

AI BASED DISCOURSE FOR BANKING INDUSTRY

Team ID: PNT2022TMID20494

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INTRODUCTION :

Overview:

1. Industries are forced to evolve and update their practices due to technological advances and the contemporary market. The banking sector is one of the most developed sectors and is always looking for the latest technological solutions that improve its efficiency.
2. Net banking websites are complex and involve navigating through numerous pages to 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.
3. Only 32% of companies in the finance industry 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 the industry.
4. A smart chatbot takes a query from the user in natural language and gives the appropriate response for the same. This paper aims to discuss the relevance of chatbots in the banking sector and explore how chatbots can be implemented using natural language processing techniques that can be used in the banking industry.

LITERATURE SURVEY:

Existing Problem:

1. This paper [1] presents the use of the RASA framework for building smart context-remembering chatbots, it also describes how Rasa NLU works and how its performance is elevated by using intent recognition and entity extraction. It also compares the accuracies of entity extraction using Rasa NLU and a NN, results show Rasa NLU performs better to extract entities when whole sentences are provided as compared to neural networks which require segmented inputs. This paper discusses Rasa by implementing a chatbot related to the finance domain, using which the users can inquire about stock-related information.
2. RASA NLU can introduce a vital component in intelligent chatbot systems. We can compose the system to extract the entity after intent recognition. This can be further improved for complicated sentences and more entities.
3. This paper [2] briefly discusses advancements in AI and how this has led to major shifts in some organizations about how they operate. It further mentions how the banking industry has moved to use chatbots for providing an interface to customers so that they can have an assistant throughout the day for service. This paper also gauges the ability of current chatbots to provide all the services that a user needs.
4. It includes several strategies for managing dialogue in the banking and finance industry based on ontology. Although further use of AI can make the chatbot not only respond to questions but also self-learning to improve itself in more stages, improving user service quality and also reducing human load.

Proposed solution:

1. The solution to the problem is Artificial intelligence in the banking sector makes banks efficient, trustworthy, helpful, and more understanding. It is strengthening the competitive edge of modern banks in this digital era. The growing impact of AI in banking sector minimizes operational costs improves customer support and process automation.
2. Nearly 40 percent to 50 percent of financial and banking service providers are using AI in their processes to harness the power of next-generation AI capabilities. The companies believe that AI is the future of banking sector which can perform a range of banking operations in faster, easier, and more secure ways.

3. AI banking Chatbots help customers in many ways. AI-based chatbot service 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 provide services to their customers
4. AI chatbots in the banking industry can assist customers 24*7 and give accurate responses to their queries. These chatbots provide a personalized experience to users.
5. AI chatbots in banking is providing a better customer experience.
6. Hence, AI chatbots for banking and finance operations let banks attract customer attention, optimize service quality, and expand the brand mark in the market.

THEORETICAL ANALYSIS:

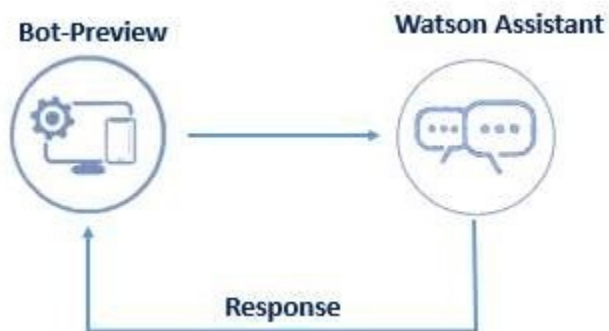
Services Used:

- IBM Watson Assistant

Watson Assistant



Block diagram:



Hardware / Software designing:

To complete this project, you should have the following software and packages.

Softwares:

- Visual studio code
- IBM Watson studio

Packages:

- Flask

FLOWCHART:

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

- Create IBM Services.
- Creating skills & Assistant for Chatbot.
- Creating Savings account action.
- Creating Current account action.
- Creating Loan account action.
- Creating a general query action.
- Creating a Net banking action.
- Create HTML web page.
- Integrate the Watson Chatbot with web page.

ADVANTAGES & DISADVANTAGES:

Advantages:

- Round-the-clock service.

- Brand Consistency.
- Increased Productivity.
- Reduced Staffing Needs.
- Consistent Response Rate 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 measures to protect identities.

APPLICATIONS:

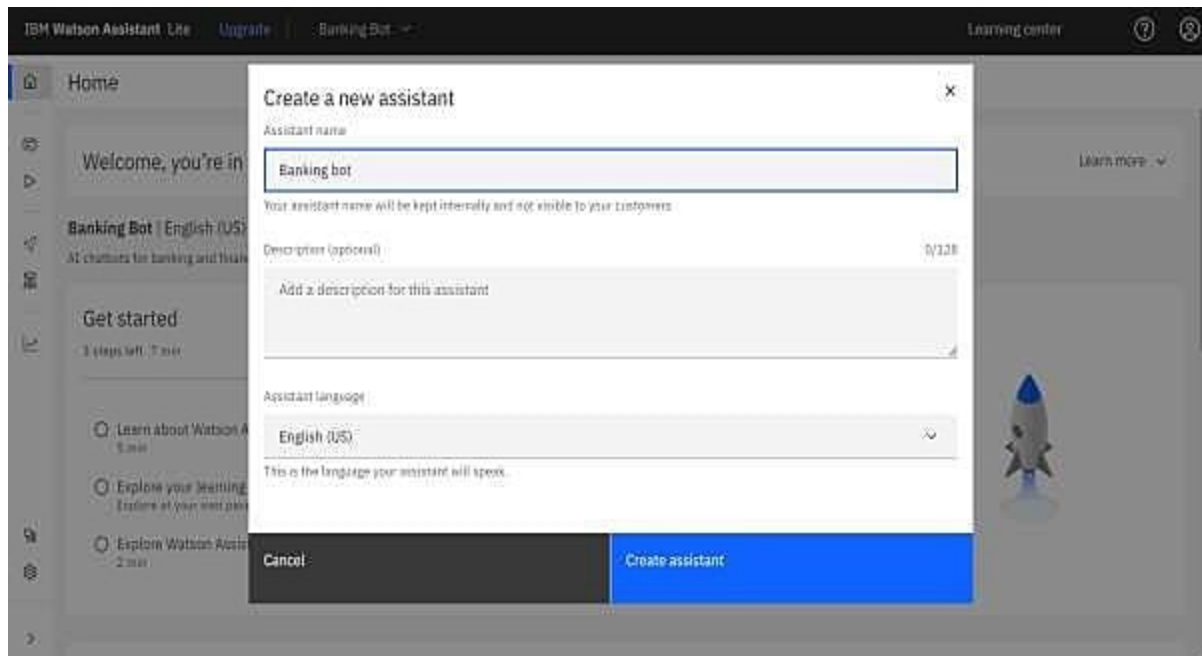
- Banking chatbots have all the data to predict the spending habits of customers and help them keep their finances on track.

