYSTEM

- Assistance on time from any place.
- Chatbot helps to get answers quickly in a humanoid way.
- All the data set trained to the bot will be cross checked to avoid spreading wrong/fake answers.
- Chatbot will be active every minute of the clock to help in query solving.
- The feedback given by the bot will be similar to that off a doctor, as we are going to only use data set that is verified by doctors.

3.4 FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and a business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. Three key considerations involved in the feasibility analysis:

- Economic Feasibility
- Technical Feasibility
- Social Feasibility

3.4.1 ECONOMIC FEASIBILITY

The developing system must be justified by cost and benefit. Criteria to ensure that effort is concentrated on a project, which will give best, return at the earliest. One of the factors, which affect the development of a new system, is the cost it would require.

The following are some of the important financial questions asked during preliminary investigation:

- The costs conduct a full system investigation.
- The cost of the hardware and software.
- The benefits in the form of reduced costs or fewer costly errors.

Since the system is developed as part of project work, there is no manual cost to spend for the proposed system. Also all the resources are already available, it give an indication that the system is economically possible for development.

3.4.2 TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

3.4.3 BEHAVIORAL FEASIBILITY

This includes the following questions:

- Is there sufficient support for the users?
- Will the proposed system cause harm?

The project would be beneficial because it satisfies the objectives when developed and installed. All behavioral aspects are considered carefully and conclude that the project is behaviorally feasible

3.5 HARDWARE & SOFTWARE REQUIREMENTS

3.5.1 HARDWARE REQUIREMENTS:

- RAM: 4 gb and above (8 or 16 recommended).
- Hard Disk: 15 gb and above.
- Processor: Core 2 duo and above.

3.5.2 SOFTWARE REQUIREMENTS:

- Windows 7 and above
- Python 3.7 and above
- Pandas, NumPy, Sklearn

4.ARCHITECTURE

4.ARCHITECTURE

4.1 PROJECT ARCHITECTURE

This project architecture shows the procedure followed for classification, starting from input to final prediction.

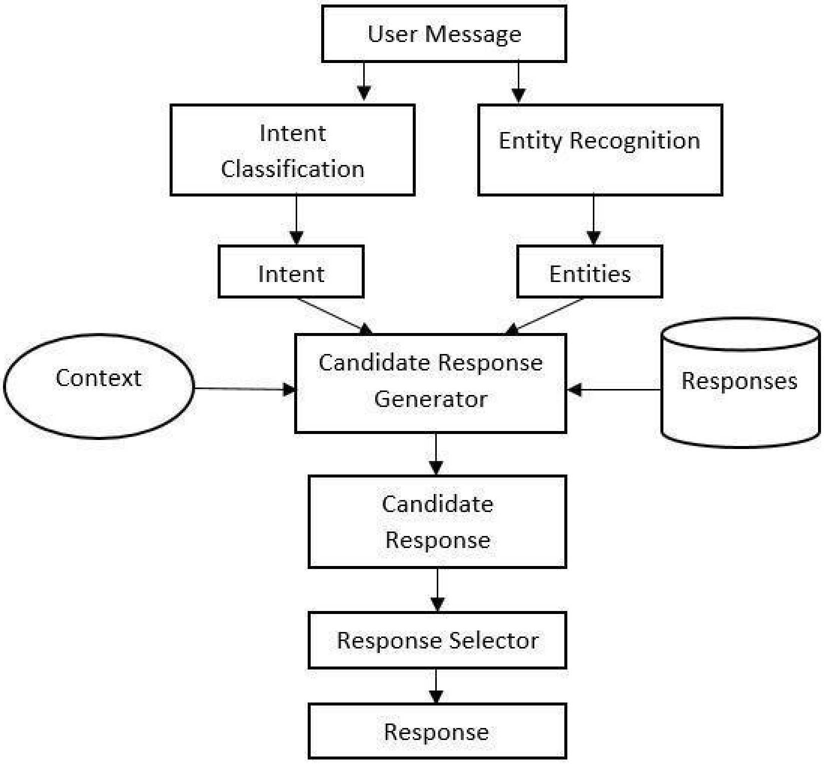


Figure 4.1 Architecture of Chatbot for pregnant women

4.2 DESCRIPTION

In this project we are designing CHATBOT application which helps pregnant women's to get answers for their queries or doubt.To build this project we used NLP (natural language processing toolkit) and Machine Learning Algorithm called LSTM (Long Short Term Memory).LSTM will be trained with all possible questions and answers and whenever user ask any question then LSTM will predict answer for that question and handover that answer to chatbot to display to user.To train LSTM we have used some questions and answers related to pregnancy as no public dataset available so we gather some questions and answers from internet and all this questions are saved in dataset.

4.3 USE CASE DIAGRAM

A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has. The use cases are represented by either circles or ellipses. The actors are often shown as stick figures.

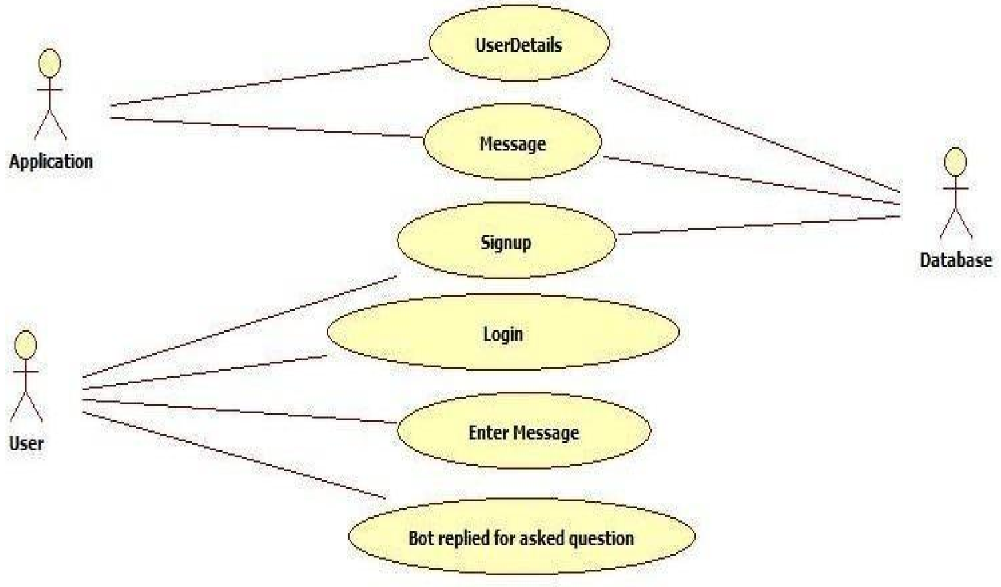


Figure 4.2 Use Case Diagram for Chatbot for pregnant women

4.4 CLASS DIAGRAM

Class diagram is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations(or methods), and the relationships among objects.

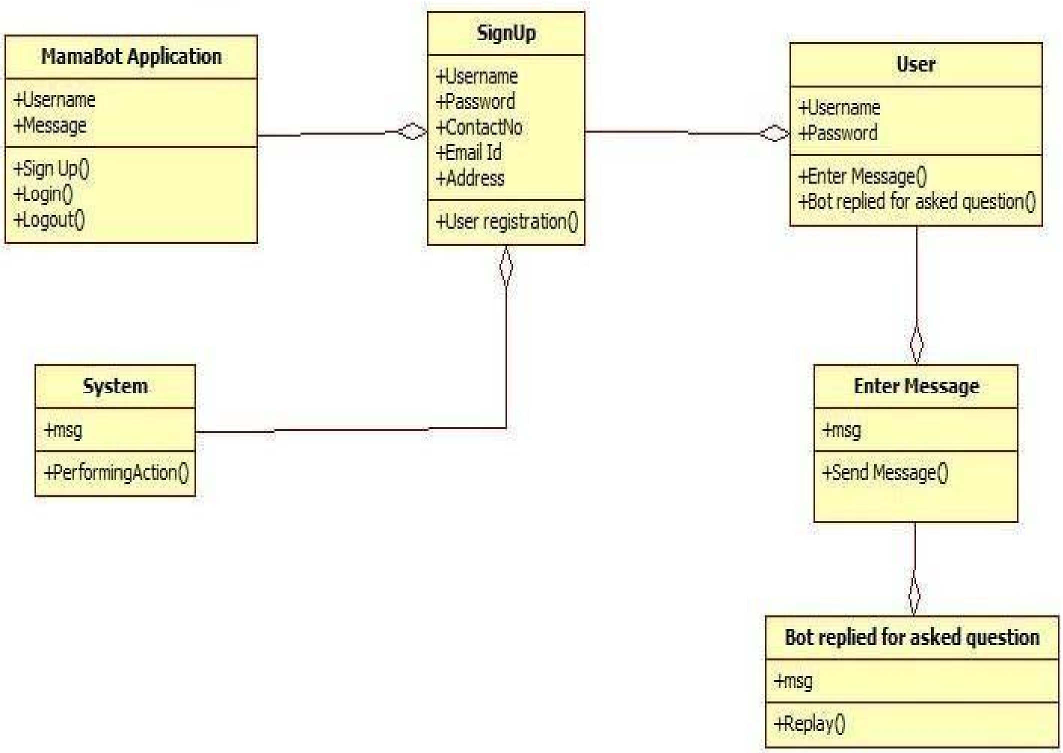


Figure 4.3 Class Diagram for Chatbot for pregnant women

4.5 SEQUENCE DIAGRAM

A sequence diagram shows object interactions arranged in time sequence. It depicts the objects involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the logical view of the system under development.

