CHATBOT

A

Project Report

Submitted in the fulfilment of the requirements for the completion

Of

Internship on Building Action Chatbot

By:

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CANDIDATES DECLARATION

We hereby certify that the project work entitled Action Oriented Chatbot in fulfillment of the requirements for the completion of the Internship on Building Chatbot and submitted to the Department of Information Systems, Hindustan Petroleum Corporation Limited, Hyderabad, is an authentic record of our work carried out during a period from 1st May 2020 to 30th June 2020 under the supervision of **Mr. Ashutosh Singh** , Senior Data Science Consultant , Information System Department. The matter presented in this project has not been submitted by us for the award of any other degree of this or any other university.

Since the data presented in this project is confidential, hence, we are not specifying the name of any tool used by the Organization, any details of the employees of the Organization, or any type of data that may be critical for the Organization.
Also, some of the outputs have been blurred which was crucial to the Organization.

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Name of the Student ROHIT SINGH YADAV
Roll No. R970217033

Date: 3/8/2020

ACKNOWLEDGEMENT

We wish to express our deep gratitude to our guide **Mr. Ashutosh Singh**, for all advice, encouragement, and constant support he has given us throughout our project work. This work would not have been possible without his support and valuable suggestions.

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We would like to thank all our friends for their help and constructive criticism during our project work. Finally, we have no words to express our sincere gratitude to our parents who have shown us this world and for every support, they have given us.

Name of Student(s) Rohit Singh Yadav
Roll No. R970217033

ABSTRACT

Chatbots, or conversational interfaces as they are also known, present a new way for individuals to interact with computer systems. Traditionally, to get a question answered by a software program involved using a search engine, or filling out a form. A chatbot allows a user to simply ask questions in the same manner that they would address a human. The most well known chatbots currently are voice chatbots: Alexa and Siri. However, chatbots are currently being adopted at a high rate on computer chat platforms.

The technology at the core of the rise of the chatbot is natural language processing ("NLP"). Recent advances in machine learning have greatly improved the accuracy and effectiveness of natural language processing, making chatbots a viable option for many organizations. This improvement in NLP is firing a great deal of additional research which should lead to continued improvement in the effectiveness of chatbots in the years to come.

A simple chatbot can be created by loading an FAQ (frequently asked questions) into chatbot software. The functionality of the chatbot can be improved by integrating it into the organization's enterprise software, allowing more personal questions to be answered, like"What is my balance?", or "What is the status of my order?".

Most commercial chatbots are dependent on platforms created by the technology giants for their natural language processing. These include Amazon Lex, Microsoft Cognitive Services, Google Cloud Natural Language API, Facebook DeepText, and IBM Watson. Platforms where chatbots are deployed include Facebook Messenger, Skype, and Slack, among many others.

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ABOUT THE ORGANIZATION

HPCL is a Maharatna CPSE. It had originally been incorporated as a company under the Indian Companies Act 1913. It's CIN No. L23201MH1952GOI008858.
It is listed on the Bombay Stock exchange (BSE) and National Stock Exchange (NSE), India.

HPCL owns & operates 2 major refineries producing a wide variety of petroleum fuels & specialties, one in Mumbai (West Coast) of 7.5 Million Metric Tonnes Per Annum (MMTPA) capacity and the other in Visakhapatnam, (East Coast) with a capacity of 8.3 MMTPA. HPCL also owns and operates the largest Lube Refinery in the country producing Lube Base Oils of international standards, with a capacity of 428 TMT. This Lube Refinery accounts for over 40% of India's total Lube Base Oil production. HPCL in collaboration with M/s Mittal Energy Investments Pte. Ltd. is operating an 11.3 MMTPA capacity Refinery at Bathinda with 48.99% equity and also holds equity of about 16.95% in the 15 MMTPA Mangalore Refinery and Petrochemicals Ltd.

HPCL has the second-largest share of product pipelines in India with a pipeline network of more than 3370 km for transportation of petroleum products and a vast marketing network consisting of 14 Zonal offices in major cities and 128 Regional Offices facilitated by a Supply & Distribution infrastructure comprising Terminals, Pipeline networks, Aviation Service Stations, LPG Bottling Plants, Inland Relay Depots & Retail Outlets, Lube and LPG Distributorships. Consistent excellent performance has been made possible by a highly motivated workforce of over 10,500 employees working all over India at its various refining and marketing locations.