APPENDIX:

Create IBM Service

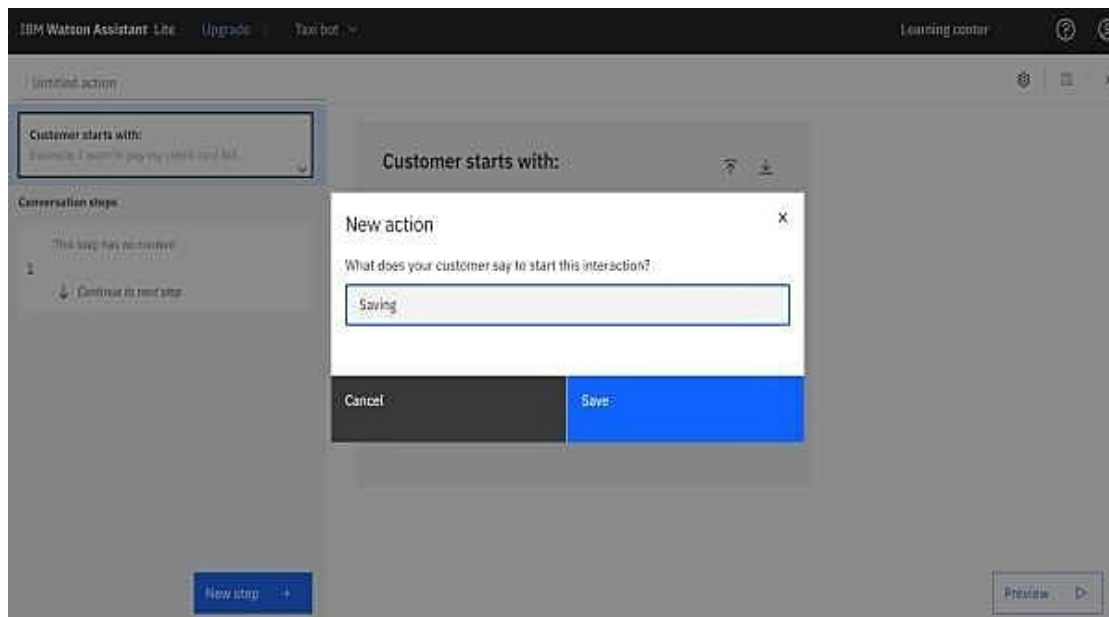
In this activity, you will be creating the Necessary IBM service. The following are the service that you have to create.

- Watson Assistant

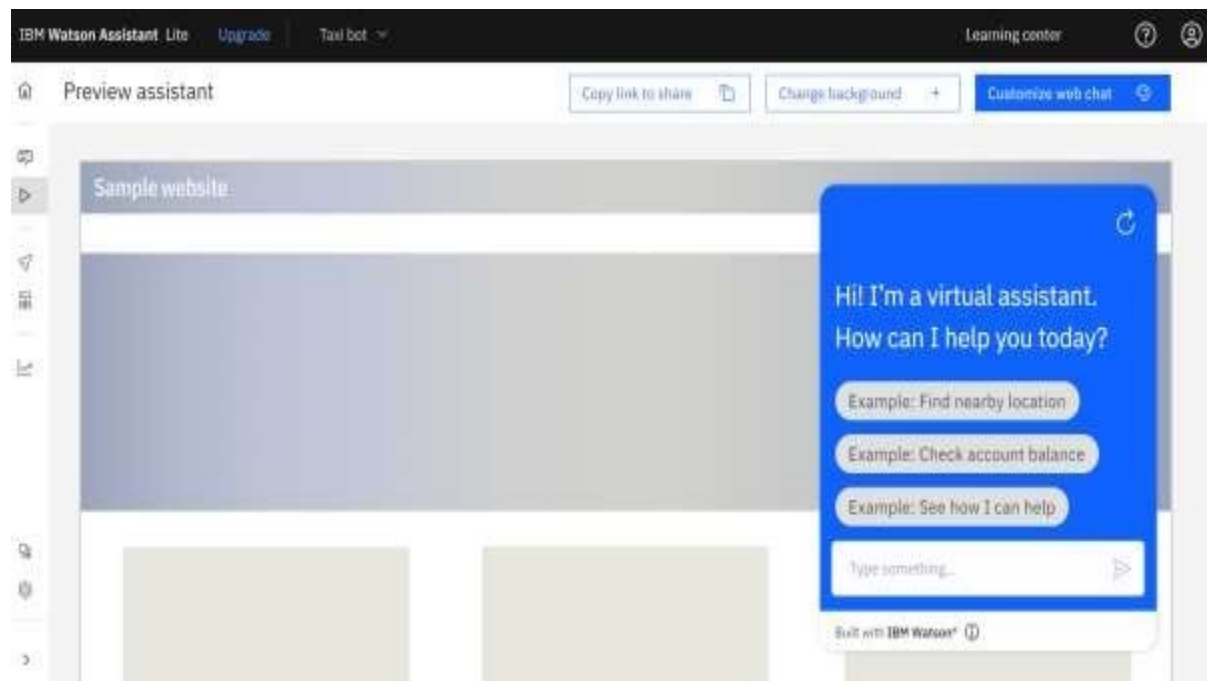
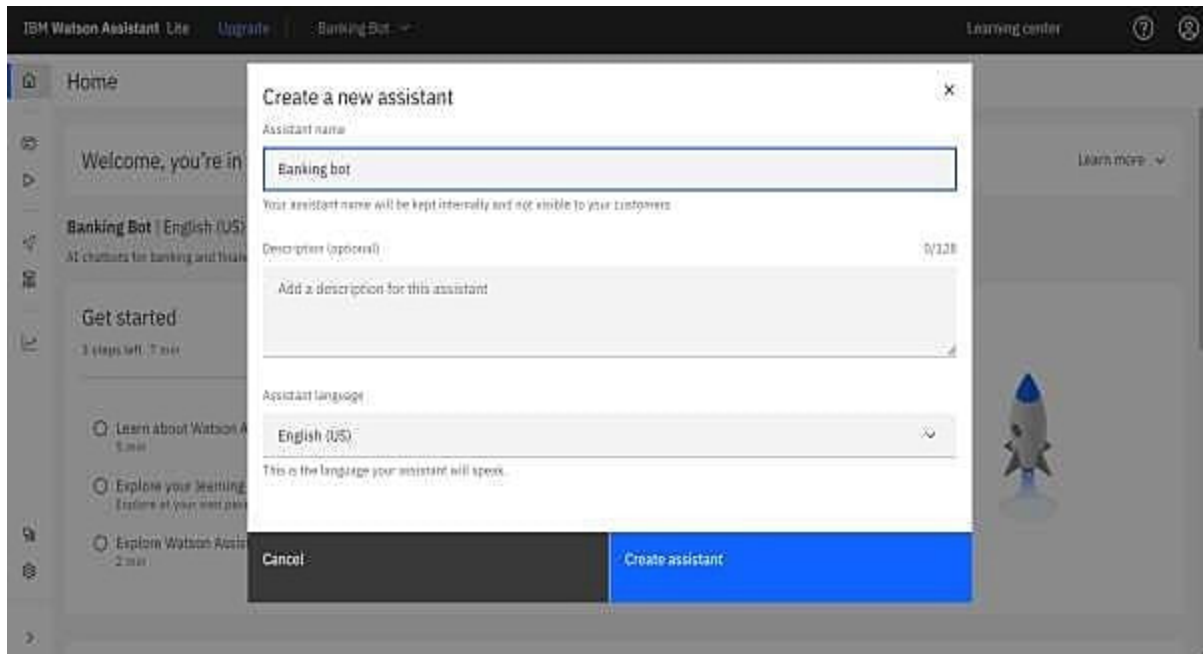