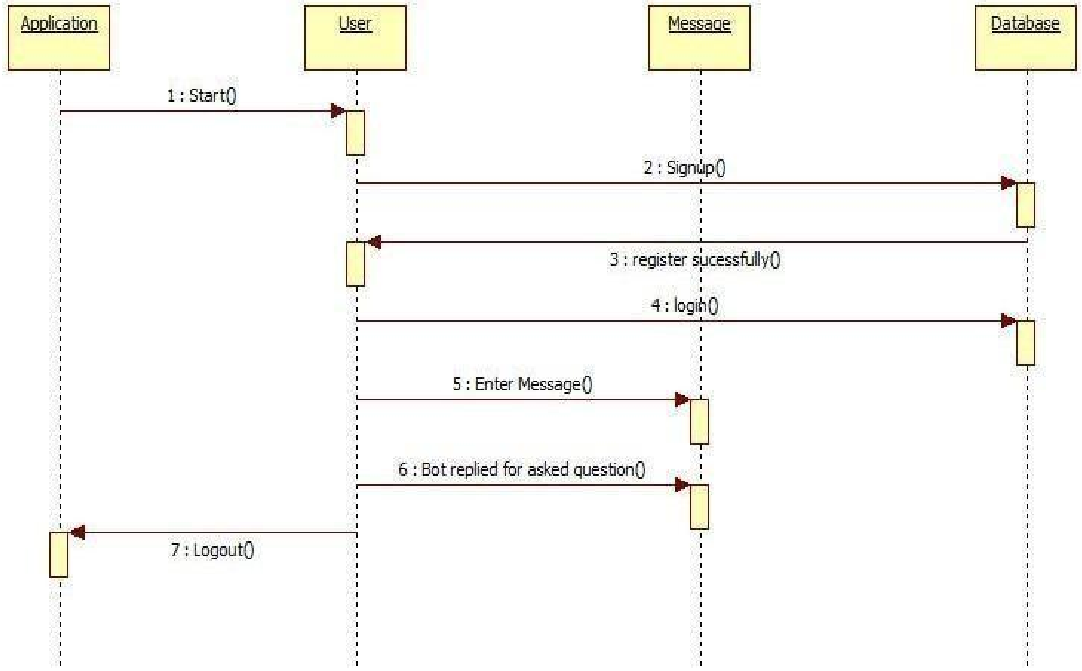


Figure 4.4 Sequence Diagram for Chatbot for pregnant women

4.6 ACTIVITY DIAGRAM

Activity diagrams are graphical representations of work flows of stepwise activities and actions with support for choice, iteration and concurrency. They can also include elements showing the flow of data between activities through one or more data stores.

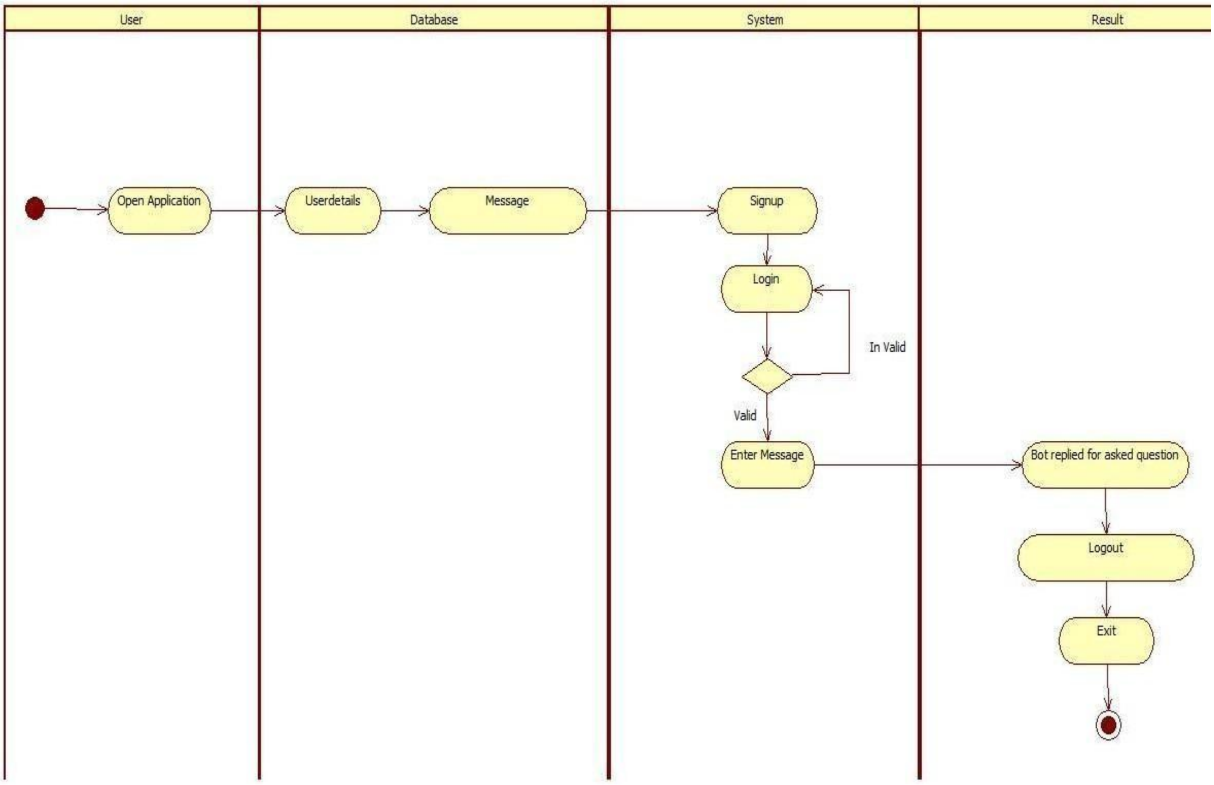


Figure 4.5 Activity Diagram for Chatbot for pregnant women

5.IMPEMENTATION

5.1 SAMPLE CODE

```
my=open('/content/FinaldataV1.json','r')
jsondata=my.read()
intents=json.loads(jsondata)
print(intents)

import json
import numpy as np
import nltk
# nltk.download('punkt')
from nltk.stem.porter import PorterStemmer
import torch
import torch.nn as nn
from torch.utils.data import Dataset,DataLoader
my=open('/content/FinaldataV1.json','r')
jsondata=my.read() intents=json.loads(jsondata)
stemmer = PorterStemmer()

def tokenize(sentence):
 """
split sentence into array of words/tokens
a token can be a word or punctuation character, or number
 """
return nltk.word_tokenize(sentence)

def stem(word):
   """
stemming = find the root form of the word
examples:
words = ["organize", "organizes", "organizing"]
words = [stem(w) for w in words]
 -> ["organ", "organ", "organ"]
   """
```

```
return stemmer.stem(word.lower())
def bag_of_words(tokenized_sentence, words):
  """
return bag of words array:
1 for each known word that exists in the sentence, 0 otherwise
example:
sentence = ["hello", "how", "are", "you"]
words = ["hi", "hello", "I", "you", "bye", "thank", "cool"]
bog   = [  0 ,    1 ,    0 ,  1 ,    0 ,    0 ,      0]
  """
# stem each word
sentence_words = [stem(word) for word in tokenized_sentence]
# initialize bag with 0 for each word
bag = np.zeros(len(words), dtype=np.float32)
for idx, w in enumerate(words):
if w in sentence_words:
bag[idx] = 1
return bag
all_words = []
tags = []
xy = []
for intent in intents['intents']:
tag = intent['tag']
# add to tag list
tags.append(tag)
for pattern in intent['patterns']:
# tokenize each word in the sentence
w = tokenize(pattern)
# add to our words list
all_words.extend(w)
# add to xy pair
xy.append((w, tag))
```

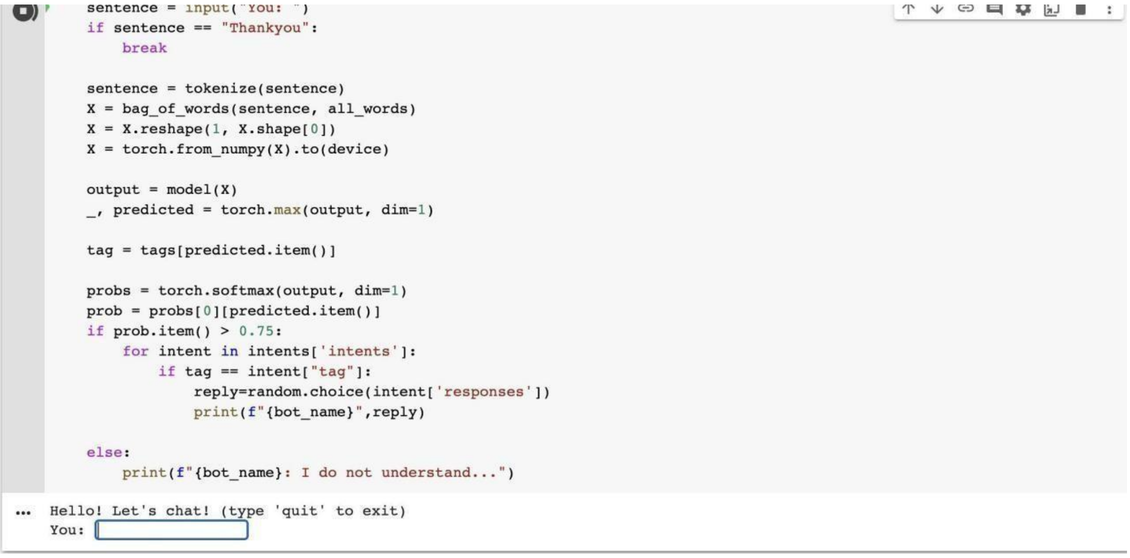
```
# stem and lower each word
ignore_words = ['?', '.', '!']
all_words = [stem(w) for w in all_words if w not in ignore_words]
# remove duplicates and sort
all_words = sorted(set(all_words))
tags = sorted(set(tags))

print(len(xy), "patterns")
print(len(tags), "tags:", tags)
print(len(all_words), "unique stemmed words:", all_words)
# create training data
X_train = []
y_train = []
for (pattern_sentence, tag) in xy:
# X: bag of words for each pattern_sentence
bag = bag_of_words(pattern_sentence, all_words)
X_train.append(bag)
# y: PyTorch CrossEntropyLoss needs only class labels, not one-hot
label = tags.index(tag)
y_train.append(label)
X_train = np.array(X_train)
y_train = np.array(y_train)
num_epochs = 1000
batch_size = 8
learning_rate = 0.001
input_size = len(X_train[0])
hidden_size = 8
output_size = len(tags)
print(input_size, output_size)
class ChatDataset(Dataset):
  def __init__(self):
     self.n_samples = len(X_train)
     self.x_data = X_train
     self.y_data = y_train
  if (epoch+1) % 100 == 0:
      print (f'Epoch [{epoch+1}/{num_epochs}], Loss: {loss.item():.4f}')
print(f'final loss: {loss.item():.4f}')
data = {
"model_state": model.state_dict(),
"input_size": input_size,
"hidden_size": hidden_size,
"output_size": output_size,
"all_words": all_words,
"tags": tags
}
FILE = "s.pth"
torch.save(data, FILE)
print(f'training complete. file saved to {FILE}')
import torch
import torch.nn as nn
class NeuralNet(nn.Module):
def__init_(self, input_size, hidden_size, num_classes):
      super(NeuralNet, self)._init_()
      self.l1 = nn.Linear(input_size, hidden_size)
      self.l2 = nn.Linear(hidden_size, hidden_size)
      self.l3 = nn.Linear(hidden_size, num_classes)
      self.relu = nn.ReLU()
def forward(self, x):
      out =  self.l1(x)
      out = self.relu(out)
      out = self.l2(out)
      out = self.relu(out)
      out = self.l3(out)
      # no activation and no softmax at the end
      return out
```

```
import random
import json

FILE = "s.pth"
data = torch.load(FILE)

input_size = data["input_size"]
hidden_size = data["hidden_size"]
output_size = data["output_size"]
all_words = data['all_words']
tags = data['tags']
model_state = data["model_state"]

model = NeuralNet(input_size, hidden_size, output_size).to(device)
model.load_state_dict(model_state)
model.eval()

bot_name = "ChatBOT: "
print("Hello! Let's chat! (type 'quit' to exit)")
while True:
# sentence = "do you use credit cards?"
sentence = input("You: ")
if sentence == "Thankyou":
      break

   sentence = tokenize(sentence)
   X = bag_of_words(sentence, all_words)
   X = X.reshape(1, X.shape[0])
   X = torch.from_numpy(X).to(device)

   output = model(X)
   _, predicted = torch.max(output, dim=1)
```

```
tag = tags[predicted.item()]
probs = torch.softmax(output, dim=1)
prob = probs[0][predicted.item()]
 if prob.item() > 0.75:
for intent in intents['intents']:

if tag == intent["tag"]:
    reply=random.choice(intent['responses'])
    print(f"{bot_name}",reply)
 else:
     print(f"{bot_name}: I do not understand...")
```

