INSTITUTE FOR ADVANCED

COMPUTING AND

SOFTWARE

DEVELOPMENT

AKURDI, PUNE

PROJECT REPORT

ON

“Chatbot-Hotel-Booking”

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Submitted By:

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ACKNOWLEDGEMENT

This project **'Chatbot-Hotel-Booking'** was a great learning experience for us and we are submitting this work to, Institute for Advanced Computing and Software Development.

We all are very glad to mention the name of Dr. Shantanu Pathak for his valuable guidance to work on this project. The guidance and support from him helped us to overcome various obstacles and intricacies during the course of project work.

Our most heartfelt gratitude goes to Mr. Rohit Puranik (Centre Coordinator) who gave us all the required support and coordinated with us to provide all the necessities we needed to complete the project and throughout the course up to the last day here in IACSD, Akurdi.

From

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1. INTRODUCTION

Chatbots, or conversational interfaces as they are also called, introduce a new way for people to interact with computer systems. Traditionally, to get an answer to a question using software, you would use a search engine or fill out a form. A chatbot allows a user to simply ask questions the same way they would to a human. The most popular chatbots today are voice chatbots: Alexa and Siri. However, chatbots are currently being adopted at a high rate on online chat platforms. The chatbot is a computer program that humans will interact with in a natural spoken language and includes artificial intelligence techniques such as NLP (natural language processing) that makes the chatbot more interactive and trustworthy. Deep learning chatbots are powered by artificial intelligence. The user doesn't need to be more specific when talking to a bot because it can understand natural language, not just commands. These types of bots get better and smarter as they learn from past conversations they've had with people. Here is a simple example that illustrates how they work.

Rasa is an open-source machine learning framework for building Artificial Intelligent assistants and chatbots. In general, you don't need any programming language experience to work in Rasa. Although there is something called "Rasa Action Server" where you have to write code in Python, which is mainly used to trigger external actions like calling Google API or REST API etc.

1.1 PROBLEM STATEMENT

Chatbot-Hotel-Booking.

1.2 ABSTRACT

Chatbot is a computer program which is made in such a way than can understand human language. Chatbots can simulate the human conversation that usually found in call center or service center by using natural language processing to adapt the responses to fit in the following situation. Nowadays, chatbots can be found in e-commerce websites and social messaging services in order to help human if someday they need service that concerned to following websites such as for reservation or call center. The chatbot we use is built using RASA and RASA CORE, RASA is an open-source machine learning framework to automate text and speech.

1.3 OBJECTIVE

The aim of this project is to book hotel using chatbot, the chatbot should be able to respond user questions. Chatbot is a computer program which is made in such a way than can understand human language. Chatbots can simulate the human conversation that usually found in call center or service center by using natural language processing to adapt the responses to fit in the following situation. Nowadays, chatbots can be found in e-commerce websites and social messaging services in order to help human if someday they need service that concerned to following websites such as for reservation or call center. Therefore, the aim of this project is to book hotel using chatbot, the chatbot should be able to respond user questions.

1.4 SCOPE OF THE PROPOSED WORK

The main use of this chatbot, chatbot is a computer program which is made in such a way than can understand human language. Chatbots can simulate the human conversation that usually found in call center or service center by using natural language processing to adapt the responses to fit in the following situation. Nowadays, chatbots can be found in e-commerce websites and social messaging services in order to help human if someday they need service that concerned to following websites such as for reservation or call center.