Creating Skills & Assistant For Chatbot

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

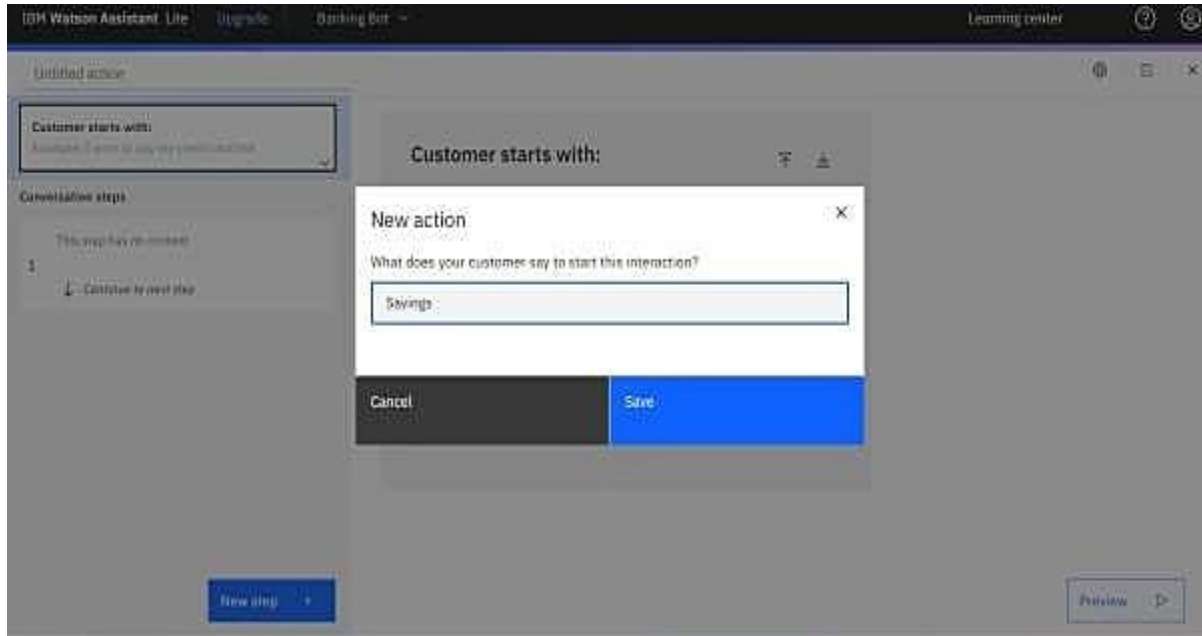


A default template chatbot is created. Need to add actions.

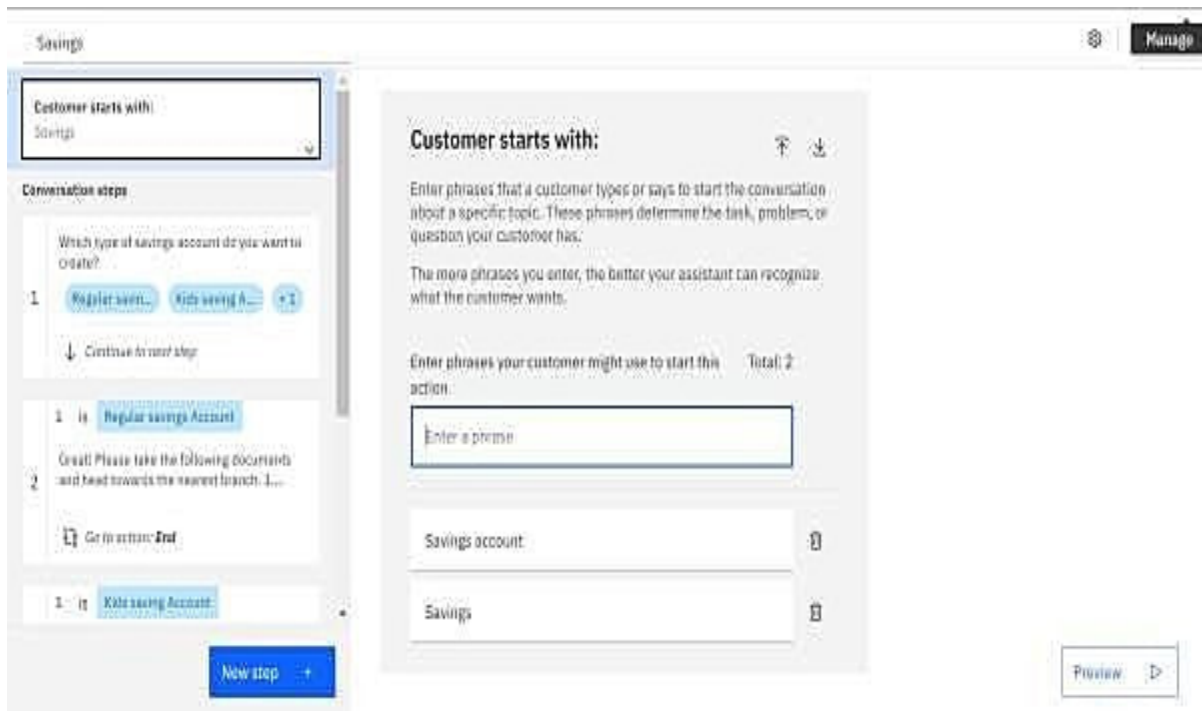


Creating Saving AccountAction

Create a saving account in IBM Watson. Createnew **Action** Saving.