6.RESULTS

6. RESULTS



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    break

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else:
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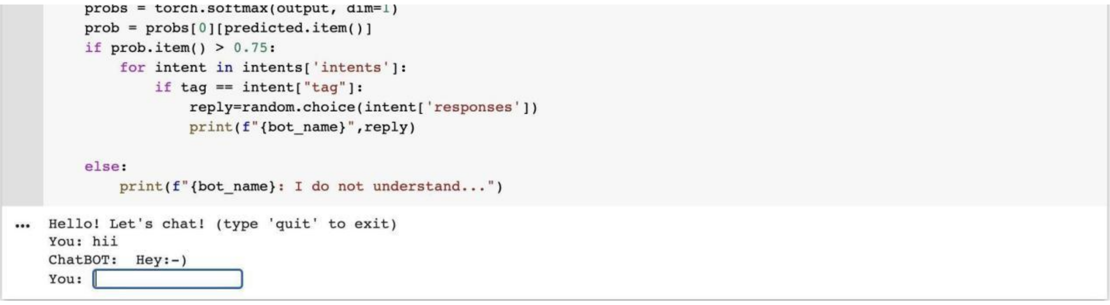
```

```
Hello! Let's chat! (type 'quit' to exit)
You:
```

Screenshot 6.1 Execution of Chatbot for Pregnant Women



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else:
    print(f"{bot_name}: I do not understand...")
```
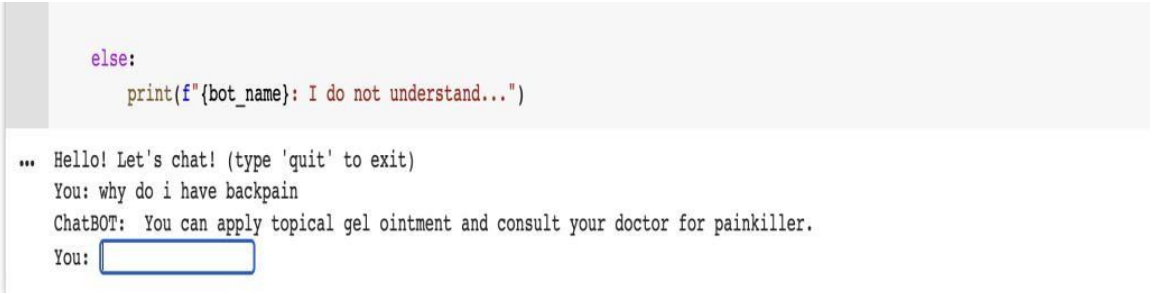

```
Hello! Let's chat! (type 'quit' to exit)
You: hii
ChatBOT:  Hey:-)
You:
```

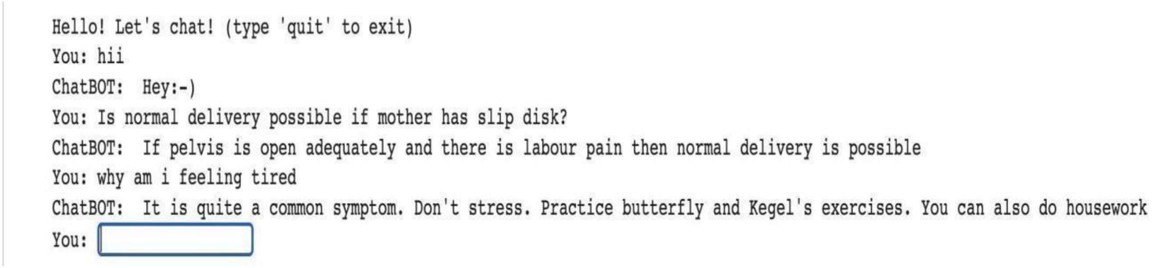
Screenshot 6.2 Execution of Chatbot for Pregnant Women



```
    else:
        print(f"{bot_name}: I do not understand...")
```

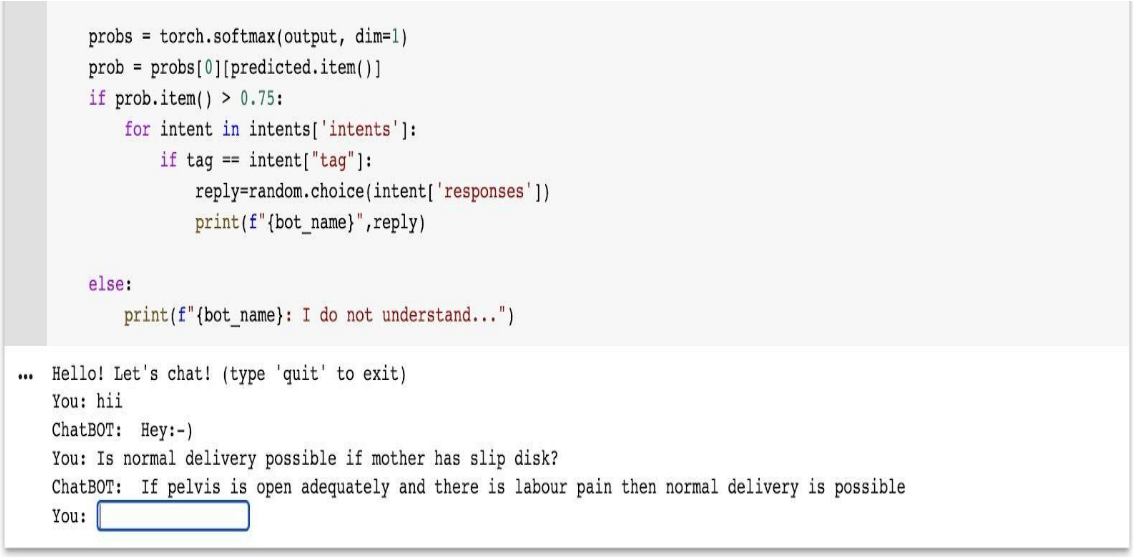
```
... Hello! Let's chat! (type 'quit' to exit)
    You: why do i have backpain
    ChatBOT:  You can apply topical gel ointment and consult your doctor for painkiller.
    You:
```

Screenshot 6.3 Replies of Chatbot for Pregnant Women



```
Hello! Let's chat! (type 'quit' to exit)
You: hii
ChatBOT:  Hey:-)
You: Is normal delivery possible if mother has slip disk?
ChatBOT:  If pelvis is open adequately and there is labour pain then normal delivery is possible
You: why am i feeling tired
ChatBOT:  It is quite a common symptom. Don't stress. Practice butterfly and Kegel's exercises. You can also do housework
You:
```

