PROJECT REPORT

AI BASED DISCOURSEFOR BANKING INDUSTRY

TEAM ID: PNT2022TMID42870

TEAM MEMBERS:

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INTRODUCTION:

Overview:

- Industries are forced to evolve and update their practices due to technologicaladvances and the contemporary market. The bankingsector is one of the mostdeveloped sectors and is always lookingfor the latesttechnological solutionsthat improveits efficiency.

- Net banking websitesare complex and involve navigating through a lot of pagesto find the information you need. Bank staff undergoes a lot of stressful situations when communicating with clients directly. Such situations can be avoided gracefully by using chatbots.

- Only 32% of companies in the financeindustry currently use AI chatbots,and 37%are planning to start using them within 18 months said a report from Salesforce. This results in a potential growth rate of 118% which indicates the demand in theindustry.
- A smart chatbot takes a query from the user in natural language and gives the appropriate responsefor the same. This paper aims to discuss the relevance ofchatbots in the bankingsector and explorehow chatbots can be implemented

  using natural language processing techniques that can be used in the bankingindustry.

LITERATURE SURVEY:

Existing Problem:

- This paper [1] presents the use of the RASA framework for building smart context-remembering chatbotss, it also describes how Rasa NLU works and howits performance is elevated by using intent recognition and entity extraction. Italso compares the accuracies of entity extraction using Rasa NLU and a NN,
  results show Rasa NLU performs betterto extract entitieswhen whole sentencesare provided as compared to neural networkswhich require segmented inputs.
  This paper discusses Rasa by implementing a chatbot relatedto the financedomain, usingwhich the users can inquireabout stock-related information.
- RASA NLU can introduce a vital component in intelligent chatbot systems. We can composethe system to extract the entity after intent recognition. This can befurther improvedfor complicated sentencesand more entities.
- This paper [2] briefly discussesadvancements in the field of AI and how this hasled to major shifts in some organizations about how they operate. It further mentions how the banking industry has moved to use chatbots for providing aninterface to customers so that they can have an assistant throughout the day forservice. This paper also gauges the ability of current chatbots to provide all theservices that a user needs.

- It includes several strategies for managing dialogue in the banking and finance industry based on ontology. Although further use of AI can make the chatbotnotonly respondto questions but also self-learning to improve itselfin more stages,improving user servicequality and also reducing human load.

Proposed solution:

- The solution to the problemis Artificial intelligence in the bankingsector makes banks efficient, trustworthy, helpful, and more understanding. It is strengthening the competitive edge of modern banks in this digital era. The growingimpact of
  AI in banking sector minimizesoperational costs improvescustomer support andprocess automation.
- Nearly 40% to 50% of financial and banking serviceproviders are usingAI in theirprocesses to harness the power of next-generation AI capabilities. The

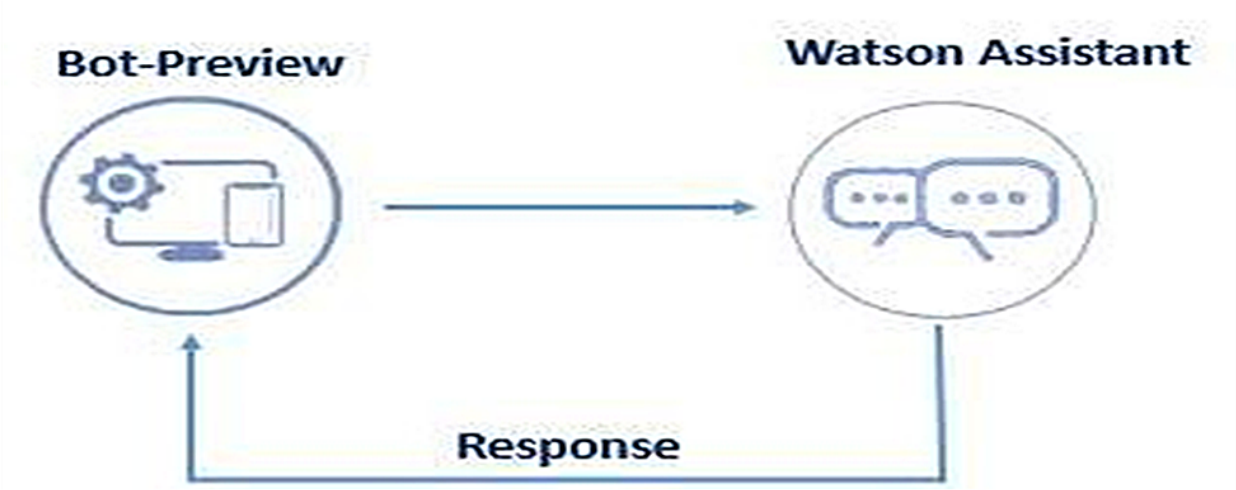
  companies believethat AI is the futureof banking sectorwhich can performarange of banking operations in faster, easier,and more secureways.
- AI banking Chatbotshelp customers in many ways. AI-based chatbotservice for financial industry is one of the significant use cases of AI in banking sector. AI chatbots in banking are modernizing the way how businesses provideservices totheircustomers.
- AI chatbots in the bankingindustry can assistcustomers 24*7 and give accurateresponses to their queries. These chatbots providea personalized experience tousers.
- AI chatbots in banking is providing a better customerexperience.
- Hence, AI chatbotsfor banking and finance operations let banks attractcustomer attention, optimizeservice quality, and expand the brand mark in the market.

THEORETICAL ANALYSIS:

Services Used:

1. IBM Watson Assistant

Block diagram:



Hardware / Softwaredesigning:

To completethis project,you shouldhave the following software and packages.

Softwares:

- Anaconda Spyder (or) Pycharm (or) Anaconda Prompt
- IBM Watson studio

Packages:

- Flask

FLOWCHART:

To accomplish the above task,you must completethe below activities and tasks:

- CreateIBM Services.
- Creating skills & Assistantfor Chatbot.Creating Savings account action.
- Creating Current account action.Creating Loan accountaction.
- Creating a general queryaction.
- Creating a Net bankingaction.
- Create HTML web page.

➤ Integrate the Watson Chatbotwith web page.

ADVANTAGES & DISADVANTAGES:

Advantages:

- Round-the-clock service.
- Brand Consistency.
- Increased Productivity.
- Reduced Staffing Needs.
- Consistent ResponseRate and Availability.
- Helps with Fraud Prevention.
- Chats can be saved.
- Lower costs.

Disadvantages:

- Questions must be programmed beforehand.
- Impersonal
- Must keep information up-to-date.
- Technology issues.

- Needs additional measuresto protectidentities.

APPLICATIONS:

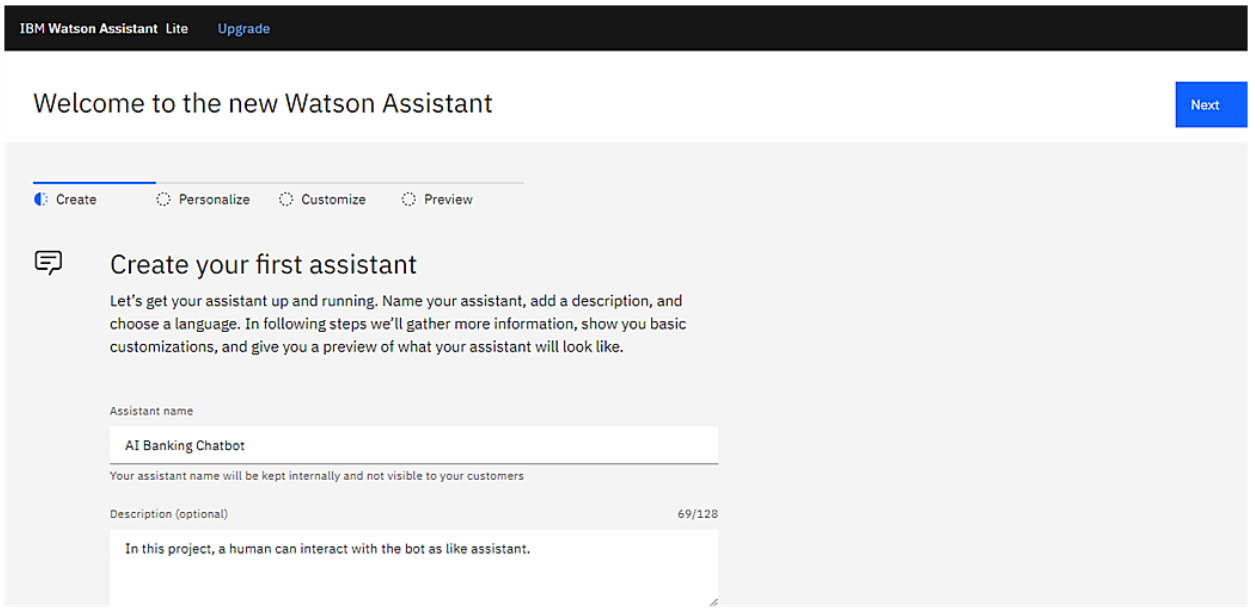
- Banking chatbots have all the data to predict the spending habitsof customersand help them keep theirfinances on track.