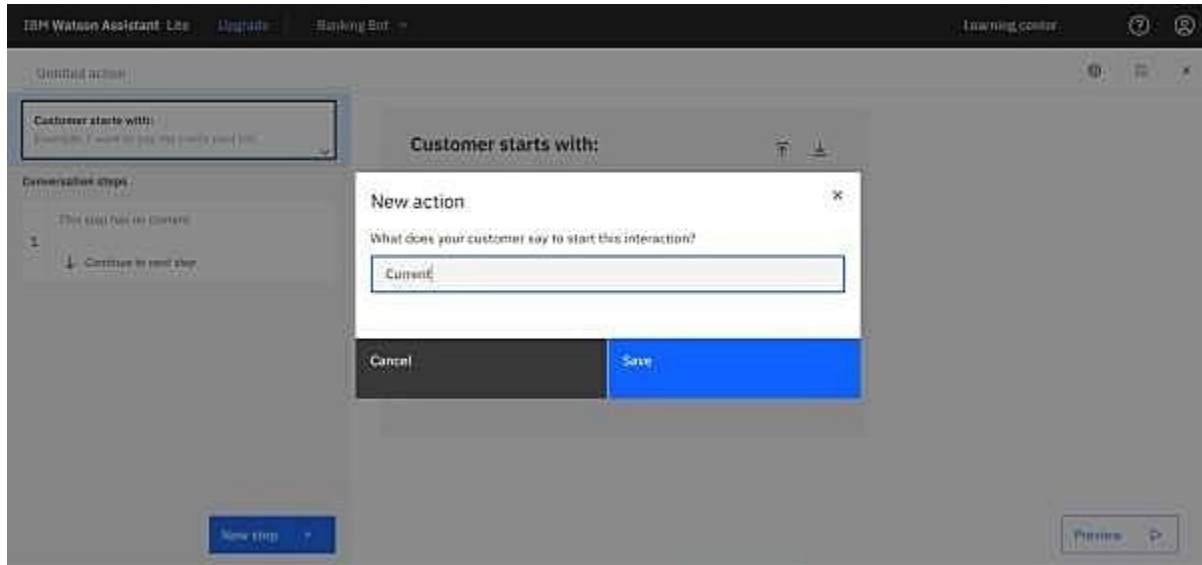


Add steps in savings action.

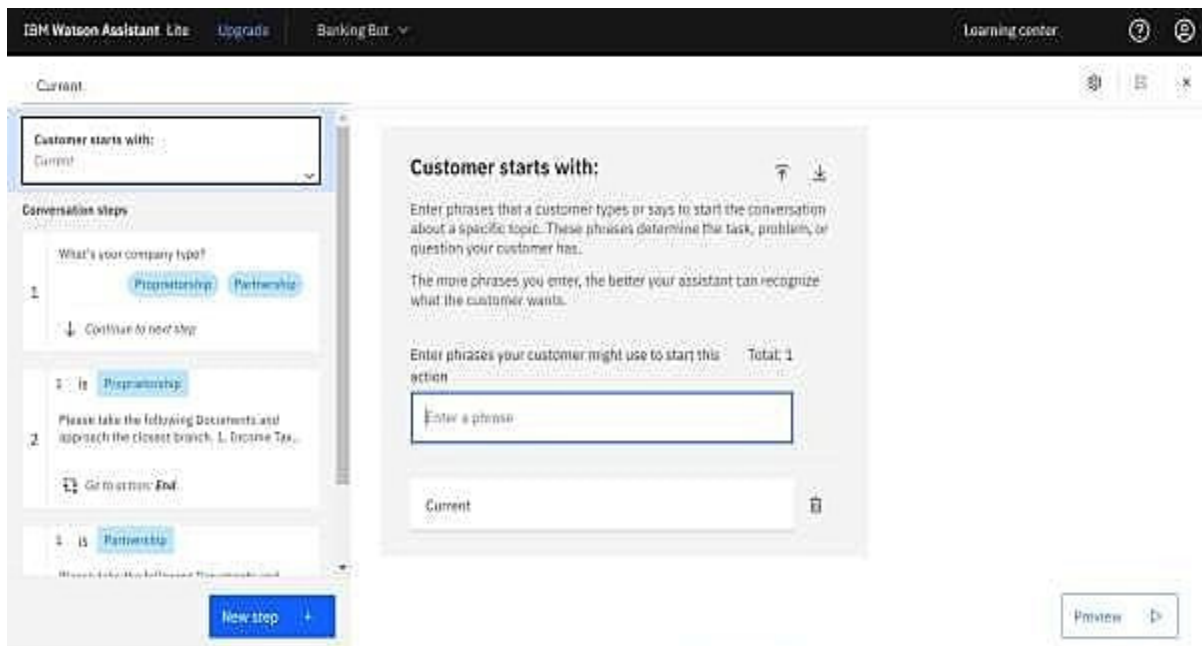


Creating Current Account Action

Create a new **Action** Current for the current account action.



Add steps in current action.



Creating Loan Account Action

Loan action is created with the necessary steps

The screenshot shows the IBM Watson Assistant interface for creating a 'Loan' action. The top navigation bar includes 'IBM Watson Assistant Lite', 'Upgrade', 'Banking Bot', and 'Learning center'. The main header is 'Loan'. On the left, the 'Conversation steps' panel shows a sequence: 1. 'What type of loan are you looking at?' with buttons for 'Vehicle loan' and 'Transport loan'; 2. 'To be eligible for a house loan, please contact our bank service providers with all existing...'; 3. 'Go to action: End'; 4. 'Get a loan'. A 'New step' button is at the bottom. The right panel, 'Customer starts with:', provides instructions on how to define starting phrases and a list of phrases: 'Loan' and 'How to apply loan?'. A 'Preview' button is at the bottom right.

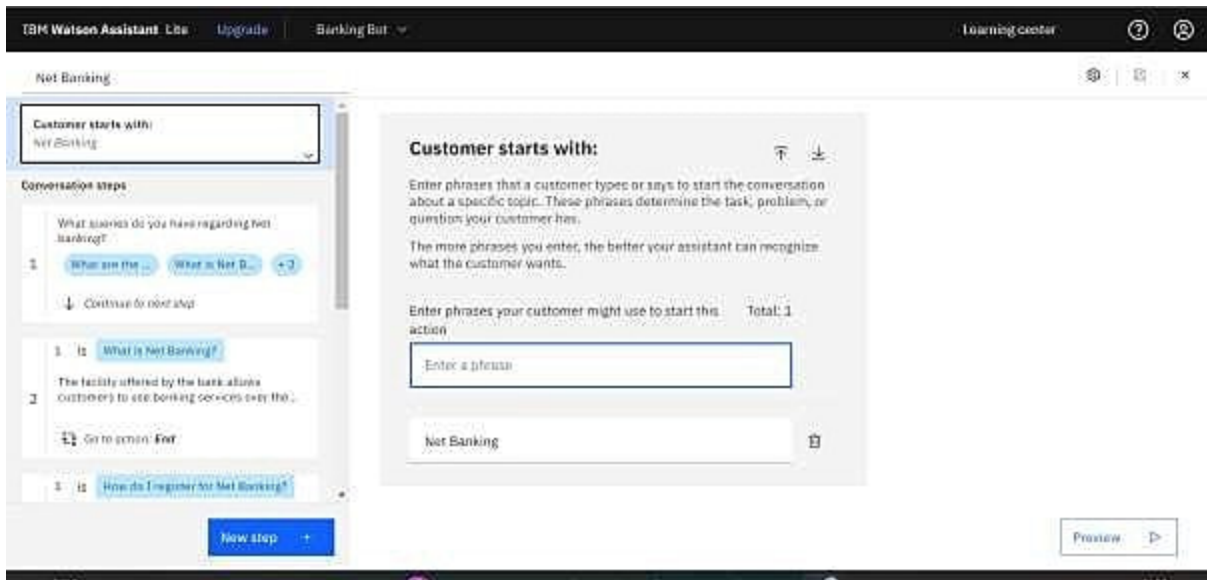
Creating General Query Action

General query action is created with the necessary steps.