HPCL is committed to achieving the economic, ecological & social responsibility objectives of sustainable development consistently through varied operations and activities. HPCL's focus areas are in the fields of Child Care, Education, Health Care, Skill Development & Community Development, touching the lives of the weaker section of society.[1]

Introduction

A chatbot is a conversational agent that interacts with users using natural language. Started as an attempt to fool humans.Numerous applications of chatbots such as Customer Service, call centers etc.

Today, Alexa lets us control our lights with voice, Google assistant suggests places we would want to go when we are discussing dinner plans with our friends and Tesla can drive for us. Siri and Cortana live inside our phones and take commands. Screenless conversations are expected to dominate. From ELIZA to Alice to Alexa, we have come a long way. Today, due to the penetration of social media and internet along with the progress in artificial intelligence, not only are bots coming up as a way to reach out to the users but also, they are making way for conversational interfaces such as Alexa to be omnipresent and go screenless. In the case of chatbots, with the launch of messenger bots and platforms such as slack, bots have gotten a boost. Facebook bots have grown from 34000 bots in November 2016 to 100,000 bots in April 2017.

As social media widens its penetration, companies will shift their focus to bots for reaching and serving users. This being because presence on a social media platform makes it easier for the user to access. It also means fewer resources to invest in for the company and the user. Users also do not have to deal with the hassle of downloading an app. They can just text the respective bot on their favored social media platform. It also means that the service is available 24/7. Had this been for a human employed customer service, it would cost way more to hire and train humans.

It would mean having people in multiple shifts to provide 24/7 service. Bots are not yet as accurate and understanding as humans but they can get the basic job done and when they are stuck, a human can always take over. Because of these benefits, bots are seen as a domain with huge potential for customer outreach and driving sales. However, most of the bots today are rule based bots that give the user a menu and the user navigates through the menu like telephonic complaint booking systems but in text. Secondly, most of the bots are closed domain bots meaning they are focused on one particular task and are trained for that field only. Alexa, Siri are examples of open domain bots. However, bots for restaurant booking are closed domain bots. Closed domain bots can be both, powered by artificial intelligence or be rule based. While the users expect open domain bots that are intelligent in all aspects, the goal of a bot system isn't just that. The goal of a bot system remains to automate a service using a conversational interface that allows the user to access the service from the platforms they frequently visit. This goes to say one mustn't be dissuaded from building a rule based bot that indeed works for the reason that the bot isn't intelligent like a super human. That being said, we must pursue building intelligent systems since the more intelligent they are in terms of understanding the end user, more will they be useful.