APPENDIX:

Create IBM Service

In this activity, you will be creating the Necessary IBM service. The following aretheservicethat you have to create.

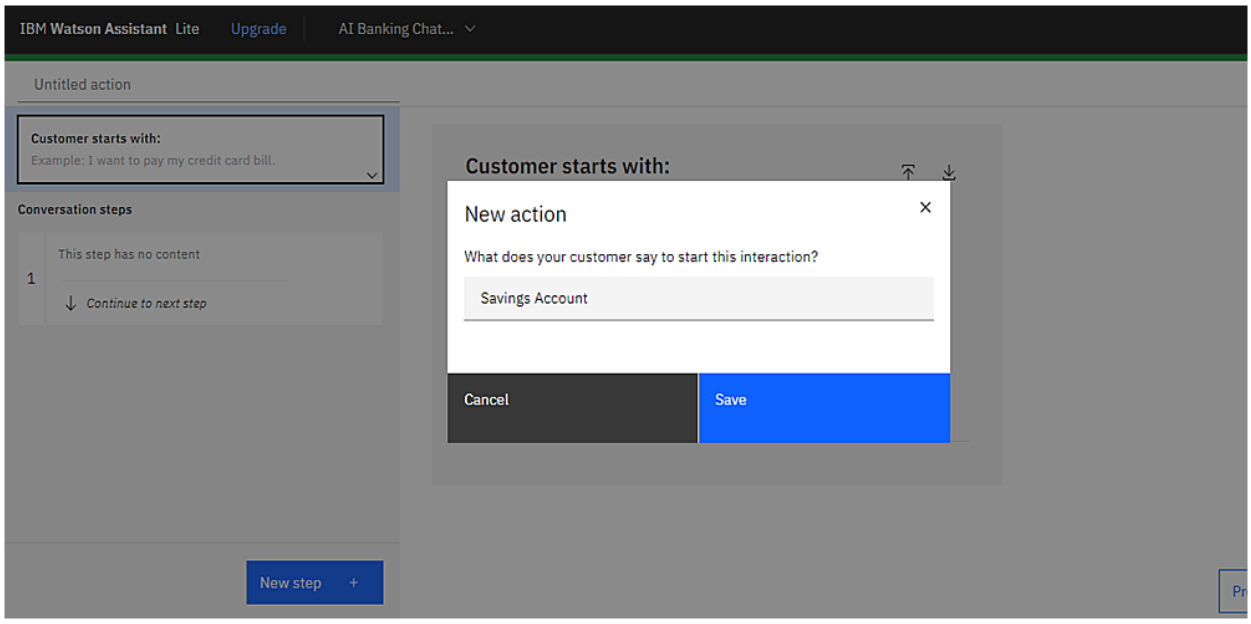
- Watson Assistant (fig.1)



(Fig.1)

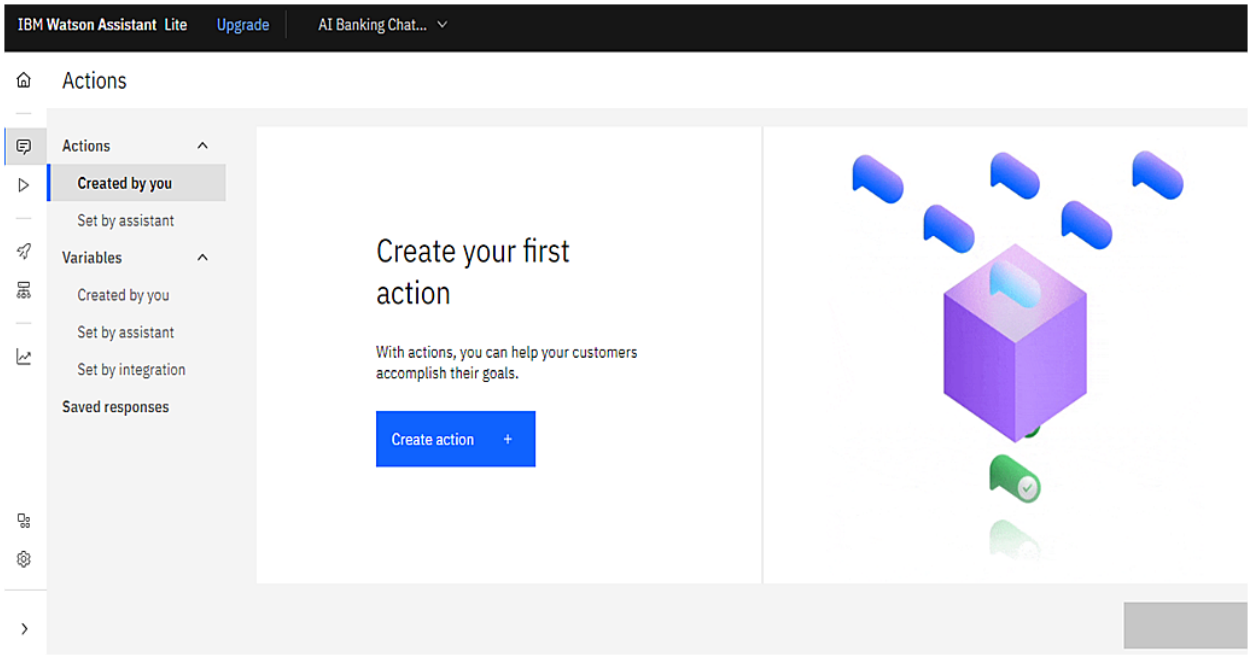
Creating Skills &Assistant For Chatbot

Skills are nothing but actions and steps. Steps are the subsetof actions where conversations are built and Assistant is used to integrate skills.

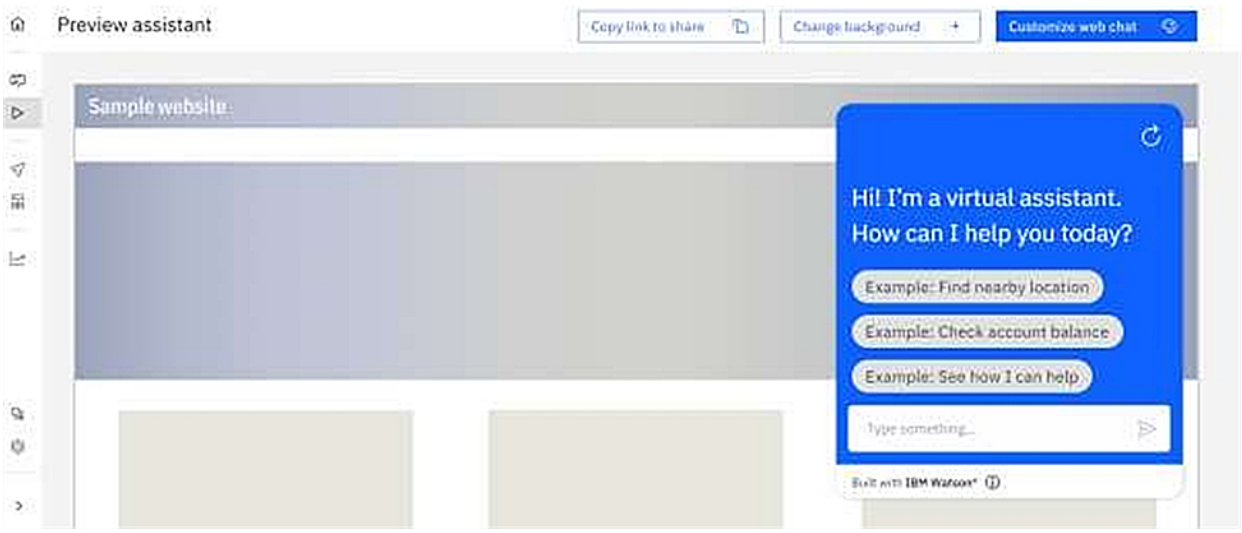


(Fig.2)

A default templatechatbot is created.Need to add actions.