Screenshot 6.4 Replies of Chatbot for Pregnant Women



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            print(f"{bot_name}",reply)

else:
    print(f"{bot_name}: I do not understand...")
```

```
... Hello! Let's chat! (type 'quit' to exit)
    You: hii
    ChatBOT:  Hey:-)
    You: Is normal delivery possible if mother has slip disk?
    ChatBOT:  If pelvis is open adequately and there is labour pain then normal delivery is possible
    You:
```

Screenshot 6.5 Response to query screenshot

7. TESTING

7.TESTING

7.1 INTRODUCTION TO TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, subassemblies, assemblies and/or a finished product. It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of tests. Each test type addresses a specific testing requirement.

7.2 TYPES OF TESTING

7.2.1 UNIT TESTING

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .It is done after the completion of an individual unit before integration. This is a structural testing that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

7.2.2 INTEGRATION TESTING

Integration tests are designed to test integrated software components to determine if they actually run as one program. Integration tests demonstrate that although the components were individually satisfactory, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

7.2.3 FUNCTIONAL TESTING

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals. Functional testing is centered on the following items:

Valid Input : identified classes of valid input must be accepted.
Invalid : identified classes of invalid input must
Input be rejected.
Functions :. identified functions must be exercised.
Output : identified classes of application outputs
must be exercised

Systems/Procedures: interfacing systems or procedures must be invoked. Organization and preparation of functional tests is focused on requirements, key functions, or special test cases.

7.3 TEST CASES

7.3.1 CLASSIFICATION

Test case ID	Test case name	Purpose	Input	Output
1.	Answer prediction	To clarify the doubts of a pregnant woman	Queries of pregnant women or their families	The output is the answer to the question asked by pregnant women

8.CONCLUSION

8.CONCLUSION & FUTURE SCOPE

8.1 PROJECT CONCLUSION

Healthcare is one of the top three biggest mobile trends in US. In recent study shows that US adults who own smartphone or other wireless device, have at least one health/fitness app on their smartphone (+16% over the past two years) and, generally, health Apps have some of the highest number of downloads. Two-thirds of women said they would use a mobile App to manage health-related issues . Similar trends are expected for Europe.

In this project we are designing CHATBOT application which helps pregnant women's to get answers for their queries or doubt.To build this project we used NLP (natural language processing toolkit) and Machine Learning Algorithm called LSTM (Long Short Term Memory).LSTM will be trained with all possible questions and answers and whenever user ask any question then LSTM will predict answer for that question and handover that answer to chatbot to display to user.To train LSTM we have used some questions and answers related to pregnancy as no public dataset available so we gather some questions and answers from internet and all this questions are saved in dataset.

8.2 FUTURE SCOPE

The main objective of our project is to serve wide audience across the globe, for which we would like to update the chabot by adding more language compatability to it. And the accuracy of out project is around 100 percent, but with time and advanced hardware we can try to further improve the dataset of our project. The datasets that are available to public are very old data and is very less, so we would like to further improve the training process by providing bigger datasets. With availability of advanced hardware, we can further reduce the time taken to predict the results. We also have plans to further improve the GUI(graphical user interface).

9.BIBILIOGRAPHY

9. BIBILIOGRAPHY

9.1 REFERENCES

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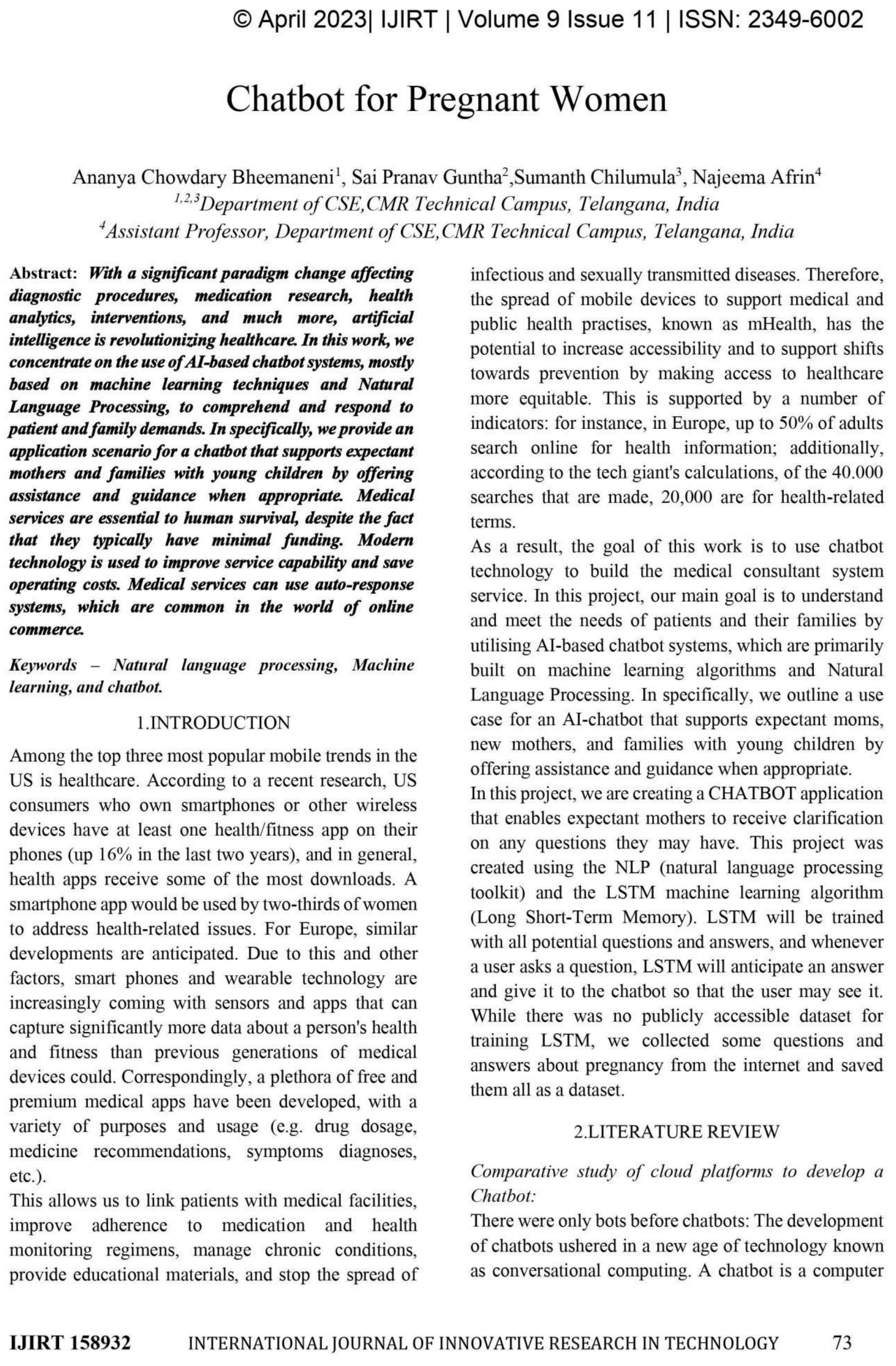
3. Nguyen, M. (2017). How artificial intelligence & machine learning produced robots we can talk to. Business Insider. Retrieved March 9, 2019

9.2 GITHUB LINK

https://github.com/ananyaj6/Major-Project

10.PAPER PUBLICATION



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Chatbot for Pregnant Women

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Abstract: ***With a significant paradigm change affecting diagnostic procedures, medication research, health analytics, interventions, and much more, artificial intelligence is revolutionizing healthcare. In this work, we concentrate on the use of AI-based chatbot systems, mostly based on machine learning techniques and Natural Language Processing, to comprehend and respond to patient and family demands. In specifically, we provide an application scenario for a chatbot that supports expectant mothers and families with young children by offering assistance and guidance when appropriate. Medical services are essential to human survival, despite the fact that they typically have minimal funding. Modern technology is used to improve service capability and save operating costs. Medical services can use auto-response systems, which are common in the world of online commerce.***

Keywords – Natural language processing, Machine learning, and chatbot.

1.INTRODUCTION

Among the top three most popular mobile trends in the US is healthcare. According to a recent research, US consumers who own smartphones or other wireless devices have at least one health/fitness app on their phones (up 16% in the last two years), and in general, health apps receive some of the most downloads. A smartphone app would be used by two-thirds of women to address health-related issues. For Europe, similar developments are anticipated. Due to this and other factors, smart phones and wearable technology are increasingly coming with sensors and apps that can capture significantly more data about a person's health and fitness than previous generations of medical devices could. Correspondingly, a plethora of free and premium medical apps have been developed, with a variety of purposes and usage (e.g. drug dosage, medicine recommendations, symptoms diagnoses, etc.).

This allows us to link patients with medical facilities, improve adherence to medication and health monitoring regimens, manage chronic conditions, provide educational materials, and stop the spread of infectious and sexually transmitted diseases. Therefore, the spread of mobile devices to support medical and public health practises, known as mHealth, has the potential to increase accessibility and to support shifts towards prevention by making access to healthcare more equitable. This is supported by a number of indicators: for instance, in Europe, up to 50% of adults search online for health information; additionally, according to the tech giant's calculations, of the 40.000 searches that are made, 20,000 are for health-related terms.

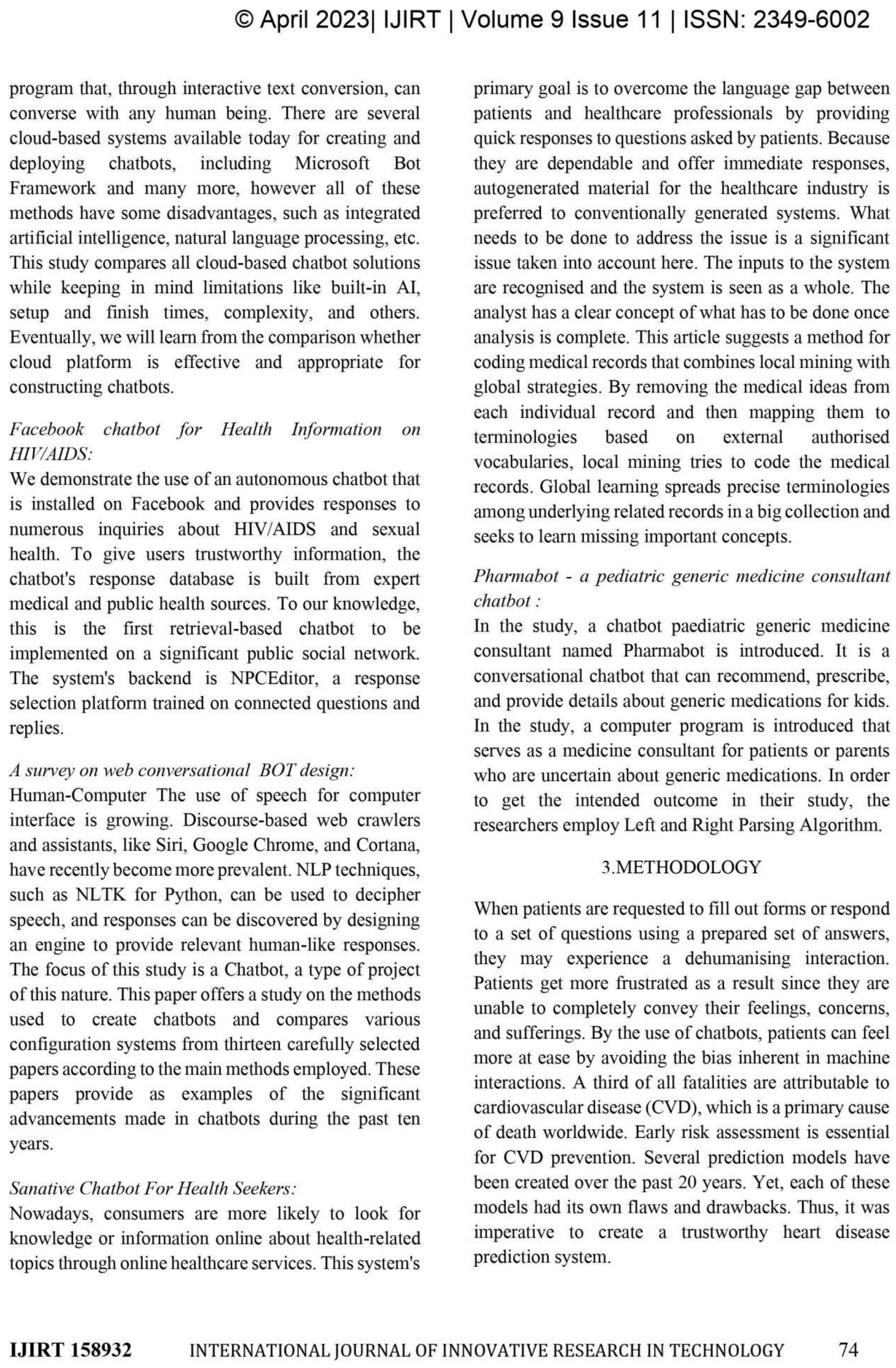
As a result, the goal of this work is to use chatbot technology to build the medical consultant system service. In this project, our main goal is to understand and meet the needs of patients and their families by utilising AI-based chatbot systems, which are primarily built on machine learning algorithms and Natural Language Processing. In specifically, we outline a use case for an AI-chatbot that supports expectant moms, new mothers, and families with young children by offering assistance and guidance when appropriate.

In this project, we are creating a CHATBOT application that enables expectant mothers to receive clarification on any questions they may have. This project was created using the NLP (natural language processing toolkit) and the LSTM machine learning algorithm (Long Short-Term Memory). LSTM will be trained with all potential questions and answers, and whenever a user asks a question, LSTM will anticipate an answer and give it to the chatbot so that the user may see it. While there was no publicly accessible dataset for training LSTM, we collected some questions and answers about pregnancy from the internet and saved them all as a dataset.

2.LITERATURE REVIEW

Comparative study of cloud platforms to develop a Chatbot:

There were only bots before chatbots: The development of chatbots ushered in a new age of technology known as conversational computing. A chatbot is a computer



program that, through interactive text conversion, can converse with any human being. There are several cloud-based systems available today for creating and deploying chatbots, including Microsoft Bot Framework and many more, however all of these methods have some disadvantages, such as integrated artificial intelligence, natural language processing, etc. This study compares all cloud-based chatbot solutions while keeping in mind limitations like built-in AI, setup and finish times, complexity, and others. Eventually, we will learn from the comparison whether cloud platform is effective and appropriate for constructing chatbots.

Facebook chatbot for Health Information on HIV/AIDS:
We demonstrate the use of an autonomous chatbot that is installed on Facebook and provides responses to numerous inquiries about HIV/AIDS and sexual health. To give users trustworthy information, the chatbot's response database is built from expert medical and public health sources. To our knowledge, this is the first retrieval-based chatbot to be implemented on a significant public social network. The system's backend is NPCEditor, a response selection platform trained on connected questions and replies.

A survey on web conversational BOT design:
Human-Computer The use of speech for computer interface is growing. Discourse-based web crawlers and assistants, like Siri, Google Chrome, and Cortana, have recently become more prevalent. NLP techniques, such as NLTK for Python, can be used to decipher speech, and responses can be discovered by designing an engine to provide relevant human-like responses. The focus of this study is a Chatbot, a type of project of this nature. This paper offers a study on the methods used to create chatbots and compares various configuration systems from thirteen carefully selected papers according to the main methods employed. These papers provide as examples of the significant advancements made in chatbots during the past ten years.

Sanative Chatbot For Health Seekers:
Nowadays, consumers are more likely to look for knowledge or information online about health-related topics through online healthcare services. This system's primary goal is to overcome the language gap between patients and healthcare professionals by providing quick responses to questions asked by patients. Because they are dependable and offer immediate responses, autogenerated material for the healthcare industry is preferred to conventionally generated systems. What needs to be done to address the issue is a significant issue taken into account here. The inputs to the system are recognised and the system is seen as a whole. The analyst has a clear concept of what has to be done once analysis is complete. This article suggests a method for coding medical records that combines local mining with global strategies. By removing the medical ideas from each individual record and then mapping them to terminologies based on external authorised vocabularies, local mining tries to code the medical records. Global learning spreads precise terminologies among underlying related records in a big collection and seeks to learn missing important concepts.

Pharmabot - a pediatric generic medicine consultant chatbot :
In the study, a chatbot paediatric generic medicine consultant named Pharmabot is introduced. It is a conversational chatbot that can recommend, prescribe, and provide details about generic medications for kids. In the study, a computer program is introduced that serves as a medicine consultant for patients or parents who are uncertain about generic medications. In order to get the intended outcome in their study, the researchers employ Left and Right Parsing Algorithm.

3.METHODOLOGY

When patients are requested to fill out forms or respond to a set of questions using a prepared set of answers, they may experience a dehumanising interaction. Patients get more frustrated as a result since they are unable to completely convey their feelings, concerns, and sufferings. By the use of chatbots, patients can feel more at ease by avoiding the bias inherent in machine interactions. A third of all fatalities are attributable to cardiovascular disease (CVD), which is a primary cause of death worldwide. Early risk assessment is essential for CVD prevention. Several prediction models have been created over the past 20 years. Yet, each of these models had its own flaws and drawbacks. Thus, it was imperative to create a trustworthy heart disease prediction system.

Drawbacks:
1. The replies given existing forms and applications are dehumanized and robotic.
2. The data trained in existing system can be faulty or not verified.
3. These old mode of query solving solutions take time to find the answers to the queries of the users.
4. The accuracy is low.

In this paper, we are creating a CHATBOT application that enables expectant mothers to receive clarification on any questions they may have. This project was created using the NLP (natural language processing toolset) and the LSTM machine learning algorithm (Long Short Term Memory). LSTM will be trained with all potential questions and answers, and whenever a user asks a question, LSTM will anticipate an answer and give it to the chatbot so that the user may see it. A third of all fatalities are attributable to cardiovascular disease (CVD), which is a primary cause of death worldwide. Early risk assessment is essential for CVD prevention. Several prediction models have been created over the past 20 years. Yet, each of these models had its own flaws and drawbacks. To help people predict their medical conditions, it was therefore imperative to design a trustworthy heart disease prediction model with high accuracy. While there was no publicly accessible dataset for training LSTM, we collected some questions and answers about pregnancy from the internet and saved them all as a dataset.

Advantages:
1. Assistance on time from any place.
2. Chatbot helps to get answers quickly in a humanoid way.
3. All the data set trained to the bot will be cross checked to avoid spreading wrong/fake answers.
4. Chatbot will be active every minute of the clock to help in query solving
5. The feedback given by the bot will be similar to that off a doctor, as well we are going to only use dataset that verifies by doctors

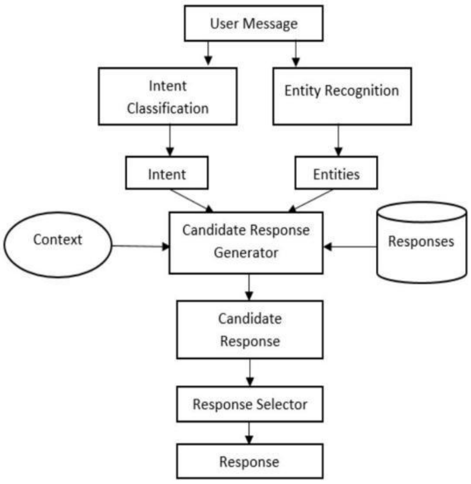


Fig.1: System architecture

MODULES:
We developed the modules listed below in order to carry out the aforementioned project.

- Tke the input from the user
- Analyze the users input given to the chatbot
- Identify the Internts and Entities
- Find the accurate solution from the Database
- Compose the solution in humanoid manner
- Display the solution to the user

4.IMPLEMENTATION

Long Short Term Memory algorithm:
A recurrent neural network called an LSTM network uses LSTM cell blocks rather than the typical neural network layers. The input gate, forget gate, and output gate are three different parts of these cells. RNNs are adept at handling sequential data, but they struggle with distant context. Intentionally, LSTMs are created to prevent the long-term reliance issue. The problem of the Vanishing/Expanding Gradient is likewise solved using LSTMs. They don't struggle to learn; rather, remembering information for extended periods of time is basically their default behaviour. All recurrent neural networks have the shape of a series of neural network modules that repeat. This recurring module in typical RNNs will be made up of just one tanh layer, for example. Bidirectional recurrent neural networks (BRNNs) work on the principle of feeding each training sequence into two independent recurrent nets, both of which are connected to the same output layer. (In

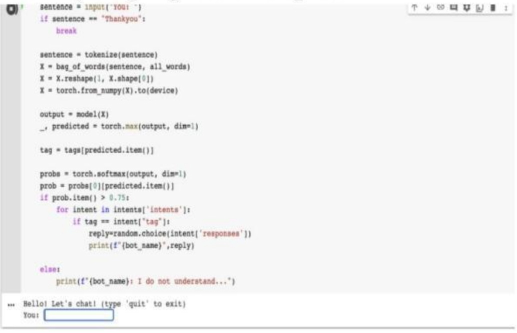
certain circumstances a third network is used in place of the output layer, but here we have used the simpler model). This implies that the BRNN has comprehensive, sequential knowledge of all points before and after each point in a given sequence. Moreover, there is no need to identify a (task-dependent) time-window or goal delay size because the net is free to use as much or as little of this context as is required. An LSTM has a hidden state, similar to a simple RNN, with H(n-1) standing for the hidden state of the prior timestamp and Ht for the hidden state of the present timestamp. Moreover, the LSTM has a cell state that is denoted by C(n-1) and C(n), respectively, for the prior and present timestamps. Here, the cell state is referred to as Long Term Memory, while the hidden state is referred to as Short Term Memory. The primary distinction between LSTMs and RNNs may be noticed in the fact that the gated unit or cell is the hidden layer in LSTMs. It has four layers that interact with one another to produce the cell's output and state. Both of these are carried over to the following layer. In contrast to RNNs, which have a single Tanh-based neural net layer, LSTMs have three logistic sigmoid gates in addition to a Tanh layer.

The idea behind the LSTM architecture is to add a module that learns when to remember and when to forget important information to a neural network. To put it another way, the network efficiently learns which pieces of information might be needed later on in a sequence and when those pieces of information are no longer required. For instance, the network can learn grammatical connections in the context of natural language processing.

Natural Language Processsing:

The chatbot must be able to comprehend the sender's objectives, decide whether a follow-up question or a direct response is necessary, and adhere to proper grammatical and lexical rules when creating the response. Certain models might make use of extra meta data from the data, like speaker id, gender, and emotion. Sentiment analysis is sometimes used to give a chatbot the ability to "understand" the user's mood by examining language cues and phrase structure. Virtual agents that are NLP-powered and part of the current generation of chatbots continually learn new things. Throughout the dialogue, they maintain notes and pick up new information. Your virtual agent should be configured as simply as possible, with the features you require—but no more—to get the most out of it. Of course, there is always the option to upgrade or add new features as necessary in the future.

The NLU unit is in charge of translating the user's speech into a specified semantic frame in accordance with the system's standards, or in other words, into a format that the system can understand. Intent detection and slot filling are tasks included in this. For instance, intent could be a greeting, such as Hello, Hi, or Hey, or it could be informational, such as I adore Indian food, where user is providing more details. The actor's name, cost, start time, destination city, and other details of slots may be significantly varied depending on the customers' desires. As we can see, the intents and slots define Chatbot's closed-domain characteristics. However, NLG based on a semantically controlled LSTM recurrent network can learn from unaligned data by jointly optimising its surface realisation and sentence planning components using a simple cross entropy training criterion without any heuristics, and good quality language variation is obtained simply by randomly sampling network outputs.