The screenshot shows the IBM Watson Assistant interface for creating a 'Query' action. The top navigation bar includes 'IBM Watson Assistant Lite', 'Upgrade', 'Banking Bot', and 'Learning center'. The main header is 'Query'. On the left, the 'Conversation steps' panel shows a sequence: 1. 'Select the general queries listed below' with buttons for 'CIRD' and 'Bank Working...'; 2. 'The bank is open all days from Monday to Saturday from 9 am to 3 pm, with exceptions...'; 3. 'List of branches'. A 'New step' button is at the bottom. The right panel, 'Customer starts with:', provides instructions on how to define starting phrases and a list of phrases: 'Query in general' and 'general'. A 'Preview' button is at the bottom right.














Creating Net Banking Action

Net banking action is created with the necessary steps.



In addition to this greeting, end greeting ,index and end actions are also created.

| New action + | | | |
|--------------|-------------|--------|---|
| Name | Last edited | Status | |
| Current | 2 days ago | ✓ | ⋮ |
| Index | 2 days ago | ✓ | ⋮ |
| Register | 3 days ago | ✓ | ⋮ |
| Greeting | 2 days ago | ✓ | ⋮ |
| End Greeting | 2 days ago | ✓ | ⋮ |

| | | |   New action + |
|----------------------|-------------------|---|--|
| Name | Last edited | Status | |
| Net Banking | 3 minutes ago |  |  |
| End | 2 days ago |  |  |
| Loan | 2 days ago |  |  |
| Query | a few seconds ago |  |  |
| Savings | 16 minutes ago |  |  |
| Current | 2 days ago |  |  |
| Items per page: 50 ▾ | | Showing 1–10 of 10 actions | 1 ▾ 1 of 1 pages   |

Creating Assistant& Integrate With Flask Web Page

You will be creating a 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 general banking queries.
4. The Bot should be able to answer queries regarding net banking.
5. With the help of this bot, you can get all the required details related to banking.

Let us build our flask application which will be running in our local browser with a user interface.

In the flask application, users will interact with the chatbot, and based on the user queries they will get the outcomes.

Build PythonCode

1: ImportingLibraries

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

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

Importing the flask module into the project is mandatory. An object of the Flask class is our WSGI application. Flask constructor takes the name of the current module (`__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 created earlier.

The `'/'` route is bound with the `bot` function. Hence, when the home page of a web server is opened in the browser, the HTML page will be rendered.

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

Main Function

This is used to run the application in local host.

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

Build HTML Code

- We use HTML to create the 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 IBM Watson Assistants is copied and pasted inside the body tag

Run The Application

- Open the anaconda prompt from the start menu.
- Navigate to the folder where your app.py resides.
- 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 navigate me to where you can view your web page.

Source Code:

```
<!DOCTYPE html>

<html>
<head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <title>Keep your money secure with our bank</title>
    <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/css/bootstrap.min.css"
integrity="sha384-
Gn5384xqQ1aoWXA+058RXPxPg6fy4IWvTNh0E263XmFcJlSAwiGgFAW/dAiS6JXm"
crossorigin="anonymous">
    <script src="https://code.jquery.com/jquery-3.2.1.slim.min.js" integrity="sha384-
KJ3o2DKtIkVYIK3UENzmM7KCKRr/rE9/Qpg6aAZGJwFDMVNA/GpGFF93hXpG5Kk
N" crossorigin="anonymous"></script>
```

```
<script src="https://cdn.jsdelivr.net/npm/popper.js@1.12.9/dist/umd/popper.min.js"
integrity="sha384-
ApNbgh9B+Y1QKtv3Rn7W3mgPxhU9K/ScQsAP7hUibX39j7fakFPskvXusvfa0b4Q"
crossorigin="anonymous"></script>
<script src="https://cdn.jsdelivr.net/npm/bootstrap@4.0.0/dist/js/bootstrap.min.js"
integrity="sha384-
JZR6Spejh4U02d8jOt6vLEHfe/JQGiRRSQQxSfFWpi1MquVdAyjUar5+76PVCmYl"
crossorigin="anonymous"></script>
</head>
<style type="text/css">
.dropdown-content {
  display: none;
  position: absolute;
  min-width: 200px;
  box-shadow: 10px 8px 16px 0px rgba(0,0,0,0.2);
  z-index: 1;
}

.dropdown-content a {
  float: none;
  color: black;
  padding: 12px 16px;
  text-decoration: none;
  display: block;
  text-align: left;
}

.dropdown-content a:hover {
  background-color: #ddd;
  color: black;
}
```

```
.dropdown:hover .dropdown-content {  
  display: block;  
}  
.content{  
  background-image: url({ { url_for ('static', filename = 'back.png') } });  
  background-position: center;  
  background-repeat: no-repeat;  
  height: 85vh;  
  min-width: 100%;  
  background-size: cover;  
}  
.info{  
  top: 40%;  
  position: absolute;  
  background-color: #ff9900;  
  border: 3px solid white;  
  border-radius: 100px;  
  border-top-left-radius: 0px;  
}  
.quote{  
  font-size: 24px;  
}
```

```
@media screen and (max-width: 600px) {  
  .info {  
    width:90%;  
    top: 52%;  
    position: absolute;  
  }  
  .quote{  
    font-size: 15px;  
  }  
}
```



```

.content{
  background-image: url({{ url_for('static', filename = 'back2.png') }});
  background-position: center;
  background-repeat: no-repeat;
  background-size: cover;
}
.dropdown-content {
display: none;
position: absolute;
min-width: 200px;
box-shadow: 10px 8px 16px 0px rgba(0,0,0,0.2);
z-index: 1;
}

}

</style>
<body>
<!--Navbar-->

<div class="bg-dark text-light">
<nav class="container navbar navbar-expand-lg navbar-dark bg-dark p-2">
  <p class="navbar-brand mt-2">
    &nbsp;&nbsp; SRP<sup>2</sup> Bank </p>
    <button class="navbar-toggler" type="button" data-toggle="collapse" data-
target="#navbarSupportedContent" aria-controls="navbarSupportedContent" aria-
expanded="false" aria-label="Toggle navigation">
      <span class="navbar-toggler-icon"></span>
    </button>

    <div class="collapse navbar-collapse" id="navbarSupportedContent">

```

```

<ul class="navbar-nav ml-auto">
  <div class="dropdown">
    <li class="nav-item p-3 mt-2 dropbtn">Explore Products</li>
    <div class="dropdown-content bg-light text-dark">
      <a href="#">Accounts</a>
      <a href="#">Loans</a>
      <a href="#">Transactions</a>
      <a href="#">Deposit</a>
      <a href="#">Cards</a>
    </div>
  </div>
  <div class="dropdown">
    <li class="nav-item p-3 mt-2 dropbtn">Make Payments</li>
    <div class="dropdown-content bg-light text-dark">
      <a href="#">Money Transfer</a>
      <a href="#">Bill Payments</a>
      <a href="#">Card Payment</a>
    </div>
  </div>
  <div class="dropdown">
    <li class="nav-item p-3 mt-2 dropbtn">Service Request</li>
    <div class="dropdown-content bg-light text-dark">
      <a href="#">Update Profile</a>
      <a href="#">Saving and Current Account</a>
      <a href="#">Debit and Credit Card</a>
    </div>
  </div>

  <li class="nav-item p-2 ml-2 bg-light" style="border-radius: 30px">
    