IBM Watson Assistant Lite
Upgrade
AI Banking Chat...
Actions
Actions
Created by you
Set by assistant
Variables
Created by you
Set by assistant
Set by integration
Saved responses
Create your first action
With actions, you can help your customers accomplish their goals.
Create action +

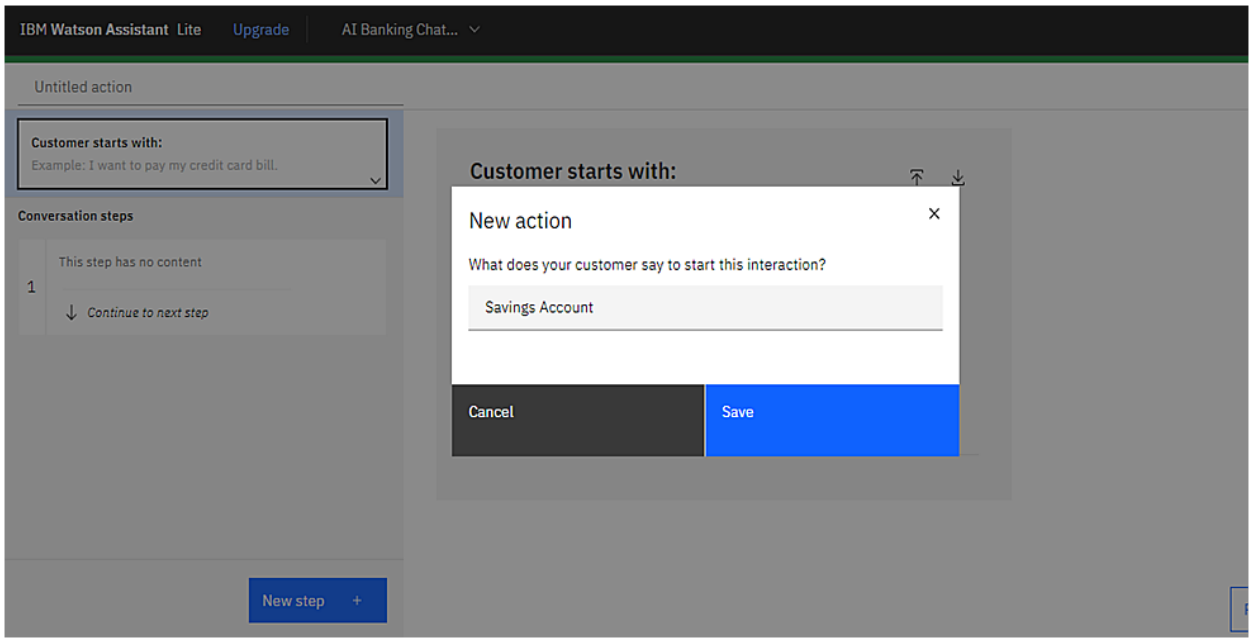
(Fig.3)


Preview assistant
Copy link to share
Change background
Customize web chat
Sample website
Hi! I'm a virtual assistant. How can I help you today?
Example: Find nearby location
Example: Check account balance
Example: See how I can help
Type something...

(Fig.4)

Creating SavingAccount Action

Create a savingaccount in IBM Watson.Create new **Action** Saving.



(Fig.5)

Add steps in savings action ：

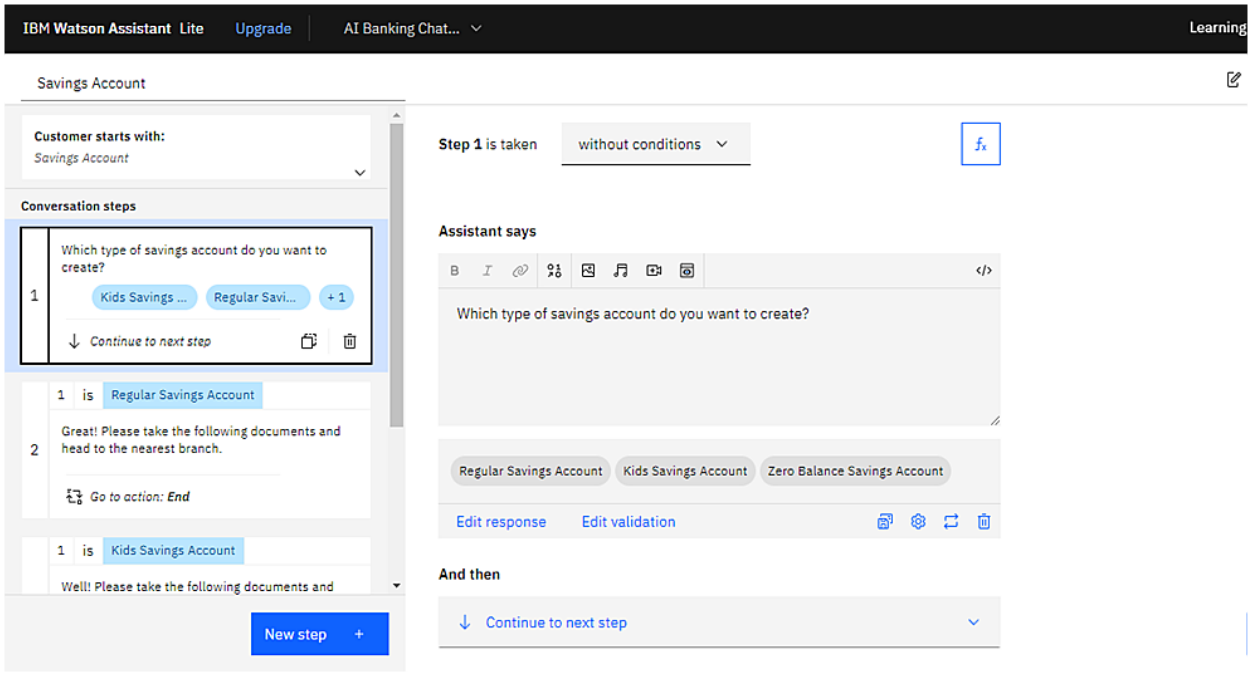


Fig.6

Creating CurrentAccountAction

Create a new **Action** Current for the currentaccount action.

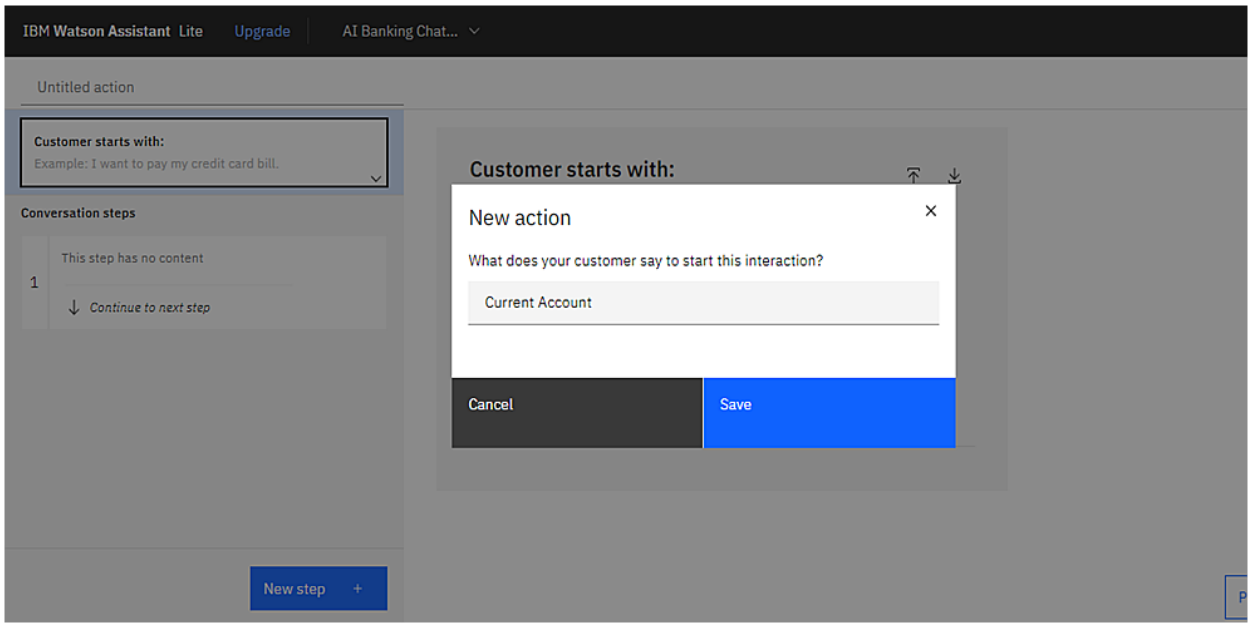


Fig.7

Add steps in Current Account action :