```
sentence = input("You: ")
if sentence == "Thankyou":
    break

sentence = tokenize(sentence)
X = bag_of_words(sentence, all_words)
X = X.reshape(1, X.shape[0])
X = torch.from_numpy(X).to(device)

output = model(X)
_, predicted = torch.max(output, dim=1)

tag = tags[predicted.item()]

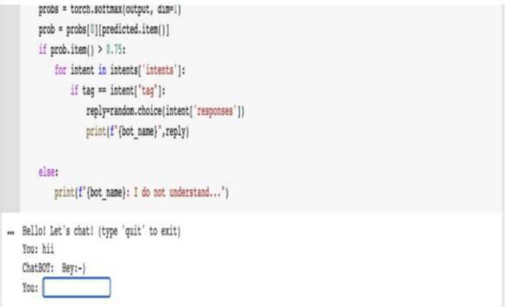
probs = torch.softmax(output, dim=1)
prob = probs[0][predicted.item()]
if prob.item() > 0.75:
    for intent in intents['intents']:
        if tag == intent["tag"]:
            reply=random.choice(intent['responses'])
            print(f"{bot_name}",reply)

else:
    print(f"{bot_name}: I do not understand...")
```

```
... Hello! Let's chat! (type 'quit' to exit)
    You:
```

Fig.2: implementation

4. EXPERIMENTAL RESULTS



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        if tag == intent["tag"]:
            reply=random.choice(intent['responses'])
            print(f"{bot_name}",reply)


else:
    print(f"{bot_name}: I do not understand...")
```
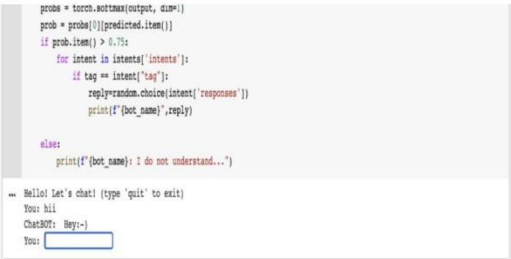

```
... Hello! Let's chat! (type 'quit' to exit)
    You: hii
    ChatBOT:  Hey:-)
    You:
```

Fig.3: Chat bot execution



```
probs = torch.softmax(output, dim=1)
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if prob.item() > 0.75:
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else:
    print(f"{bot_name}: I do not understand...")
```
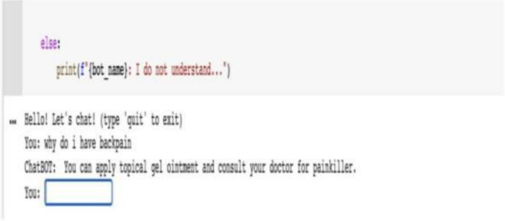

```
Hello! Let's chat! (type 'quit' to exit)
You: hii
ChatBOT:  Hey:-)
You:
```

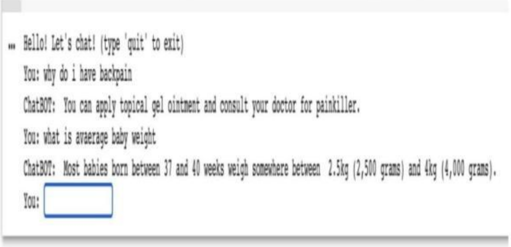
Fig.4: Chat bot greeting response



```
else:
    print(f"{bot_name}: I do not understand...")
```

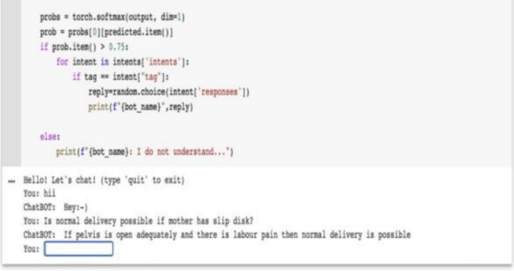
```
Hello! Let's chat! (type 'quit' to exit)
You: why do i have backpain
ChatBOT:  You can apply topical gel ointment and consult your doctor for painkiller.
You:
```

Fig.5: Chat bot greeting response



```
Hello! Let's chat! (type 'quit' to exit)
You: why do i have backpain
ChatBOT:  You can apply topical gel ointment and consult your doctor for painkiller.
You: what is avaerage baby weight
ChatBOT:  Most babies born between 37 and 40 weeks weigh somewhere between  2.5kg (2,500 grams) and 4kg (4,000 grams).
You:
```

Fig.6:Screenshot of reponse to query



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prob = probs[0][predicted.item()]
if prob.item() > 0.75:
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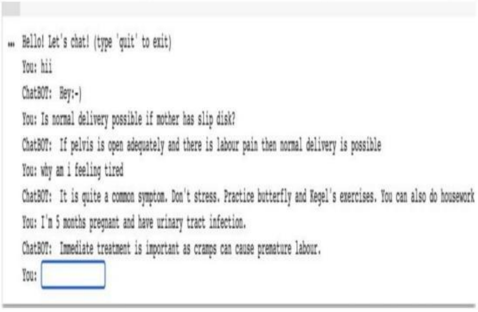
else:
    print(f"{bot_name}: I do not understand...")
```

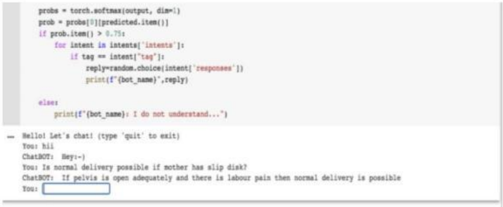
```
Hello! Let's chat! (type 'quit' to exit)
You: hii
ChatBOT:  Hey:-)
You: Is normal delivery possible if mother has slip disk?
ChatBOT:  If pelvis is open adequately and there is labour pain then normal delivery is possible
You:
```

Fig.7:Screenshot of reponse to query



```
Hello! Let's chat! (type 'quit' to exit)
You: hii
ChatBOT:  Hey:-)
You: Is normal delivery possible if mother has slip disk?
ChatBOT:  If pelvis is open adequately and there is labour pain then normal delivery is possible
You: why am i feeling tired
ChatBOT:  It is quite a common symptom. Don't stress. Practice butterfly and Kegel's exercises. You can also do housework
You: I'm 5 months pregnant and have urinary tract infection.
ChatBOT:  Immediate treatment is important as cramps can cause premature labour.
You:
```

Fig.8:Screenshot of reponse to query



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if prob.item() > 0.75:
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    print(f"{bot_name}: I do not understand...")
```

```
Hello! Let's chat! (type 'quit' to exit)
You: hii
ChatBOT:  Hey:-)
You: Is normal delivery possible if mother has slip disk?
ChatBOT:  If pelvis is open adequately and there is labour pain then normal delivery is possible
You:
```