```

```
<span class="text-dark typewrite">&nbsp;&nbsp;&nbsp;&nbsp;AI Chat Bot will Help You
&#128071;&nbsp;&nbsp;&nbsp;</span></li>
```

```
</ul>
```

```
</div>
```

```
</nav>
```

```
</div>
```

```
<div class="content container">
```

```
<div class="col-sm-6 info p-4 p-3">
```

```
<center><b class="text-light quote"> “ The art is not in making money, but in keeping it
”</b></center>
```

```
<marquee
```

```
behavior="slide"
```

```
direction="up"
```

```
scrollamount="1"
```

```
class="mt-2"
```

```
>
```

```
<center>
```

```
<p>Money is a terrible master but an excellent servant.</p>
```

```
<p>‘ Keep your money secure with our bank ’</p>
```

```
</center>
```

```
</marquee>
```

```
</div>
```

```
</div>
```

```
<script>
```

```
window.watsonAssistantChatOptions = {
```

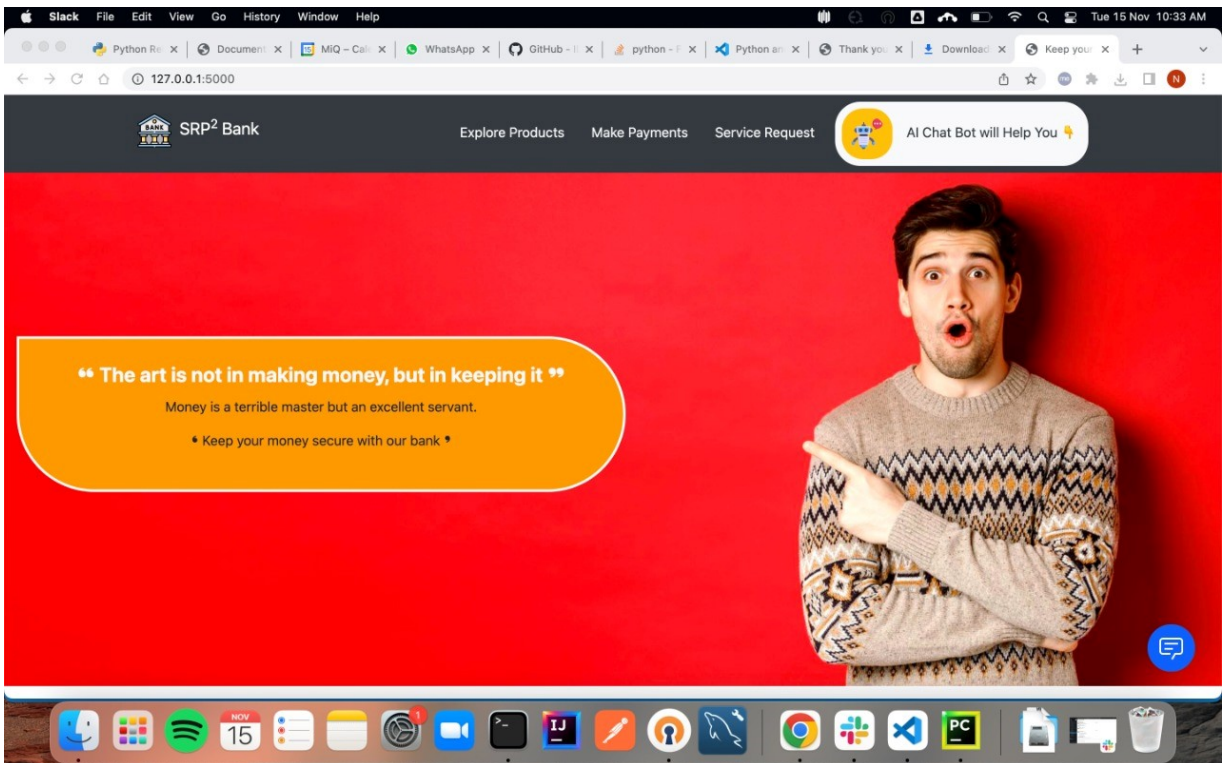
```
integrationID: "508444e6-3d40-4b32-a4bc-75424ab2cd1c", // The ID of this integration.
```