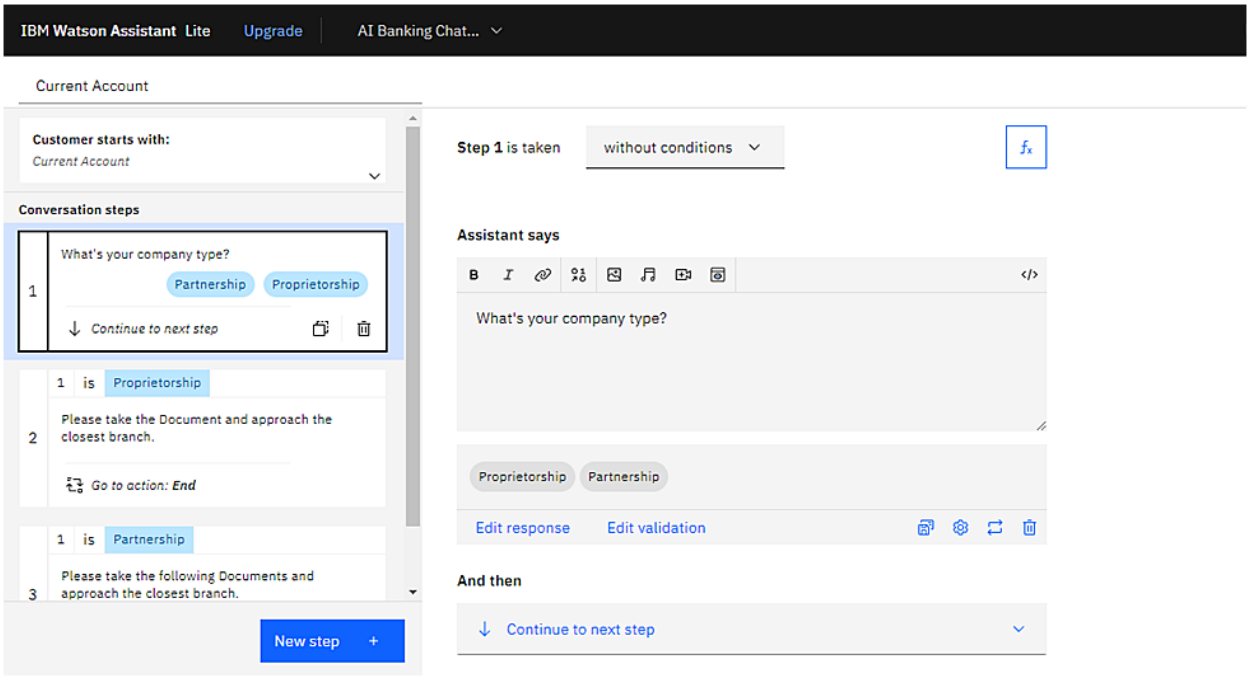


Fig.8

Creating Loan Account Action

Loan actionis created with the necessarysteps.

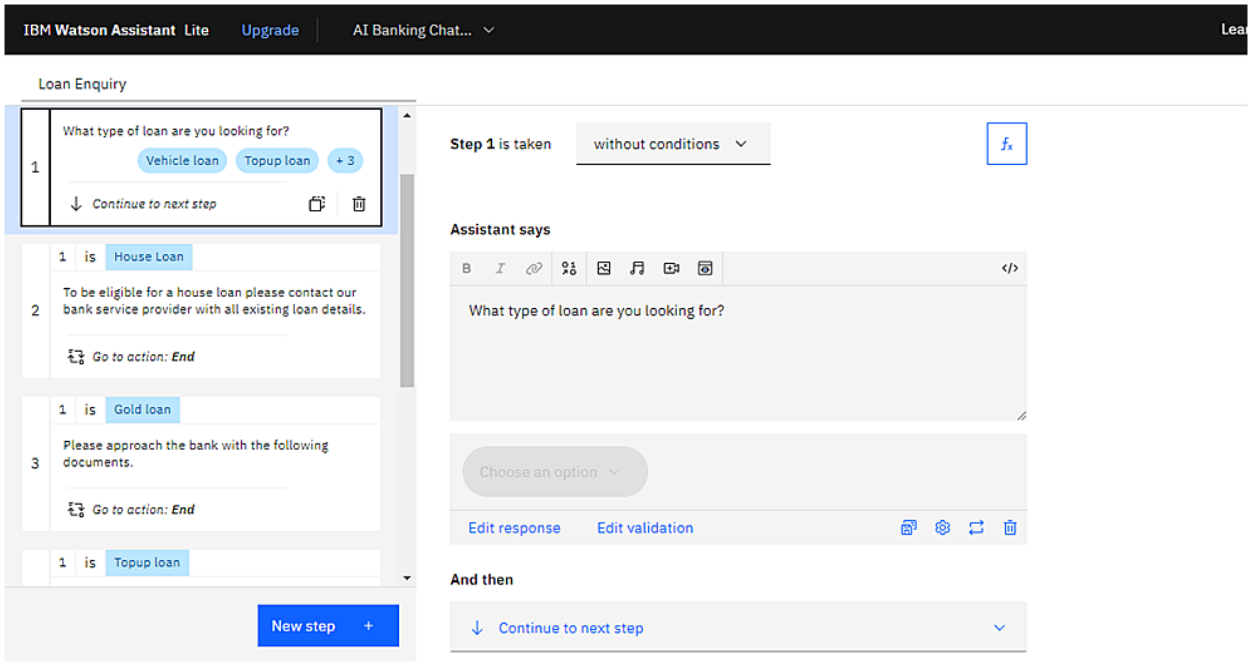


Fig.9

Creating GeneralQuery Action

General query action is created with the necessarysteps.