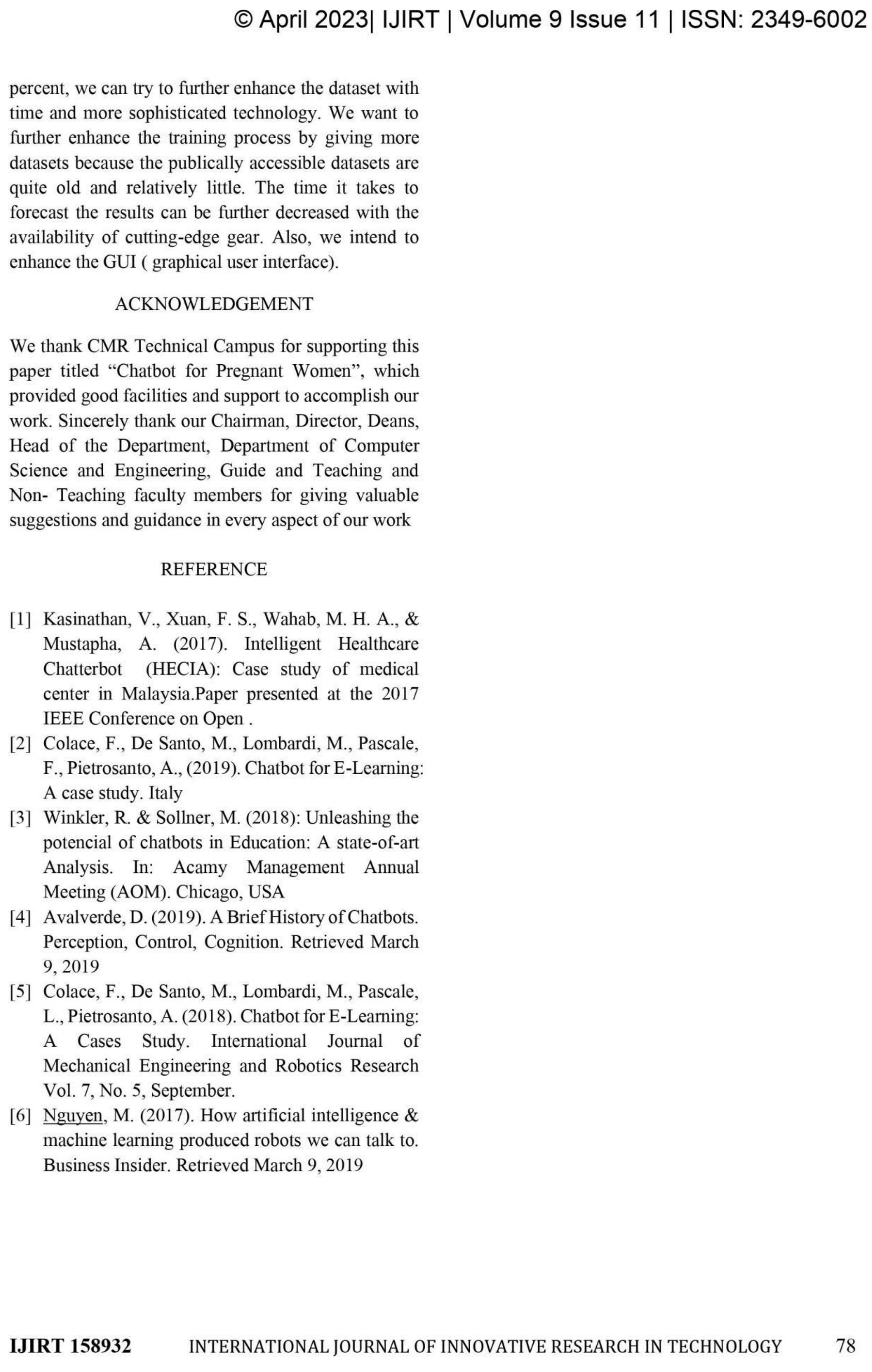
Fig.9:Screenshot of reponse to query

5. CONCLUSION

In this study, a Charbot for Pregnant Womes was suggested. Medical services are basic needs for human life although they normally have limited resources. Modern technologies are utilized for increasing service capability and decreasing the operation cost. Auto-response system or chatbot, which is widely known in the field of online businesses, can be applied to the medical services. Therefore, the objective of this work is to implement the medical consultant system service by using chatbot Technology One of the top three mobile trends in the US is healthcare. According to a recent research, US consumers who own smartphones or other wireless devices have at least one health/fitness app on their phones (up 13% in the last two years), and in general, health apps receive some of the most downloads. A smartphone app would be used by two-thirds of women to address health-related issues. In particular, we describe an application scenario for an AI-chatbot delivering support to pregnant women, mothers, and families with young children, by giving them help and instructions in relevant situations. The review comes to a close with a conclusion that examines the objectives and research questions, summarises the major points of the debate, and lists the solutions that were discovered. The research objective was to further the creation of healthcare chatbots by examining and compiling the existing studies. This would be accomplished by determining the chatbot's potential applications in the healthcare sector and whether it could function independently or whether additional technology was needed to add pedagogical value to schooling.

6.FUTURE WORK

The major goal of our product is to serve a large audience globally, hence we would like to update the chabot by making it more linguistically compatible. Even although our project's accuracy is close to 100



percent, we can try to further enhance the dataset with time and more sophisticated technology. We want to further enhance the training process by giving more datasets because the publically accessible datasets are quite old and relatively little. The time it takes to forecast the results can be further decreased with the availability of cutting-edge gear. Also, we intend to enhance the GUI (graphical user interface).

ACKNOWLEDGEMENT

We thank CMR Technical Campus for supporting this paper titled “Chatbot for Pregnant Women”, which provided good facilities and support to accomplish our work. Sincerely thank our Chairman, Director, Deans, Head of the Department, Department of Computer Science and Engineering, Guide and Teaching and Non- Teaching faculty members for giving valuable suggestions and guidance in every aspect of our work

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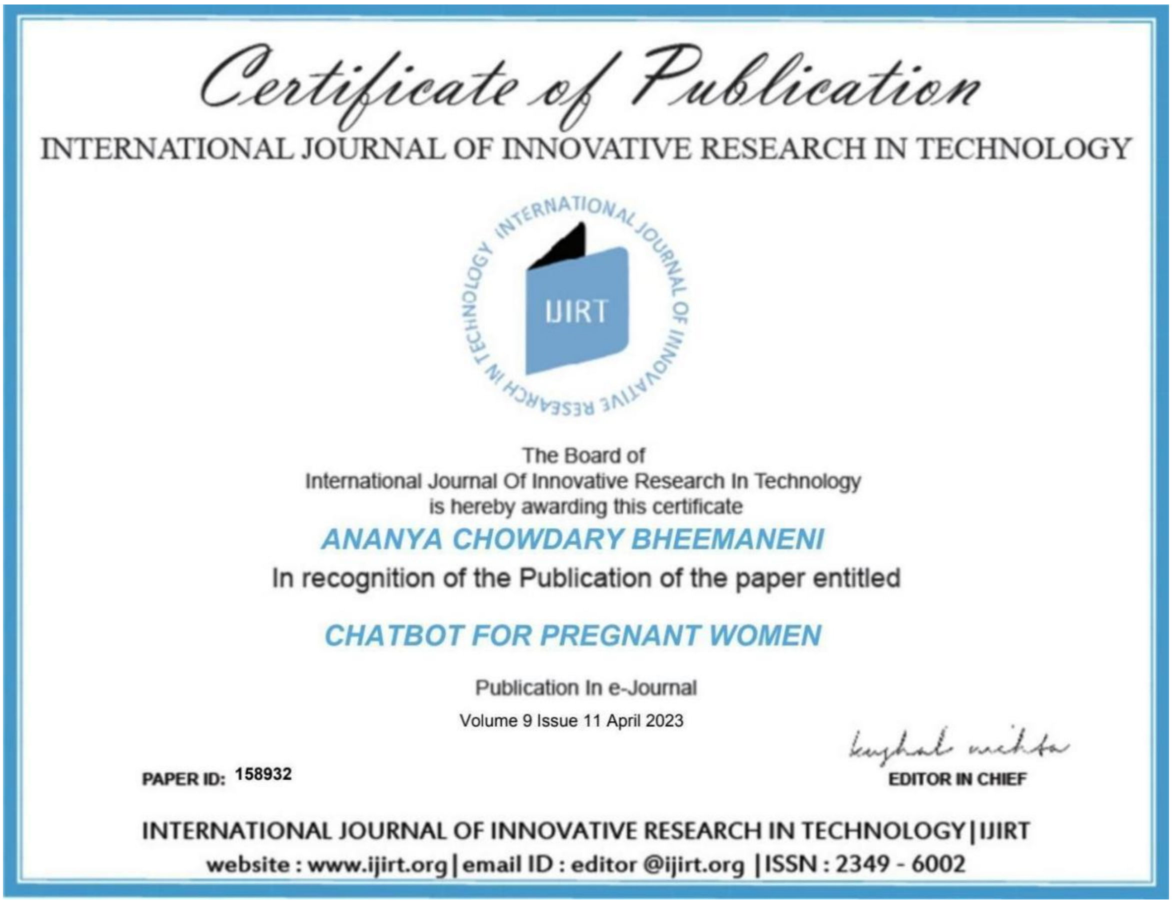
11.CERTIFICATES