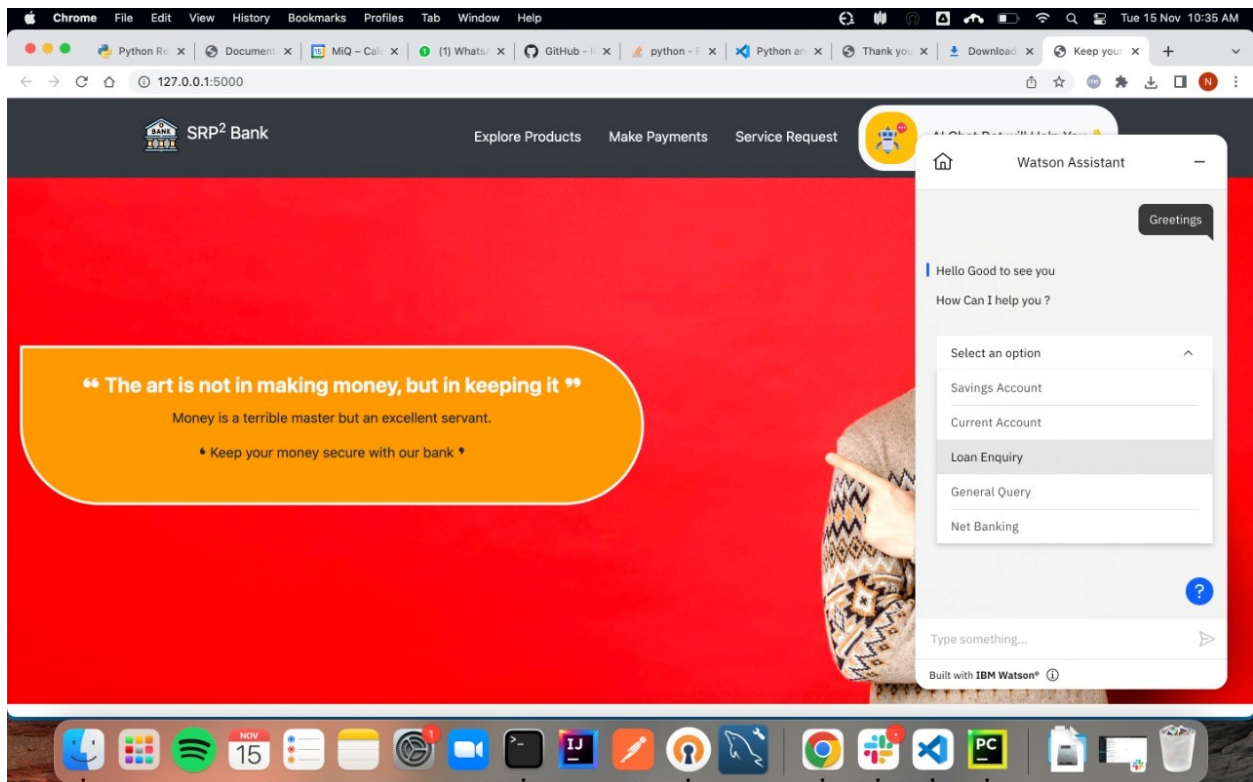
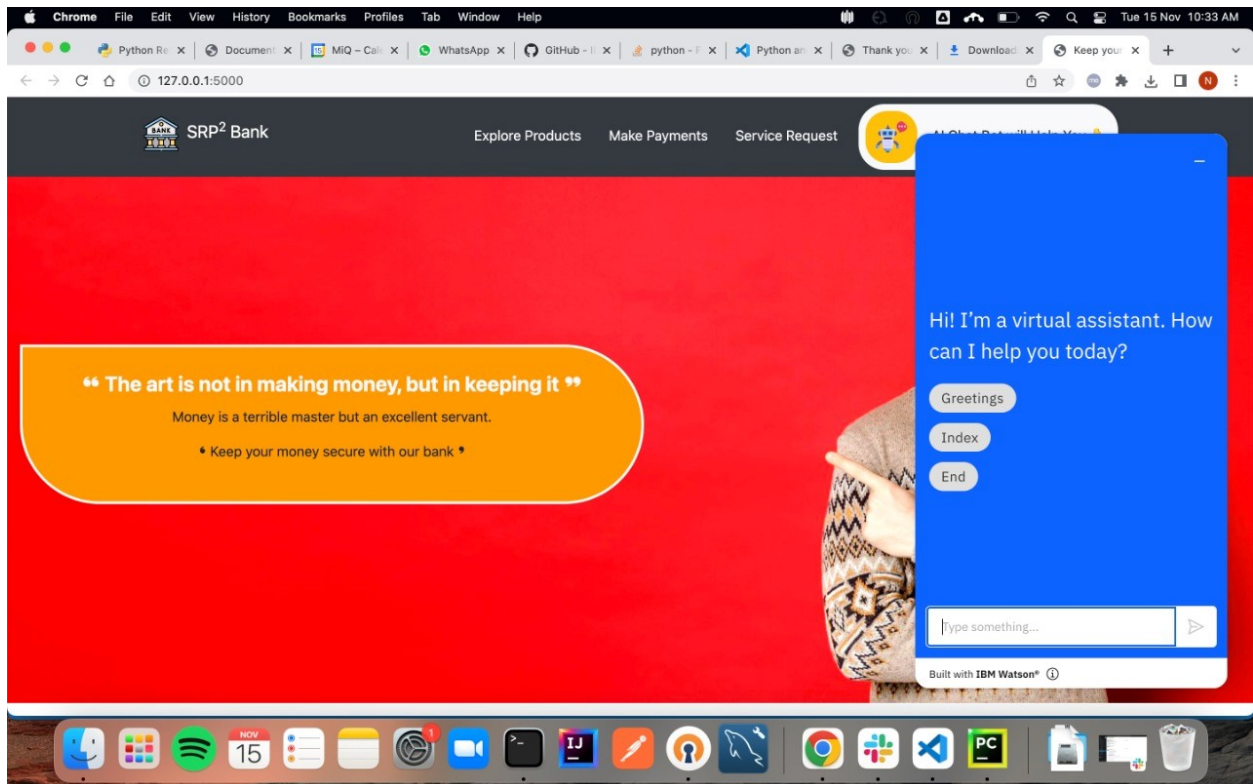
```
region: "au-syd", // The region your integration is hosted in.
```

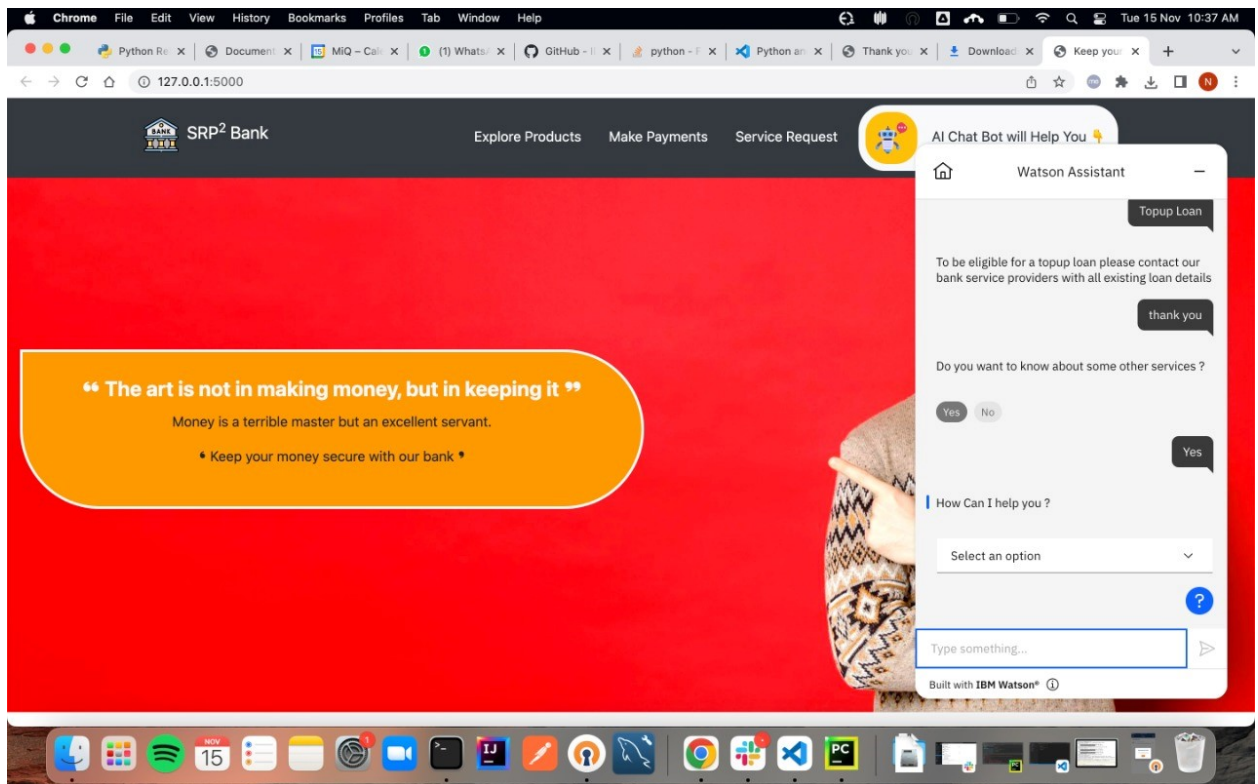
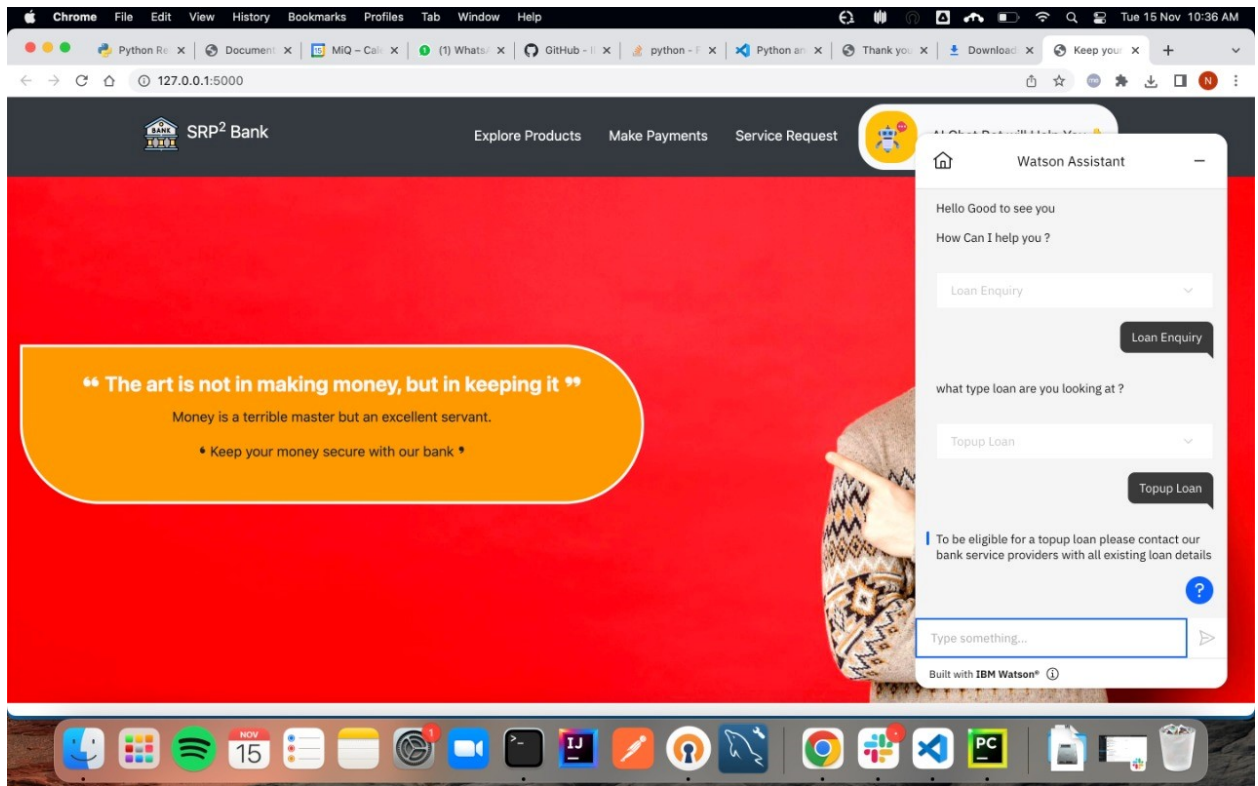
```
serviceInstanceID: "6e1377cd-ed8b-4bd1-8137-5e10d7c41b74", // The ID of your
service instance.
```