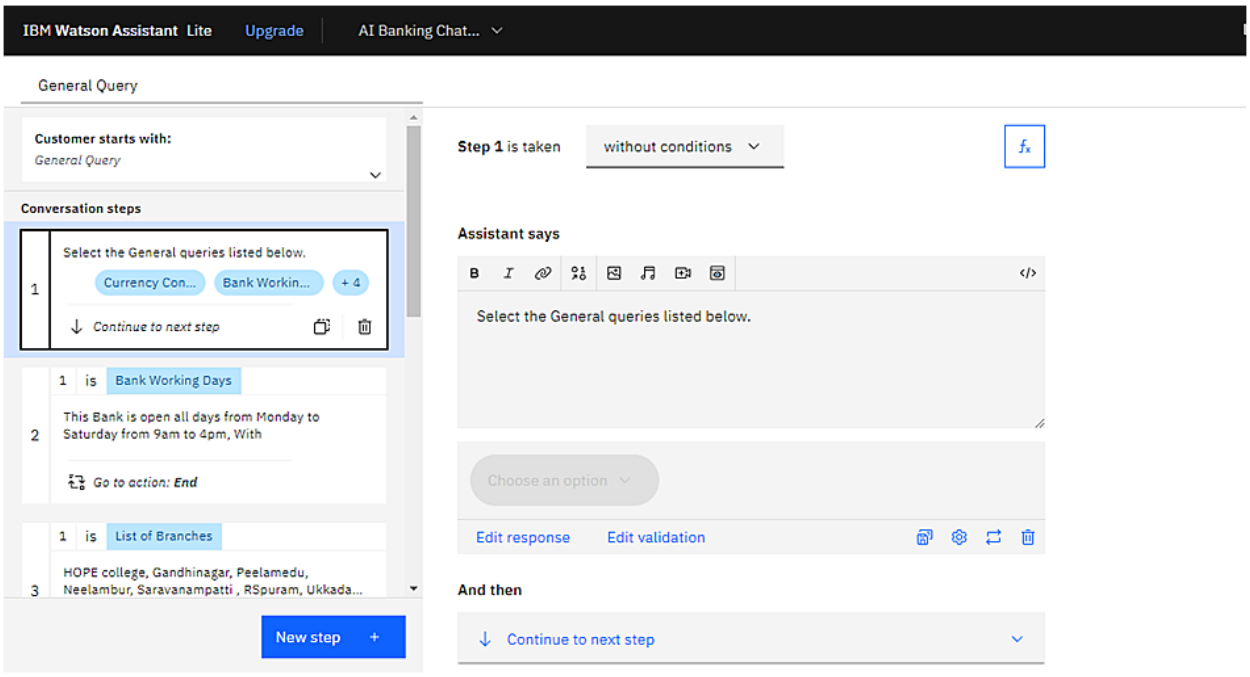


Fig.9

Creating Net Banking Action

Net bankingaction is createdwith the necessarysteps.

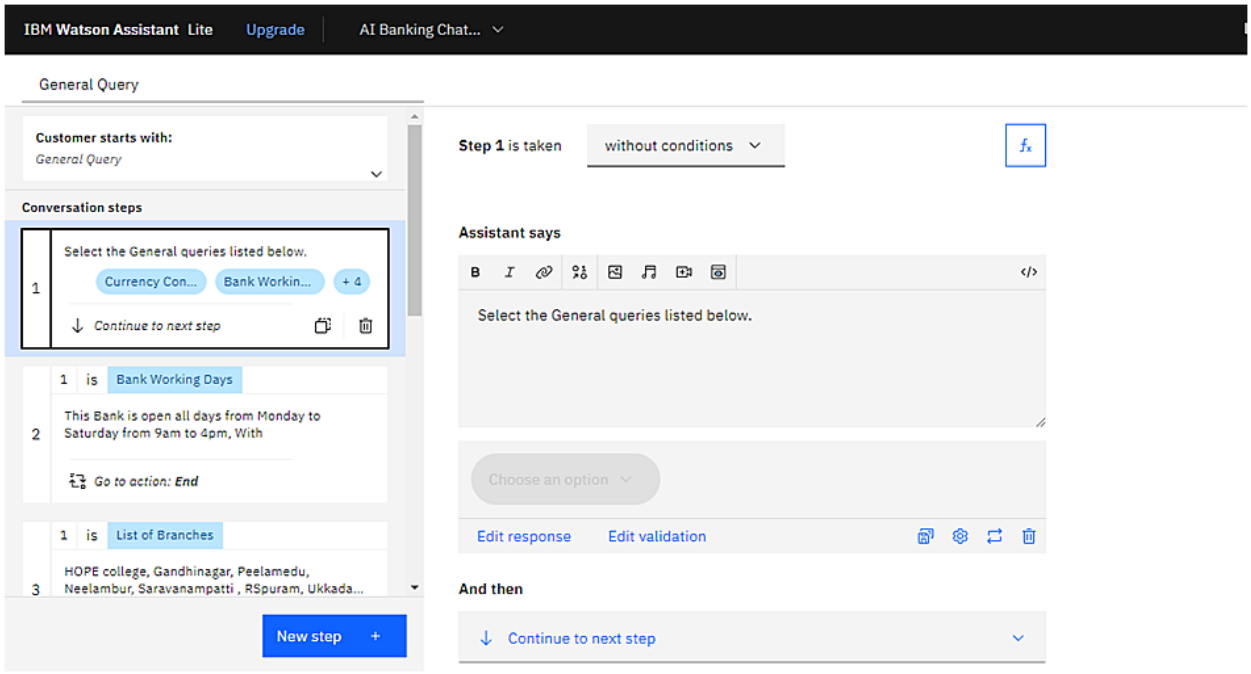


Fig.10

In addition to this greeting,end greeting , indexand end actionsare also created.

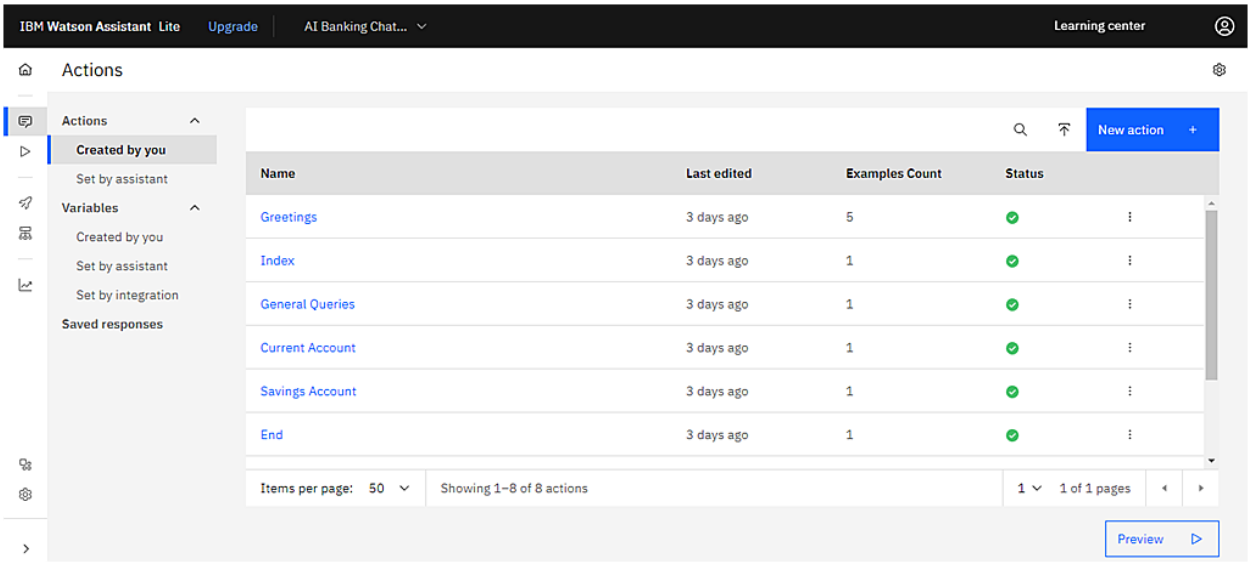


Fig.11

Creating Assistant & Integrate With Flask Web Page

You will be creatinga banking bot in this activity that has the following capabilities

1. The Bot should be able to guide a customer to create a bank account.
2. The Bot should be able to answer loan queries.
3. The Bot should be able to answer generalbanking queries.
4. The Bot should be able to answerqueries regarding net banking.
5. With the help of this bot, you can get all the requireddetails related to banking.

Let us build our flask application which will be running in our localbrowser with a userinterface.

In the flask application, users will interactwith the chatbot,and based on the user queriesthey will get the outcomes.

Build PythonCode

1: ImportingLibraries

```
from flask import Flask, render_template
```

The first step is usually importing the libraries that will be needed in the program.

Importing the flask module into the projectis mandatory. An object of the Flask class is our WSGI application. Flaskconstructor takes the name of the currentmodule (name).

2: Creating our flask application and loading

```
app = Flask(__name__)
```

3: Routing to the Html Page

Here, the declared constructor is used to route to the HTML page createdearlier.

The '/' routeis bound with the bot function. Hence,when the home page of a web serverisopened in the browser, the HTML page will be rendered.

```
@app.route('/')
def bot():
    return render_template('chatbot.html')
```

Main Function :

```
if __name__ == '__main__':
    app.run()
```

This is used to run the application in localhost.