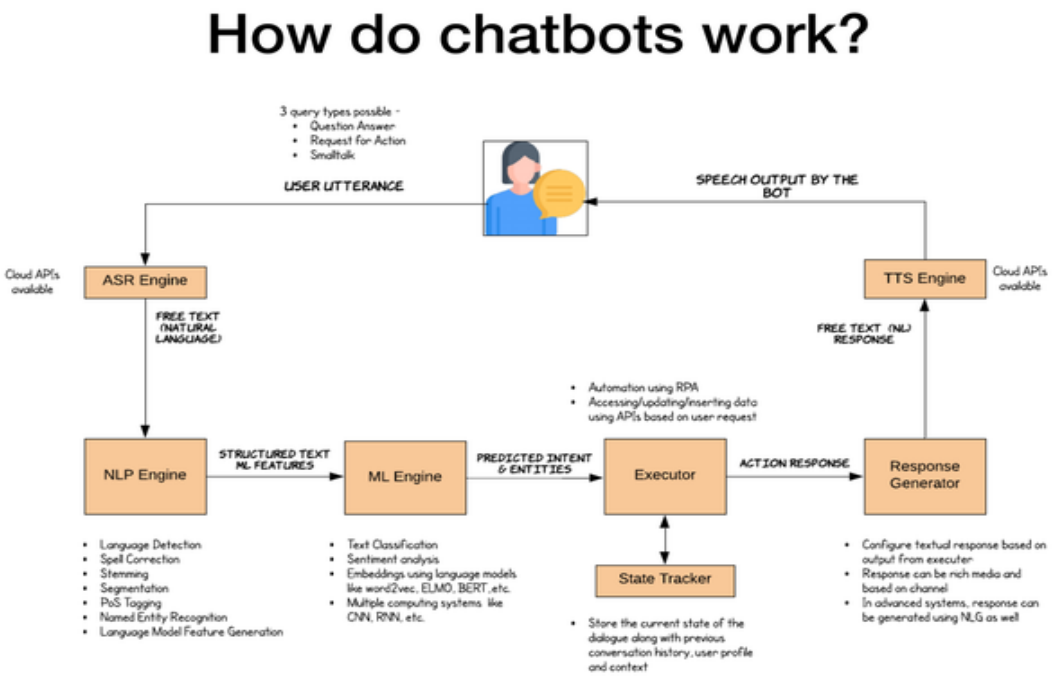


Figure-1

PROBLEM

- Before customer's faced the problems like for every query they had to do asked through email or phone call or message.
- Stores the information in a database so that if the same query arises again, it can use the information to form a more accurate response.
- Improved handling capacity & automation of featured e-commerce services.
- Instantly resolve customer issues.

OBJECTIVE

- Improving chatbot capacity by harnessing the power of Rasa-X.
- Apply docker-compose technology for deploymentation to the Rasa-X chatbot.
- Connect GitHub with Rasa-X server, So that rasa-X server will fetch the data from
- GitHub automatically as developers upload.

CHALLENGES

- How can run your bot on docker container technology.
- How to Launch the EC2 Instance on AWS.
- How to setup the whole environment of Docker and Docker Compose on Linux OS.
- How to apply Public Key for authentication.
- How to connect the Version Control System{GitHub} with Rasa-X Server.
- How to upload the data from local machine to Rasa-X server.

METHODOLOGY

Step 1: Study of different RASA and RASA-X documents. **(Feasible study)**
Step 2: Collecting data from different document for the action chatbot. **(Requirement Analysis)**
Step 3: Designing data in yml format**. (Design)**
Step 4: Implementing the yml and python code. **(Implementation)**
Step 5: Testing the yml and python code on different platform. **(Testing)**
Step 6: Deployment of Action Chatbot on Server. **(Deployment)**

Python Libraries that were required to perform both the algorithms:

1- tensorflow
2- spacy
3- scikit-learn
4- keras-applications
5- en-core-web-md AND **en-core-web-sm.**
6- ujson
7- numpy AND **pandas**