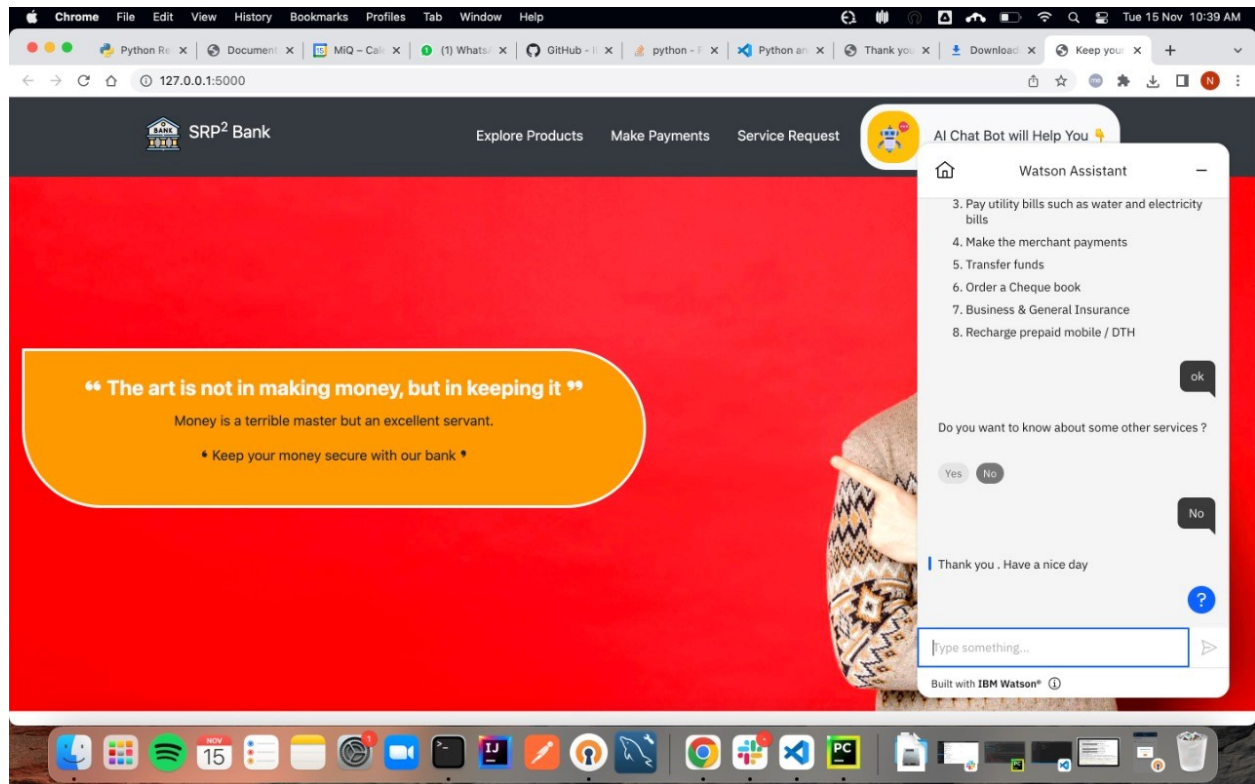
```
onLoad: function(instance) { instance.render(); }  
};  
setTimeout(function(){  
    const t=document.createElement('script');  
    t.src="https://web-chat.global.assistant.watson.appdomain.cloud/versions/" +  
(window.watsonAssistantChatOptions.clientVersion || 'latest') +  
"/WatsonAssistantChatEntry.js";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

OUTPUT:









BANKING CHATBOT:

PROJECT DRIVE LINK :

<https://drive.google.com/file/d/1JpXCnSL6L26CAwf2ZXHiGUFRo9jJMxS/view?usp=sharing>

REFERENCE:

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environments: the FIT-EBot, a chatbot for administrative and learning support." In Proceedings of the ninth international symposium on information and communication technology, pp. 69-76. 2018.

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<https://www.juniperresearch.com/press/chatbots-a-game-changer-for-banking-healthcare>.
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