Build HTML Code

- We use HTML to createthe front-end part of the web page.
- Here, we have created 1 HTML page-Chatbot.html
- Chatbot.html displays the home page which integrates with Watson Assistant.
- A simple HTML page is created. Auto-generated source code from IBMWatsonAssistant is copiedand pasted insidethe body tag

- **Run The Application**

- Open the anacondaprompt from the start menu.
- Navigate to the folder where your app.pyresides.
- Now type the “python app.py” command.
- It will show the local host where your app is running on http://127.0.0.1.5000/
- Copy that localhost URL and open that URL in the browser. It does navigatetowhere you can view your web page.

Source Code:

CHATBOT.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta http-equiv="X-UA-Compatible" content="IE=edge">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>AI ChatBot Discourse For Banking</title>
   <!-- Css Link -->
   <link rel="stylesheet" href="../static/css/chatbot.css">
   <!-- Favicon -->
   <link rel="shortcut icon" href="../static/images/favicon_io (1)/android-chrome-
512x512.png" type="image/x-icon">
   <!-- Font Awesome Link -->
   <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-
```

```
awesome/6.2.0/css/all.min.css">
</head>
<body>
   <div class="container">
      <header>
                     <a href="Project.html" class="logo"><img
src="../static/images/robot.png" alt="robot" /></a>
         <ul>
            <li><a href="#">Home</a></li>
            <li><a href="#">Other Services</a></li>
            <li><a href="#">Apply Loan</a></li>
         </ul>
         <div class="searchbox">
               <input type="text" name="search" placeholder="Search" />
               <i class="fa-solid fa-magnifying-glass"></i>
         </div>
      </header>
      <div class="content">
         <h3>This Project is about AI ChatBot Discourse <br>for Banking Industry</h3>
         <a href="login.html"><button class="btn">LogIn</button></a>
         <a href="register.html"><button class="btn">Register</button></a>
      </div>
      <div class="teamid">
        <h6>TEAM ID: PNT2022TMID42870</h6>
        <h6>TEAM MEMBERS:</h6>
        <p>SABARINATHAN R [TL] - 712219205030 </p>
        <p>IRUTHAYA VENISH DURAI S [TM1] - 712219205014</p>
        <p>RANGESH S [TM2] - 712219205028</p>
        <p>SIVASANKAR R [TM3] - 712219205034</p>
      </div>
   </div>
<script>
  window.watsonAssistantChatOptions = {
   integrationID: "8686d2f5-c1b5-4d84-8f76-2aa019b3a056", // The ID of this integration.
   region: "au-syd", // The region your integration is hosted in.
   serviceInstanceID: "998f30c7-0d37-42fc-bd14-56099a2ba361", // The ID of your
service instance.
```

```
   onLoad: function(instance) { instance.render(); }
  };
  setTimeout(function(){
   const t=document.createElement('script');
   t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/" +
(window.watsonAssistantChatOptions.clientVersion || 'latest') +
"/WatsonAssistantChatEntry.js";
   document.head.appendChild(t);
  });
</script>
</body>
</html>
```

LOGIN.HTML

```
<!DOCTYPE html>
<html lang="en">
<head>
	<meta charset="UTF-8">
	<meta http-equiv="X-UA-Compatible" content="IE=edge">
	<meta name="viewport" content="width=device-width, initial-scale=1.0">
	<!-- Css link -->
	<link rel="stylesheet" type="text/css" href="../static/css/login.css">
	<title>Login</title>
</head>
<body>
<div class = "login-box">
	<h2>Login</h2>
	<form>
		<div class = "user-box">
			<input type = "text" name = "" required = "">
			<label>Username</label>
		</div>
		<div class = "user-box">
			<input type = "password" name = "" required = "">
			<label>Password</label>
```

```
            </div>
            <div class="button-form">
                <a id = "submit" href = "Project.html">Submit</a>
                <div id = "register">
                    <p>Don't have an account ? </p>
                    <a href="register.html"> Register</a>
                </div>
            </div>
        </form>
</div>
</body>
</html>
```

REGISTRATION.HTML

```
<link rel="stylesheet" type="text/css" href="../static/css/register.css">
<div class="register-box">
        <h2>Register</h2>
        <form>
            <div class="user-box">
                <input type = "text" name = "" required = "">
                <label>Enter Name</label>
            </div>
            <div class = "user-box">
                <input type = "Email" email = "" required = "">
                <label>Enter Mail ID</label>
            </div>
            <div class = "user-box">
                <input type = "password" name = "" required = "">
                <label>Enter Password</label>
            </div>
            <div class = "user-box">
                <input type = "password" name = "" required = "">
                <label>Confirm Password</label>
            </div>
            <div class="button-form">
```

```
                    <a id = "register" href = "Project.html">Register</a>
                    <div id = "login">
                        <p>Already have an account ?</p>
                        <a href="login.html"> Login</a>
                    </div>
                </div>
        </form>
</div>
```

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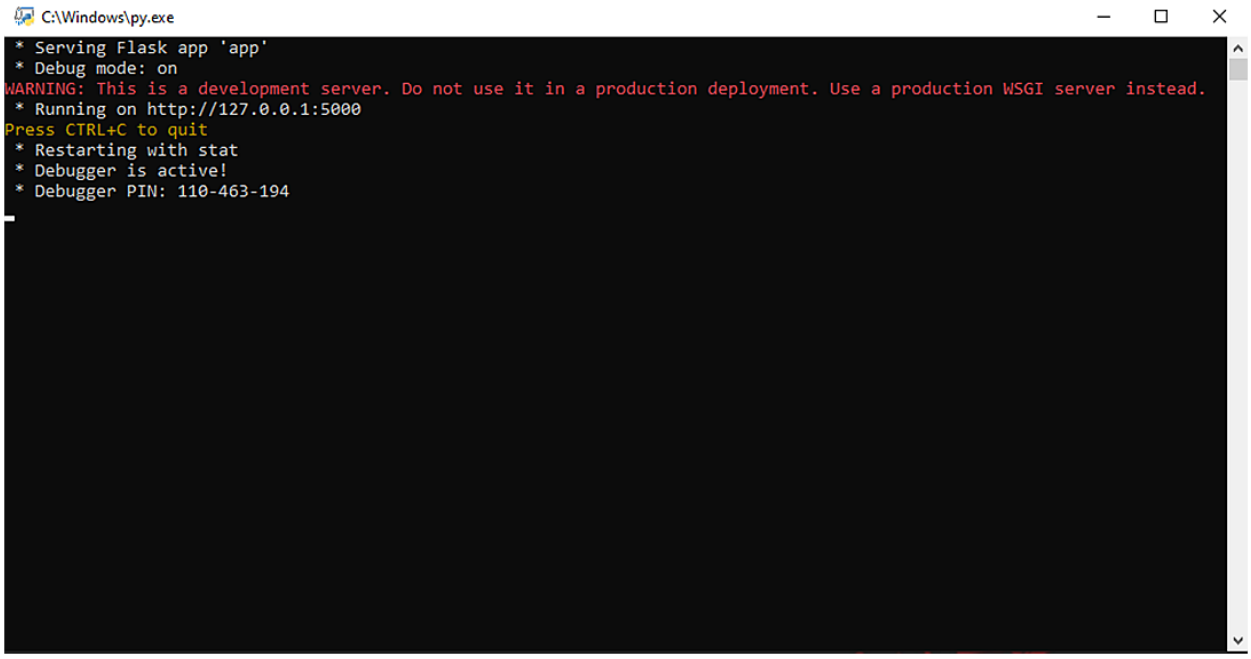
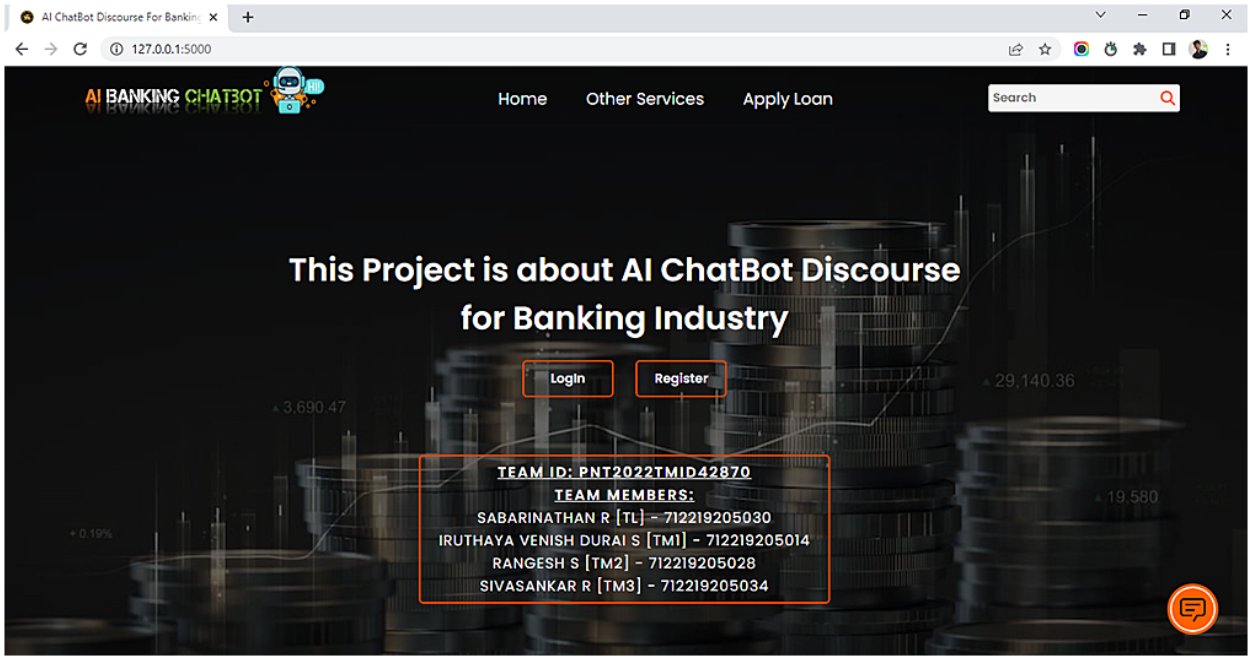
app.py :