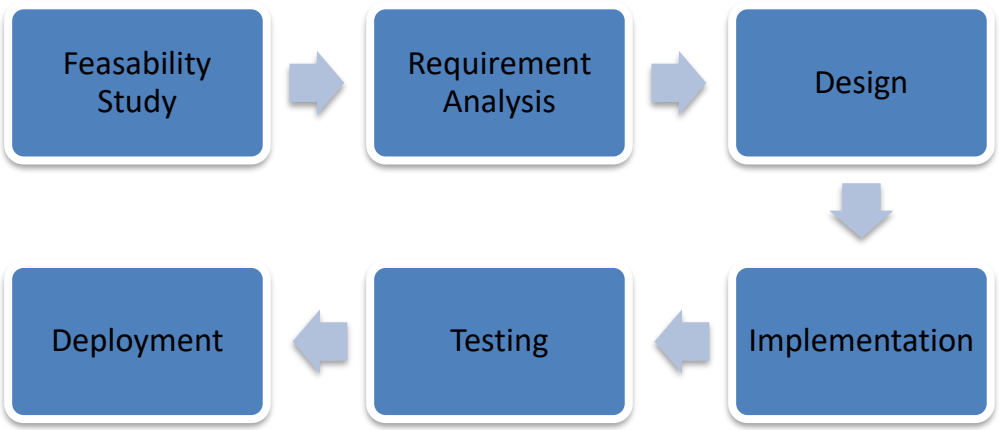


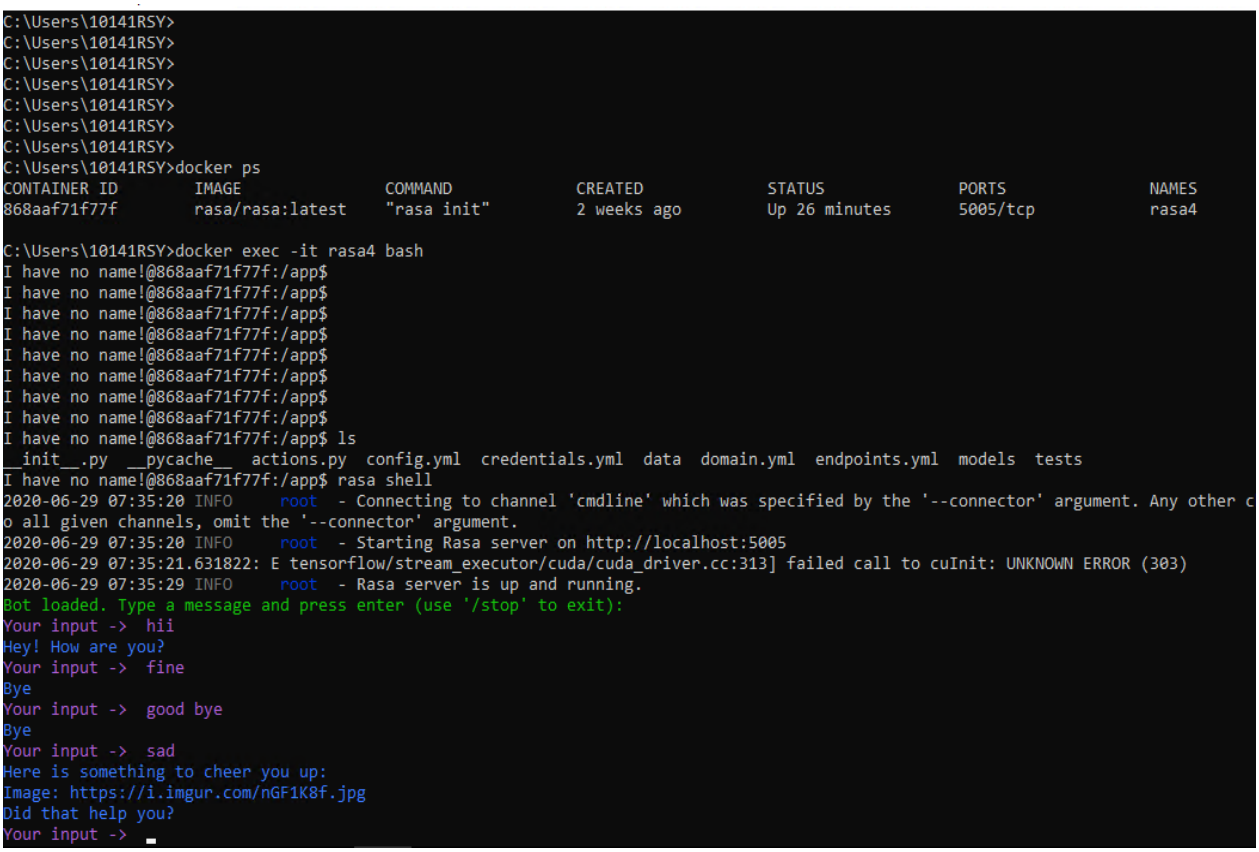
Figure-2

IMPLEMENTATION

First was the normal implementation about docker in my local machine

- Make repository of docker in repo folder then install latest docker community engine, start service and disable firewalld.
- Pull image of rasa from docker Hub and launch docker container from that rasa image.
- Then run chatbot on docker with rasa shell command.