2. SOFTWARE AND HARDWARE REQUIREMENT

- OS – Windows 7, 8 and 10 (32 and 64 bit)
- RAM – 8GB 3.2 SOFTWARE
- Python 3.10.9
- Tensorflow
- RASA 3 Library
- Anaconda3

3. WORKFLOW OF PROJECT

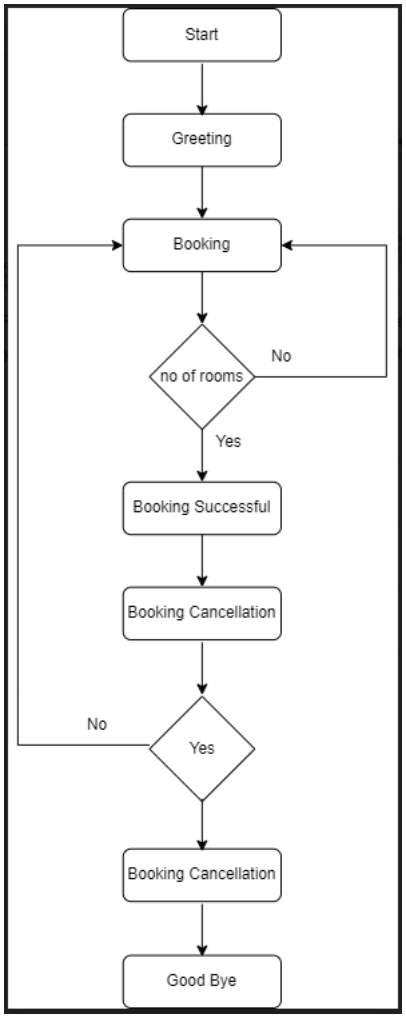


Figure 1 Workflow Diagram

4. System Architecture:

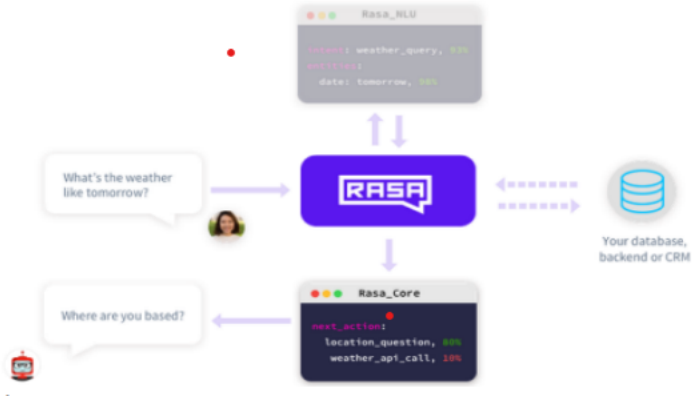


Figure 2 System Architecture

4.1 Rasa has two main components:

Rasa NLU (Natural Language Understanding) :

Rasa NLU is an open-source natural language processing tool for intent classification (deciding what the user is asking for), extraction of the entities by bot in the form of structured data helps the chatbot understand what the user is saying.

Rasa Core (for holding conversation and deciding what to do next):

Rasa Core is a machine learning-based dialog management chatbot framework that takes the structured input of the NLU and predicts the next best action using a probabilistic model such as LSTM neural network instead of if/else statement. Under the hood it also uses reinforcement learning to improve the prediction of the next best action