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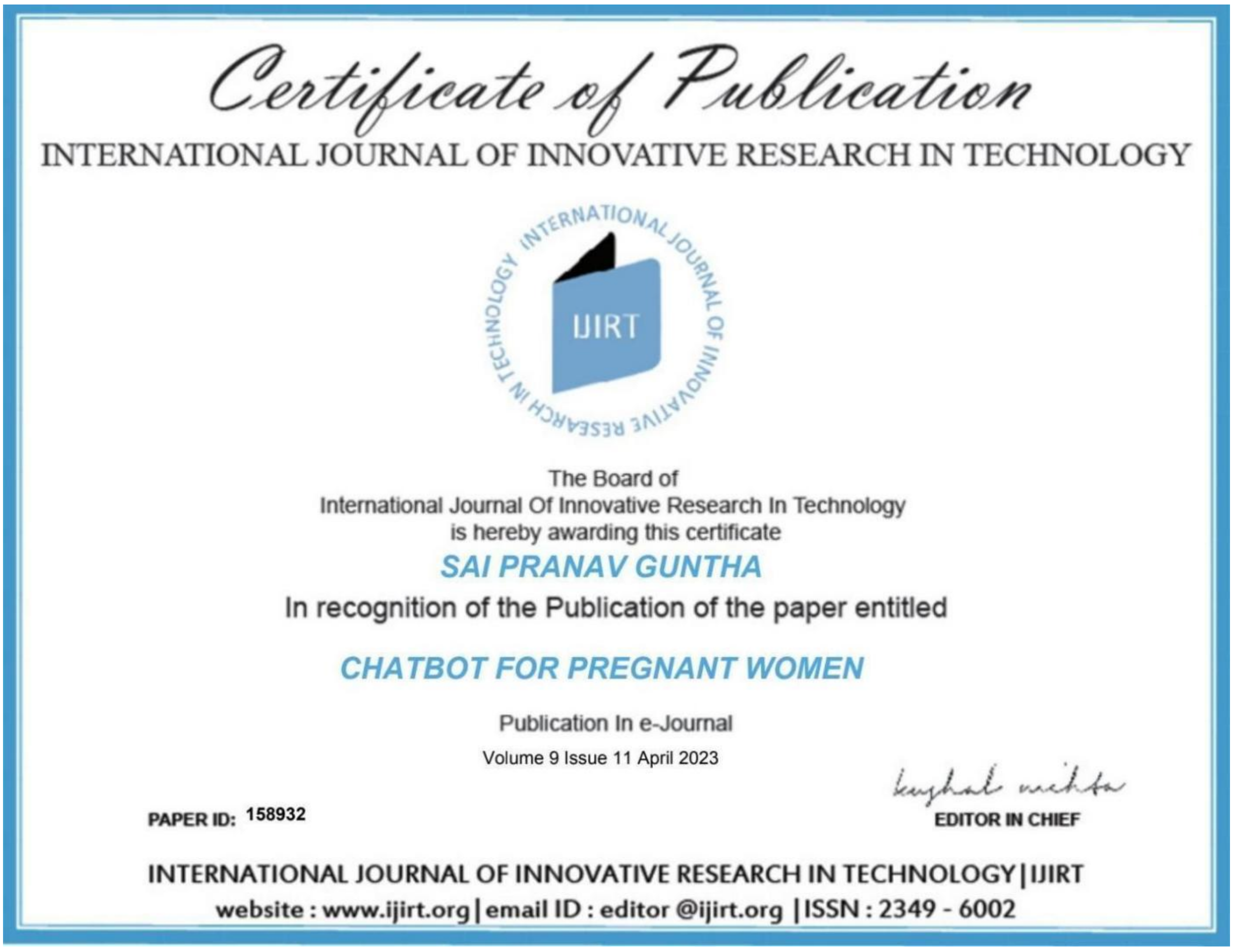

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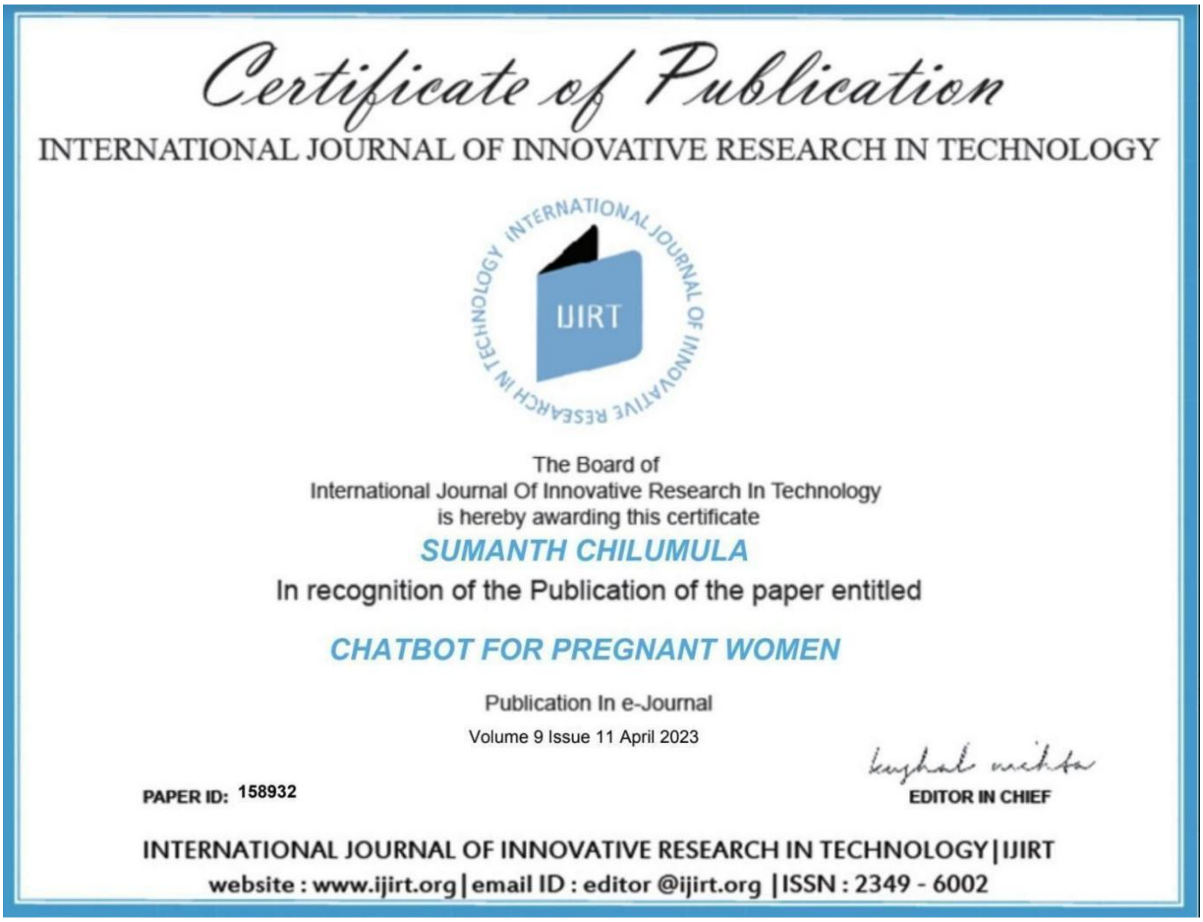

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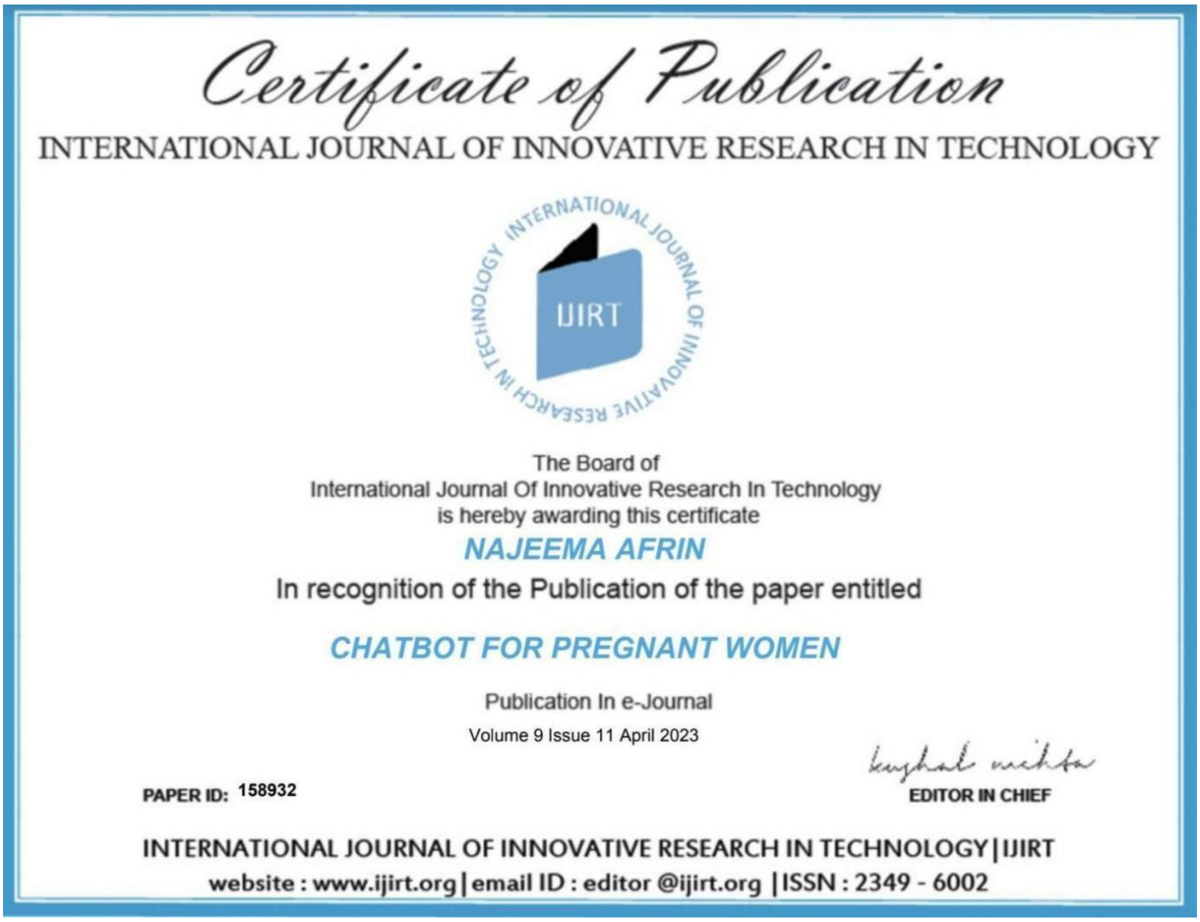

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