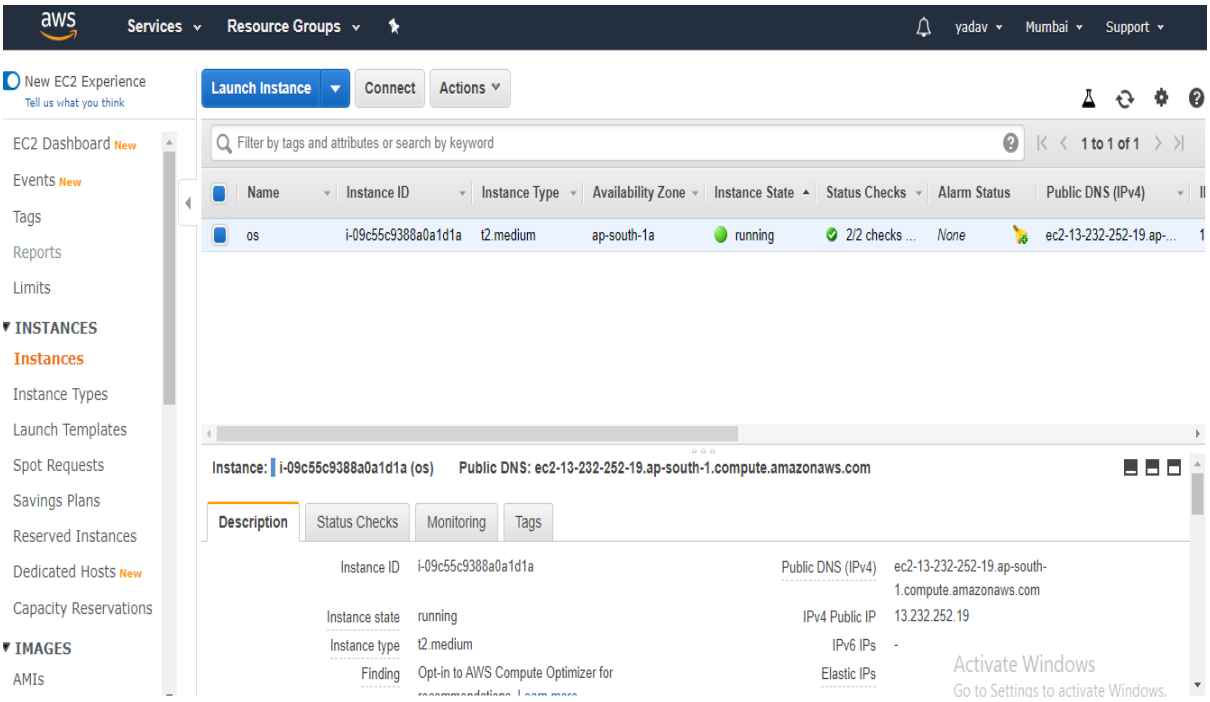
- **See Screensho**



Same thing applied in Linux OS on AWS

- Launch Linux EC2 instance
- Give resource like Redhat8 AMI , 4GiB RAM, 2 CPU, 50 GiB Hard disk, Keypair , Security group.
- Then access that linux terminal through putty software
- Again follow same steps to install the docker and then install docker-compose