5. Use case diagram:

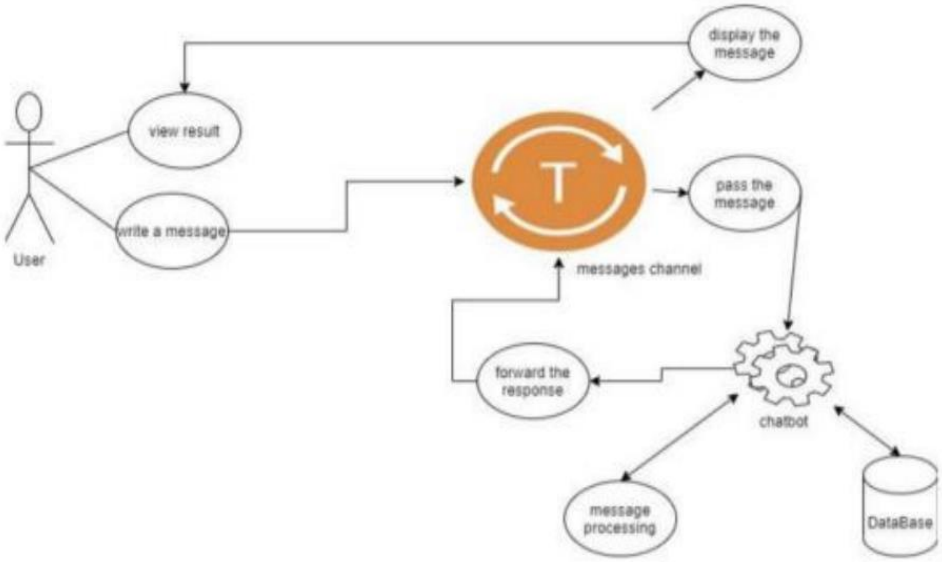


Figure 3 Use case diagram

6. Sequence diagram:

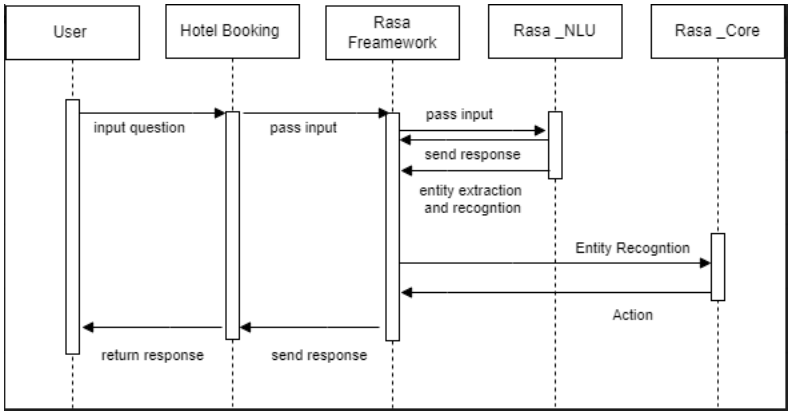


Figure 4 Sequence diagram.

7. State diagram

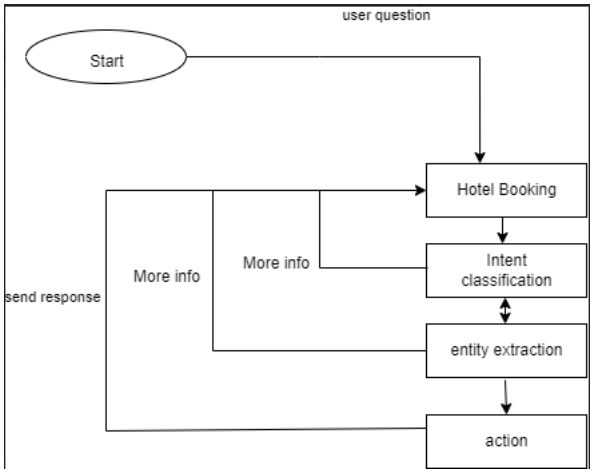


Figure 5 State diagram

8. Chatbot Capabilities

All chatbots are made by using natural language processing (NLP) of RASA. Rasa is an open-source machine learning framework to automate text and voice-based conversations. NLP is the main point of chatbot. By using NLP, chatbot can be able to process human language and give feedback according to the input from human or user. Some of NLP capabilities as follows:

- Room Booking
- Handle Greetings.
- Booking Cancellation
- Question answering.
- Machine translation.

In this project, the hotel reservation chatbot has some NLP capabilities in order to process input that comes from the user to get the information from the user.
The kind of information is same as when user input their information regarding to the: following reservation questions. Moreover, user do not need to navigate the reservation website even input their information; only use chatbot, chatbot will give some question regarding to the reservation, instead of navigating, user just answer the questions like normal chatting activity. This is one of the chatbot benefits, practical and efficient as well.

9. System Implementation

Rasa is an open-source machine learning framework for building Artificial Intelligent assistants and chatbots. In general, you do not need any programming language experience to work in Rasa. Although there is something called "Rasa Action Server" where you must write code in Python, which is mainly used to trigger external actions like calling Google API or REST API etc.