```
from flask import Flask,request,redirect
from flask import render_template
app = Flask(__name__,template_folder='templates')


@app.route('/login.html')
def login():
   return render_template("login.html")
```

```
@app.route('/register.html')
def register():
    return render_template("register.html")

@app.route('/')
def bot():
    return render_template('Project.html')
if __name__ == "__main__":
    app.run(debug=True)
```

OUTPUT :




AI ChatBot Discourse For Banking
127.0.0.1:5000
AI BANKING CHATBOT
Home
Other Services
Apply Loan
Search
This Project is about AI ChatBot Discourse for Banking Industry
Login
Register
TEAM ID: PNT2022TMID42870
TEAM MEMBERS:
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IRUTHAYA VENISH DURAI S [TM1] - 712219205014
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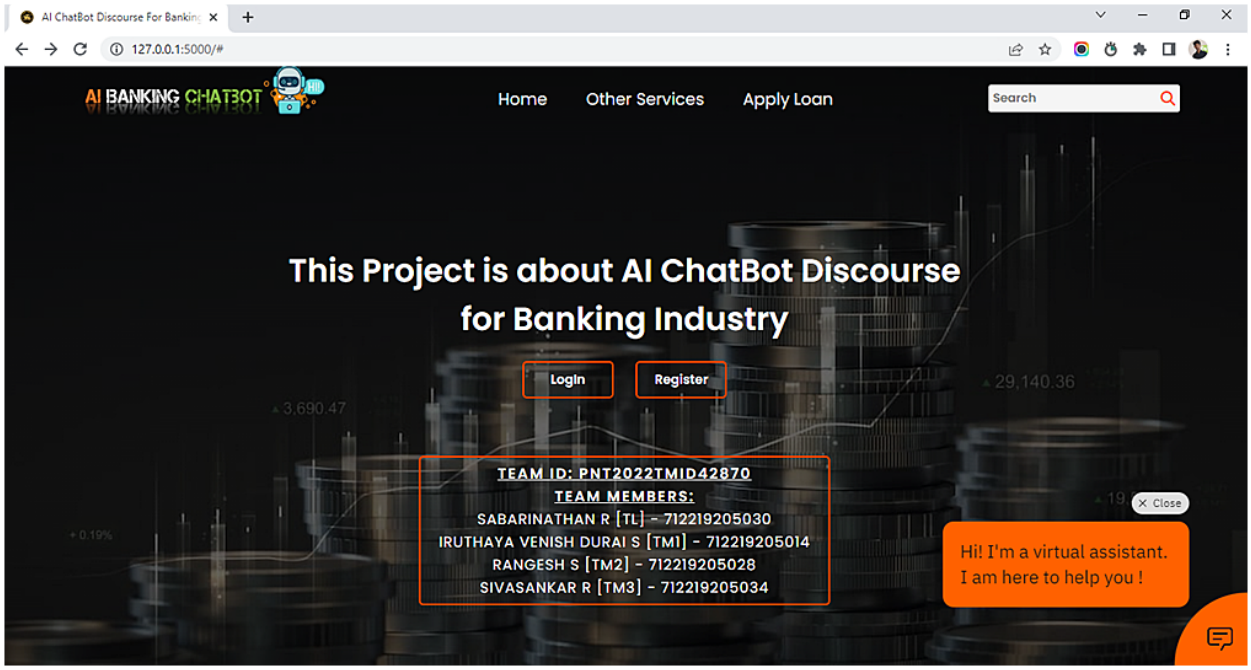
AI ChatBot Discourse For Banking
127.0.0.1:5000/#
AI BANKING CHATBOT
Home
Other Services
Apply Loan
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This Project is about AI ChatBot Discourse for Banking Industry
Login
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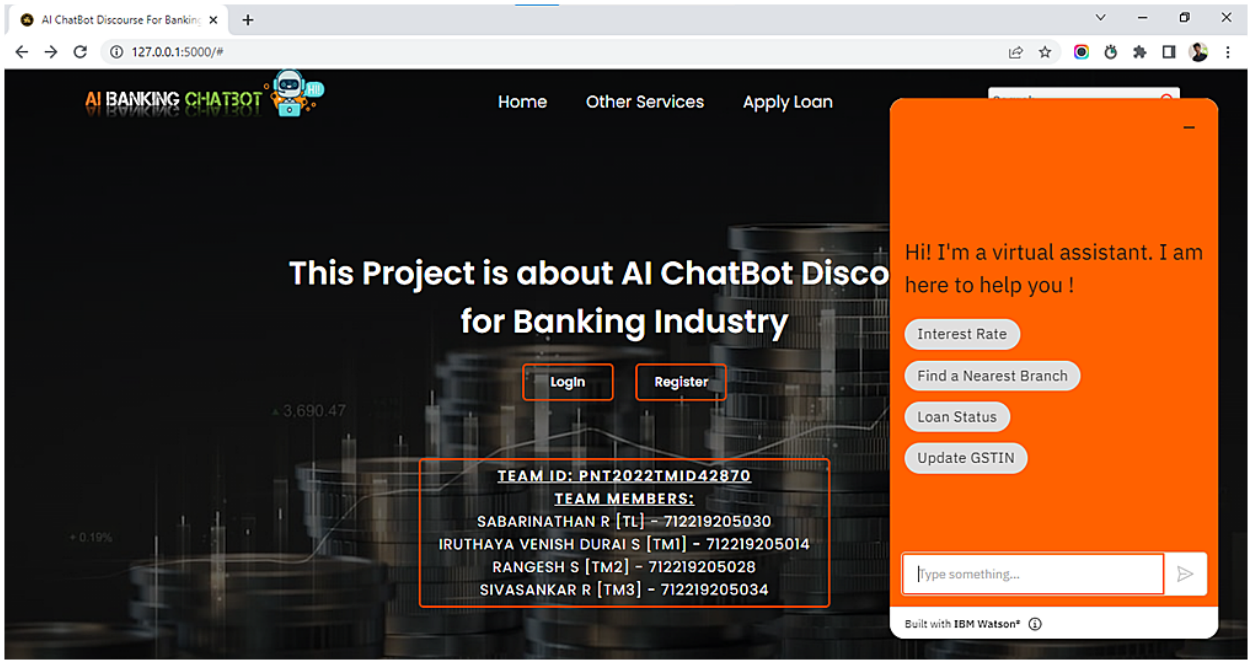
RANGESH S [TM2] - 712219205028
SIVASANKAR R [TM3] - 712219205034
Close
Hi! I'm a virtual assistant.
I am here to help you !


AI BANKING CHATBOT
Home
Other Services
Apply Loan
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for Banking Industry
Login
Register
TEAM ID: PNT2022TMID42870
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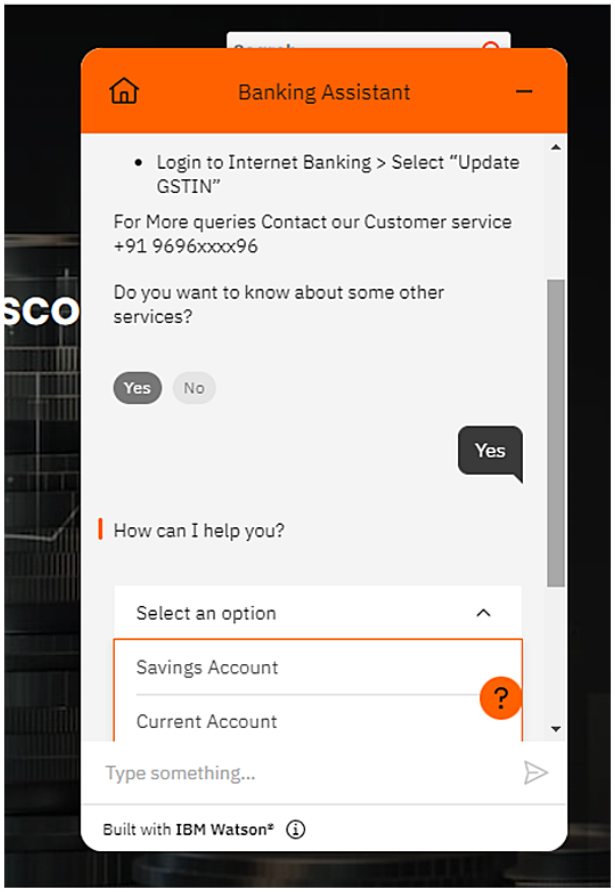
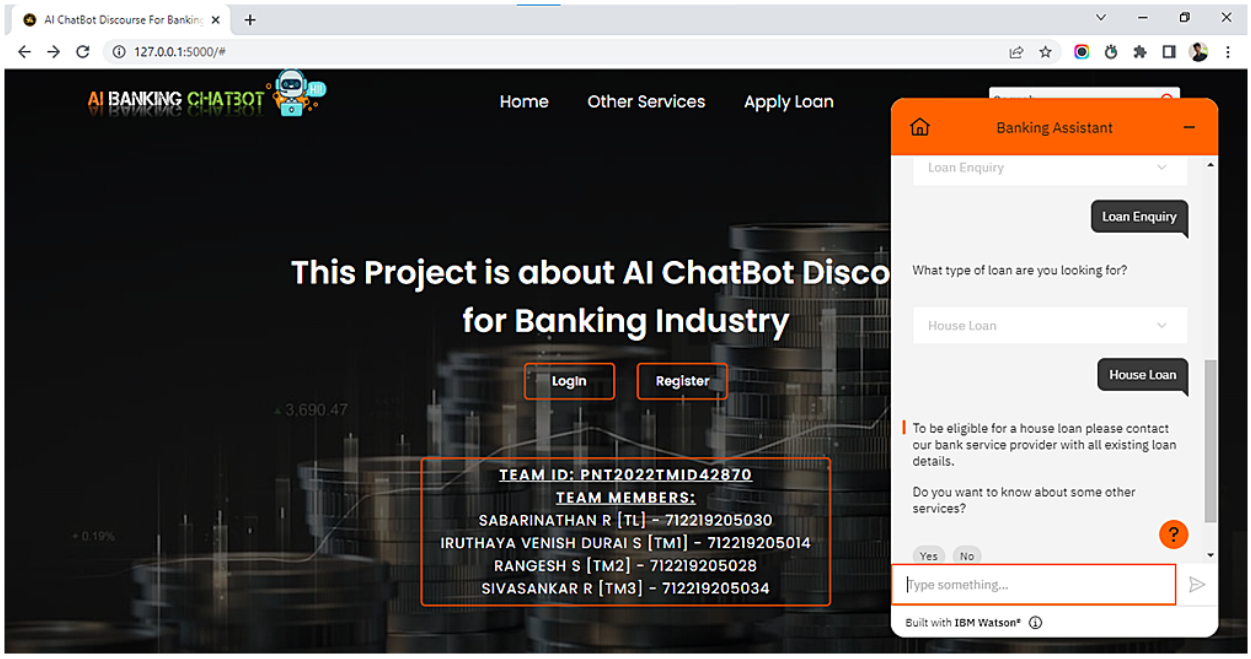
RANGESH S [TM2] - 712219205028
SIVASANKAR R [TM3] - 712219205034
Hi! I'm a virtual assistant. I am here to help you !
Interest Rate
Find a Nearest Branch
Loan Status
Update GSTIN
Type something...
Built with IBM Watson®


Banking Assistant
Login to Internet Banking > Select "Update GSTIN"
For More queries Contact our Customer service +91 9696xxxx96
Do you want to know about some other services?
Yes
No
Yes
How can I help you?
Select an option
Savings Account
Current Account
Type something...
Built with IBM Watson®



AI BANKINGCHATBOT:

PREVIEW OF CHATBOT:

https://web-chat.global.assistant.watson.appdomain.cloud/preview.html?backgroundImageURL=https%3A%2F%2Fau-syd.assistant.watson.cloud.ibm.com%2Fpublic%2Fimages%2Fupx-998f30c7-0d37-42fc-bd14-56099a2ba361%3A%3A8cbfa33c-7ee8-472e-85b4-437e2020bd5a&integrationID=8686d2f5-c1b5-4d84-8f76-2aa019b3a056&region=au-syd&serviceInstanceID=998f30c7-0d37-42fc-bd14-56099a2ba361

REFERENCE:

1. Jiao, Anran. (2020). An Intelligent Chatbot System Based on Entity Extraction Using RASA NLU and NeuralNetwork. Journal of Physics: Conference Series. 1487. 012014.10.1088/1742- 6596/1487/1/012014.

2. Fathima, Sasha & Student, Suhel & Shukla, Vinod & Vyas, Dr Sonali & Mishra,Ved P. (2020). Conversation to Automation in Banking ThroughChatbot Using ArtificialMachine Intelligence Language.10.1109/ICRITO48877.2020.9197825.

3. Singh, Netra& Singh, Devender.(2019). Chatbotsand Virtual Assistantin Indian Banks.Industrija. 47. 75-101. 10.5937/industrija47- 24578.

4. Petr Lorenc, "Joint model for intent and entityrecognition" in arXiv:2109.03221v1 [cs.CL]7Sep 2021

5. The Rasa documentation. [Online].Available: https: //rasa.com/docs/rasa/2.x

6. Django documentation. [Online]. Available:https://docs.djangoproject.com/en/4.0/

7. Adamopoulou, Eleni, and LefterisMoussiades. "An overviewof chatbot technology." In IFIP International Conference on Artificial Intelligence Applications and Innovations, pp. 373-383. Springer, Cham, 2020.

8. Cahn, Jack. "CHATBOT: Architecture, design, & development." University of Pennsylvania School of Engineering and Applied

ScienceDepartment of Computerand Information Science (2017)

9. Hien, Ho Thao, Pham-Nguyen Cuong, Le Nguyen Hoai Nam, Ho Le Thi Kim Nhung, and Le Dinh Thang. "Intelligent assistants in higher- education environments: the FIT-EBot, a chatbot for administrative and learningsupport." In Proceedings of the ninth international symposiumon information and communication technology, pp. 69- 76. 2018.

10. Waterman, Chinia.2018. "Consumer OnlineBanking Trends 2018". Humley. https://humleyai.com/2018/09/18/consumer-online- banking- trends-2018/.

11. "Chatbots, A Game ChangerFor Banking & Healthcare, Saving $8BillionAnnually By 2022". 2017. Juniperresearch.Com. https://www.juniperresearch.com/press/chatbots-a-game-changer- for-banking-healthcare.

12. Pal, Singh Netra, and Devender Singh."Chatbots and virtualassistantin Indianbanks." Industrija 47, no. 4 (2019): 75-101