Redhat8 EC2 Instance



Docker Installation

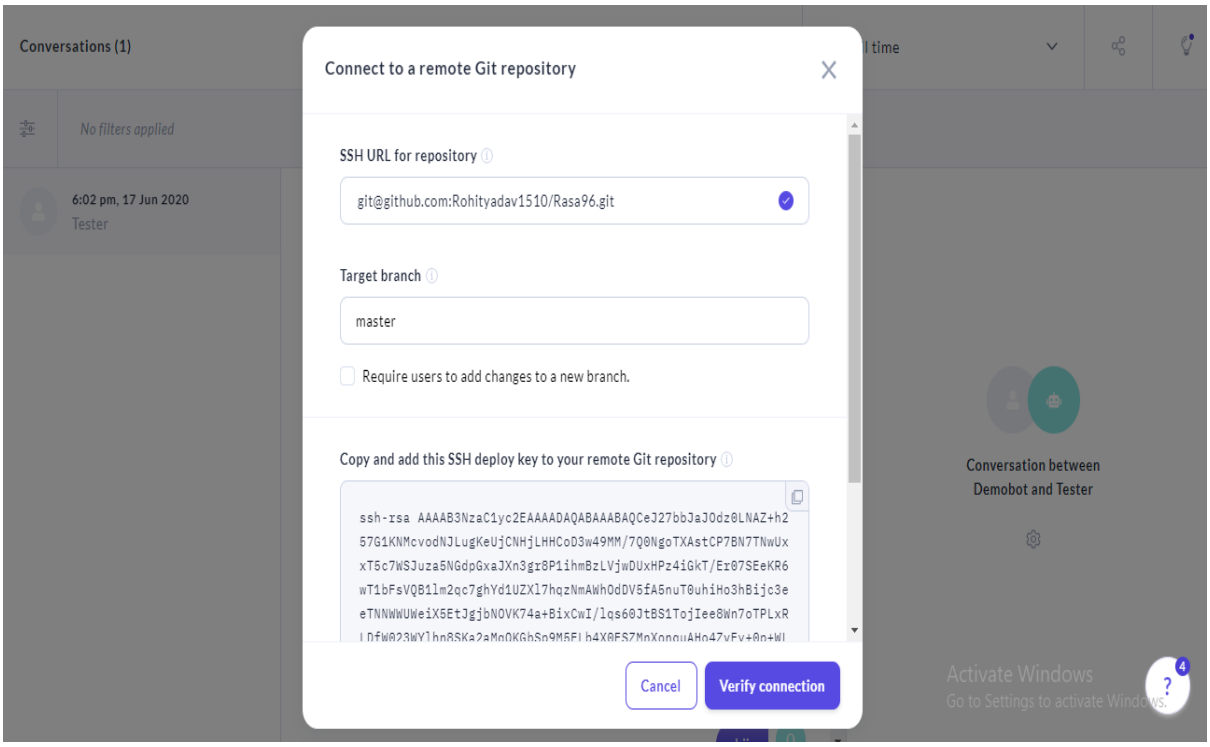
```
[root@docker-ce ~]# dnf config-manager --add-repo=https://download.docker.com/linux/centos/docker-ce.repo

[root@docker-ce ~]# dnf list docker-ce
Available Packages
docker-ce.x86_64             3:19.03.5-3.el7                  docker-ce-stable
[root@docker-ce ~]#

[root@docker-ce ~]# dnf install docker-ce --nobest -y

[root@docker-ce ~]# systemctl start docker
[root@docker-ce ~]# systemctl enable docker

[root@docker-ce ~]# docker --version
Docker version 18.06.3-ce, build d7080c1
[root@docker-ce ~]#
```

Docker Compose Installation

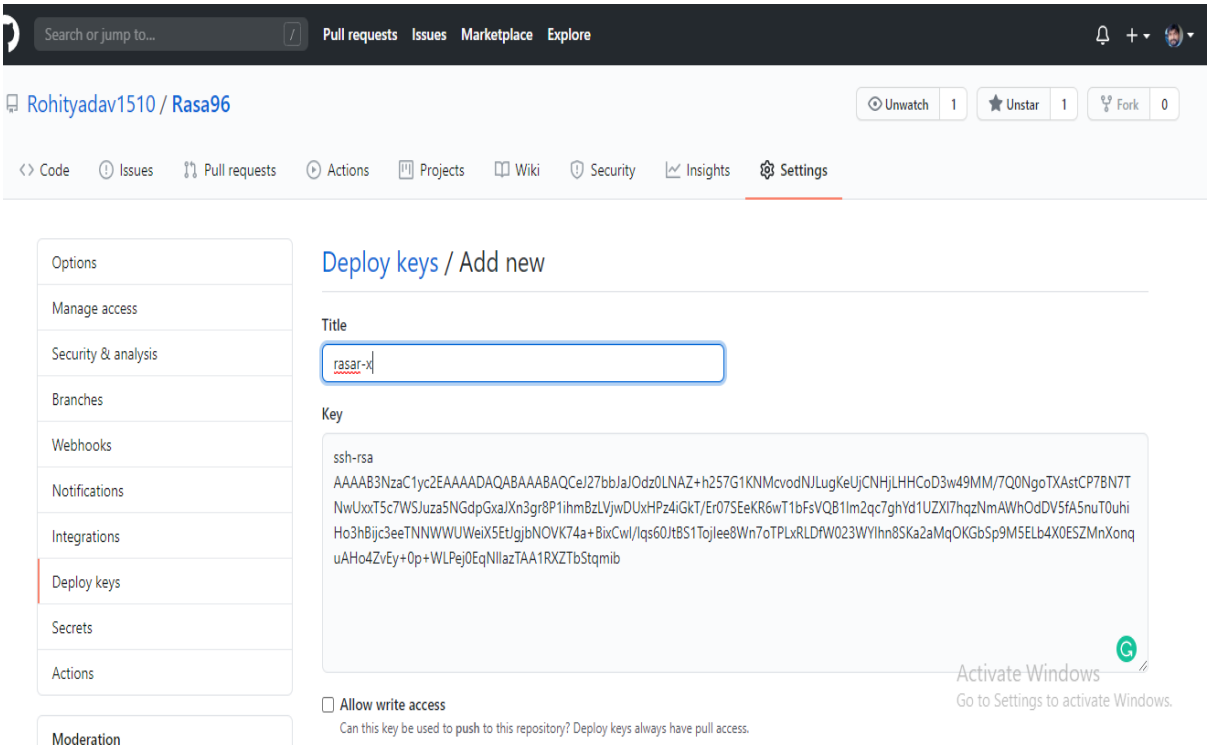
```
[root@docker-ce ~]# dnf install curl -y
[root@docker-ce ~]# curl -L "https://github.com/docker/compose/releases/download/1.25.0/docker-compose-$(uname -
s)-$(uname -m)" -o /usr/local/bin/docker-compose

[root@docker-ce ~]# docker-compose --version
docker-compose version 1.25.0, build 0a186604
[root@docker-ce ~]#
```