This Project contains two major modules they are:
1. Administrator Module
2. Customer Module

9.1 Administrator Module:

The administrator is responsible for adding the different intents. The admin can do the different actions some of them are:

- Adding Stories
- Editing Stories
- Delete Stories

9.2 Customer Module:

The Customer can interact with the chatbot using Rasa shell. If the customer implements the custom webpage, then it should be run on the localhost and the port number should be different from one which is running actions of rasa.

9.3 Chatbot Specification:

For this project, the chatbot specifications as follows:
- Chatbot name: Hotel Booking.
- Programming language: Python programming language.
- Additional NLP tool: Rasa

9.4 Conversation Model:

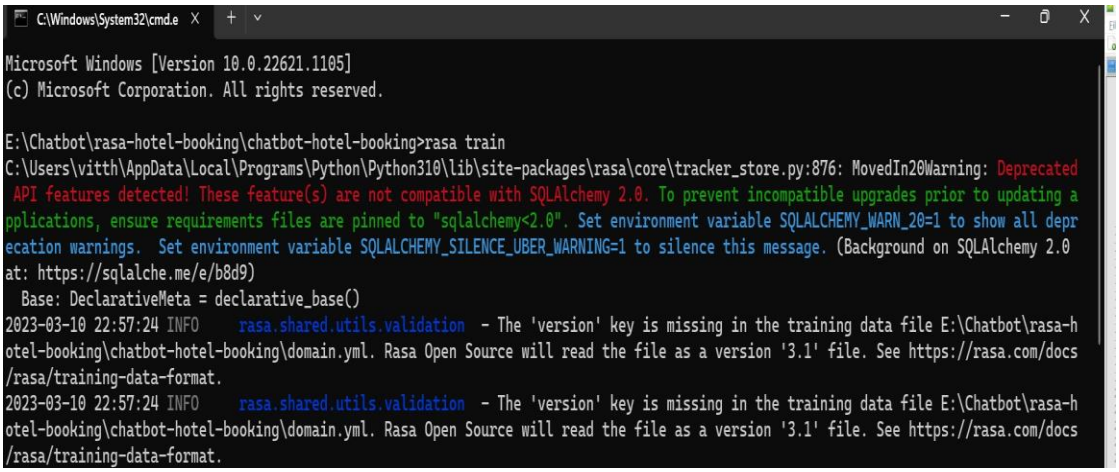
The conversation model will be separated into some parts. Each part has its own kind of conversation. Some parts are:
- Greeting.
- Booking.
- Restaurant facility.
- Booking cancellation.

10. Result and Output

The Rasa chat-bot implements the stories mechanism and follows the story when we are interacting with them.

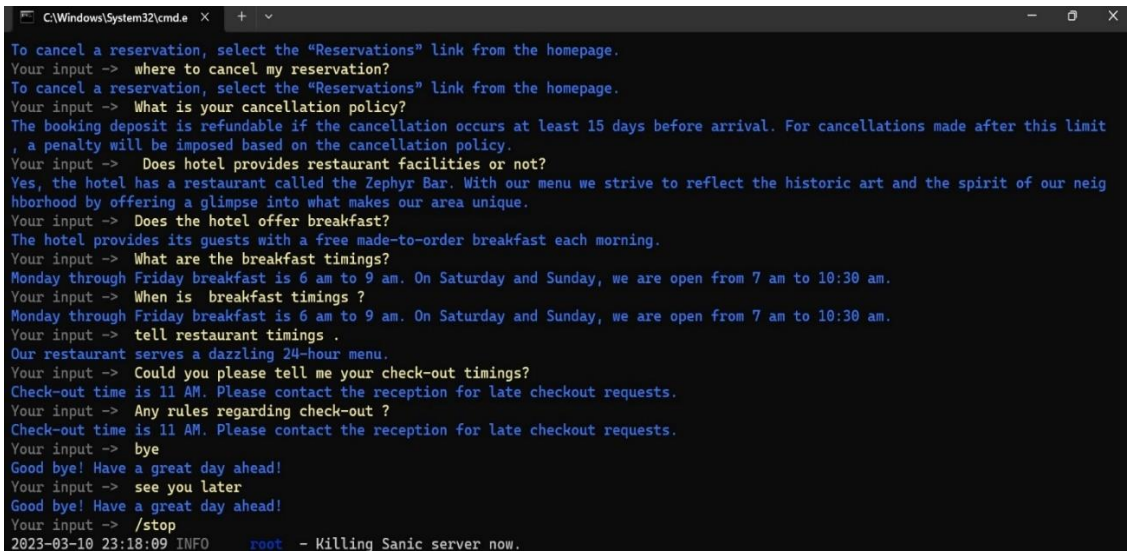
10.1 Run command – rasa train:

Trains a model using your NLU data and stories, saves trained model in ./models.



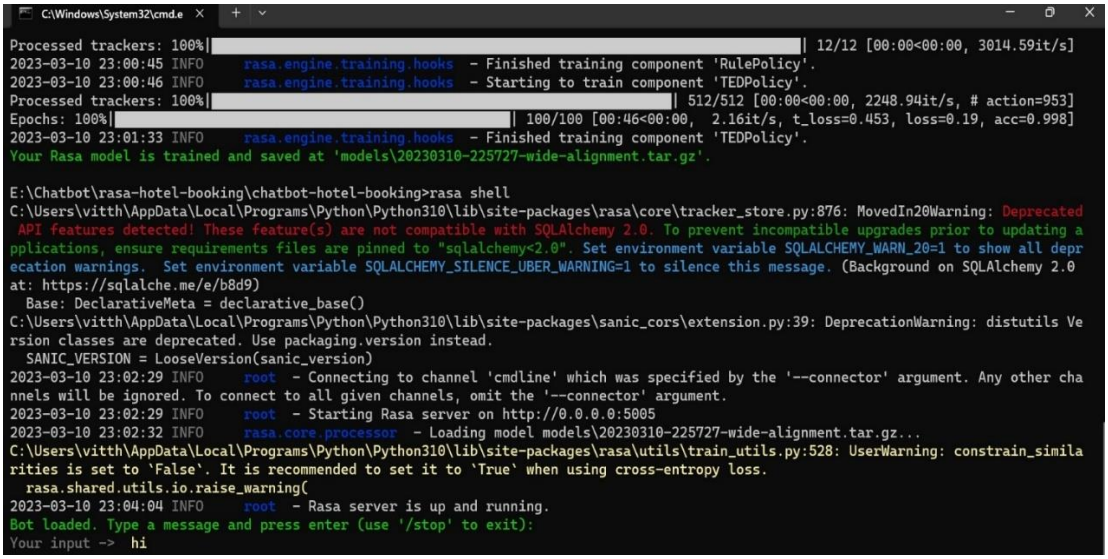
10.2 Run command – rasa shell:

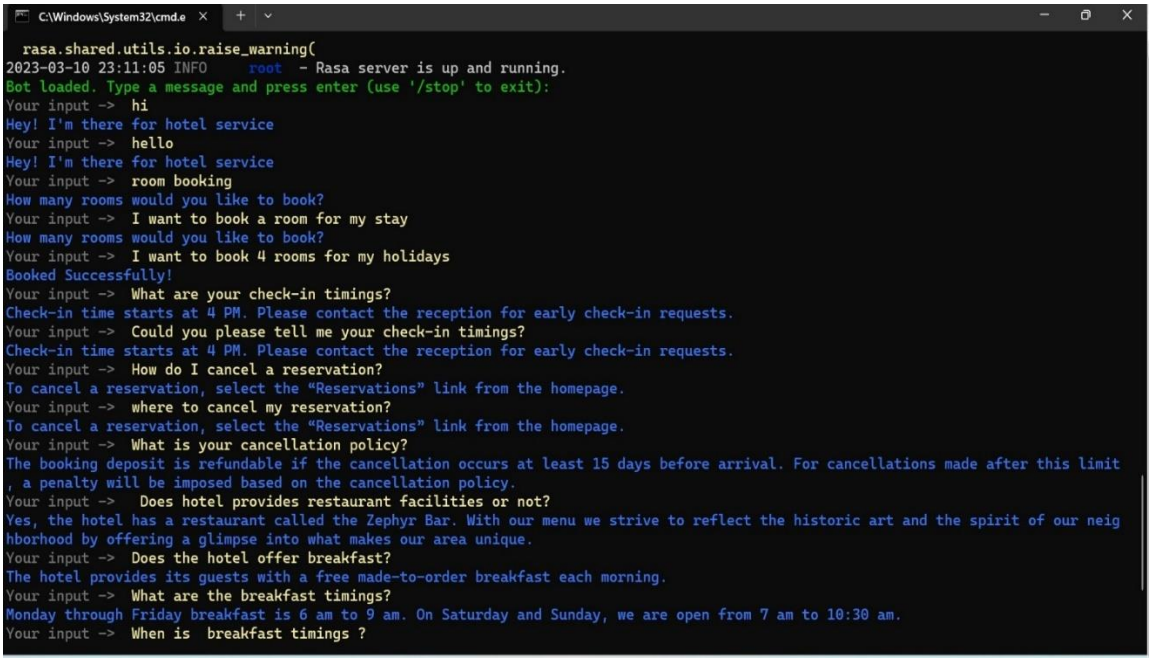
Loads your trained model and lets you talk to your assistant on the command line.



10.3 Enter greetings:

Bot will respond with greetings. A welcome message's is the first interaction between the chatbot and the users





11. Rasa Configuration

1. Install Python 3.10.9

2. Install Anaconda 3

3. After installing Anaconda, follow below commands to create a virtual environment in conda. This will allow you to run Rasa without errors.

4. Create Anaconda environment

steps:1. conda create -n environment_name python=3.10.9

steps:2. conda activate environment _name

5. Open command Prompt and navigate to project path

6. Run command – rasa train

7. To interact with the chatbot in the terminal run command – rasa shell

8. nlu.yml: your NLU training data. Here you can define Intent. Like Order Pizza or Book Uber. You need to add related Sentences for that Intent. Remember if you are using Rasa, your training Intent and Data will be added automatically.

9. domain.yml: your assistant's domain. This file combines Different Intent which chatbot can detect and list of Bot replies. Remember you can define your Custom Action Server Python method name here (in underscore format), so that Rasa will call that python method for you.

10.Stories.yml: This is required for Rasa Core. There is something called "Dialog Flow in Rasa" where Rasa Core controls the flow of the conversation between you and chatbot, so for that flow, you need to train chatbot using these stories. So, in case you want your chatbot to be very perfect on different context (stories) you can add those stories here.

12. Conclusion

Chatbots is an effective way if implemented carefully. Chatbots are the forms of automation and they would replace human agents because chatbots are fast and never get tired compared to human agents can get fatigued or overwhelmed. Thus, many people try to make chatbot for their company for customer service purpose in order to serve their customers 24 hours with zero mistake, while human agents cannot do. The most important is chatbots make it easier to get closer to customers and they will serve the customers with fast response.

From this simple hotel booking bot, the required NLP capabilities are less than the complex one. Complex chatbot need more NLP capabilities in order to make it reliable and works as same as human agent. For future works, this hotel booking bot should be able to connect to online data in order to query the name and price of accommodation according to the location.

13. Future scope

For future works, this hotel reservation bot should be able to connect to online data in order to query the name and price of accommodation according to the location.

This bot will be integrated with hotel booking website with more interactive responses and provide FAQ support and will provide cleaning intent support for more effectiveness.

14. Project Link

- https://github.com/sujatashriram/chatbot-hotel-booking

15. References

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