- Now Setup Rasa-X in that environment
- curl -sSL -o install.sh https://storage.googleapis.com/rasa-x releases/0.29.3/install.sh
- sudo bash ./install.sh
- cd /etc/rasa
- sudo docker-compose up –d
- sudo python rasa_x_commands.py create --update admin me <PASSWORD>
- Connect with Version Control System{GitHub} to fetch the data from there
- And last OUPUT

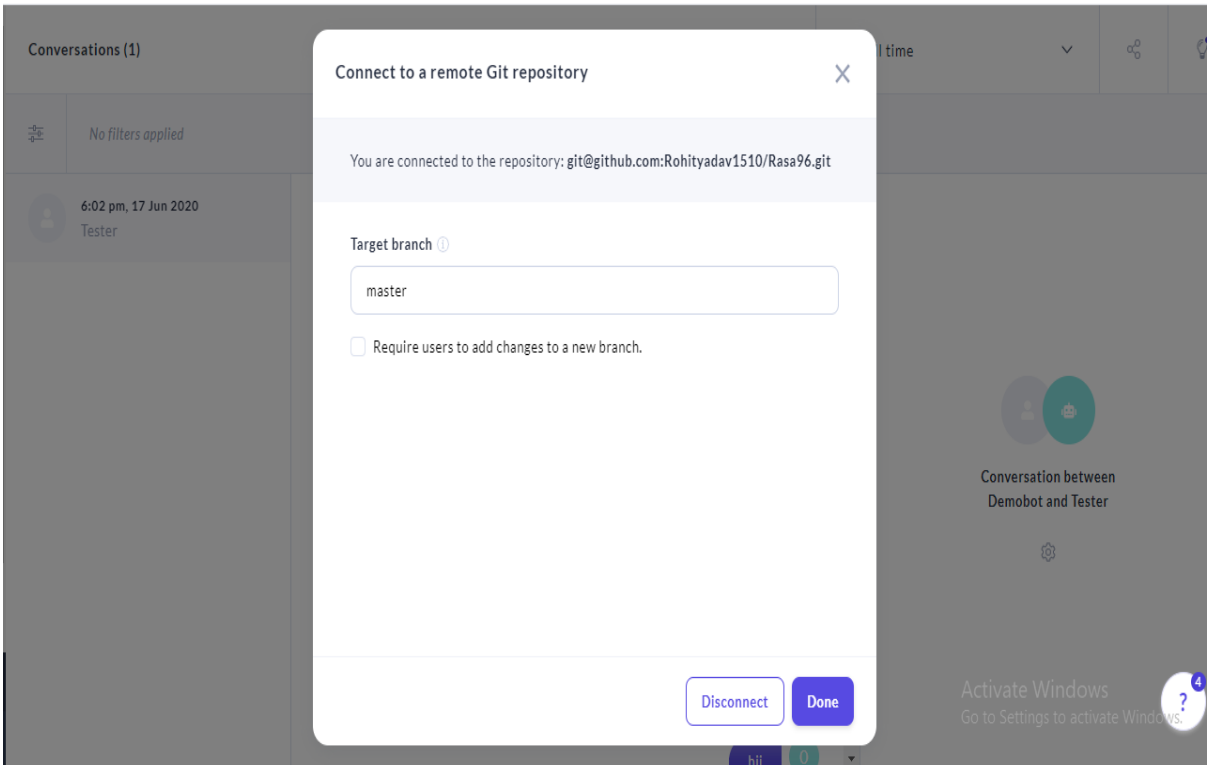
RASA-X server connected with GitHub



Add Private Key In GitHub

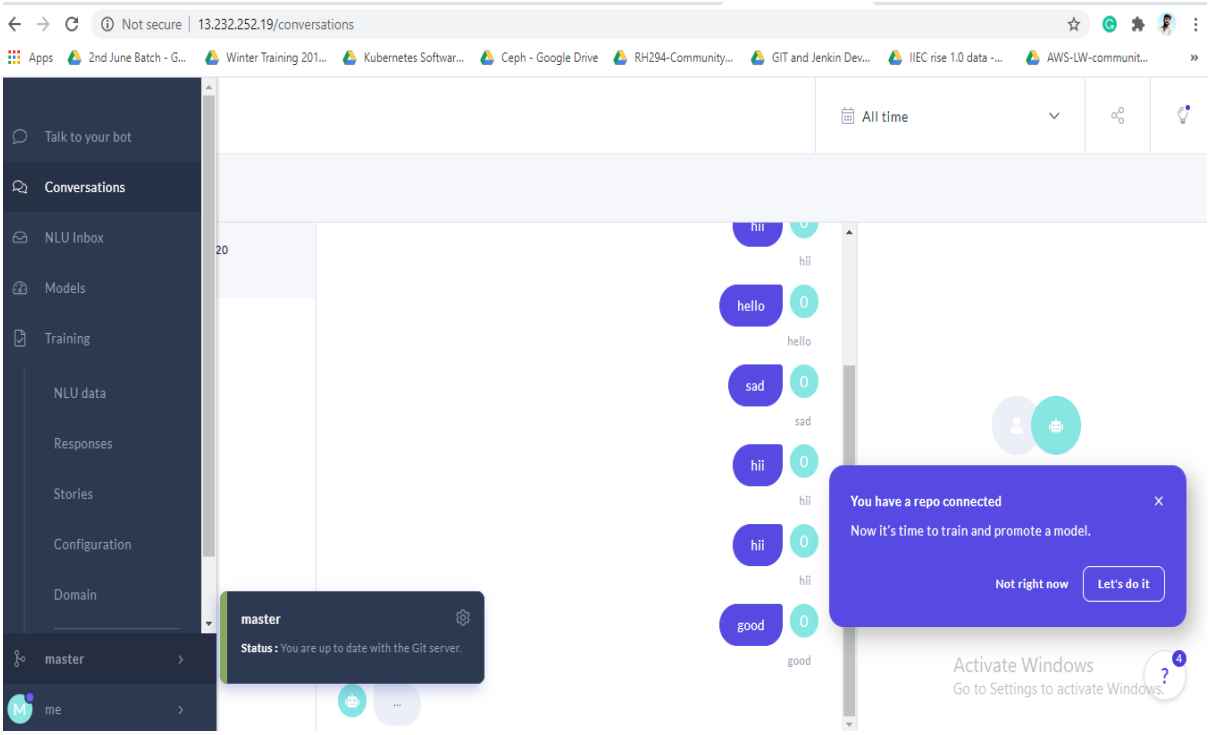


Connection Successful of GitHub Repository



OUTPUT

Dashboard of RASA-X Server



SYSTEM REQUIREMENT

Hardware requirements

- Processor Pentium IV and above
- RAM 8 GB or more
- Hard Disk 50 GB or more

Software requirements

- Rasa environment
- Any Operating Systems (Linux,Windows,etc)

REFERENCES LINK

[1] **https://chatbotslife.com/a-chatbot-abstract-1cd002e7a480**

[2]**https://www.researchgate.net/publication/320307269_Chatbots_An_overview_Types_Architecture_Tools_and_Future_Possibilities**

[3] **https://convertobot.com/blog/the-most-common-chatbot-problems/**