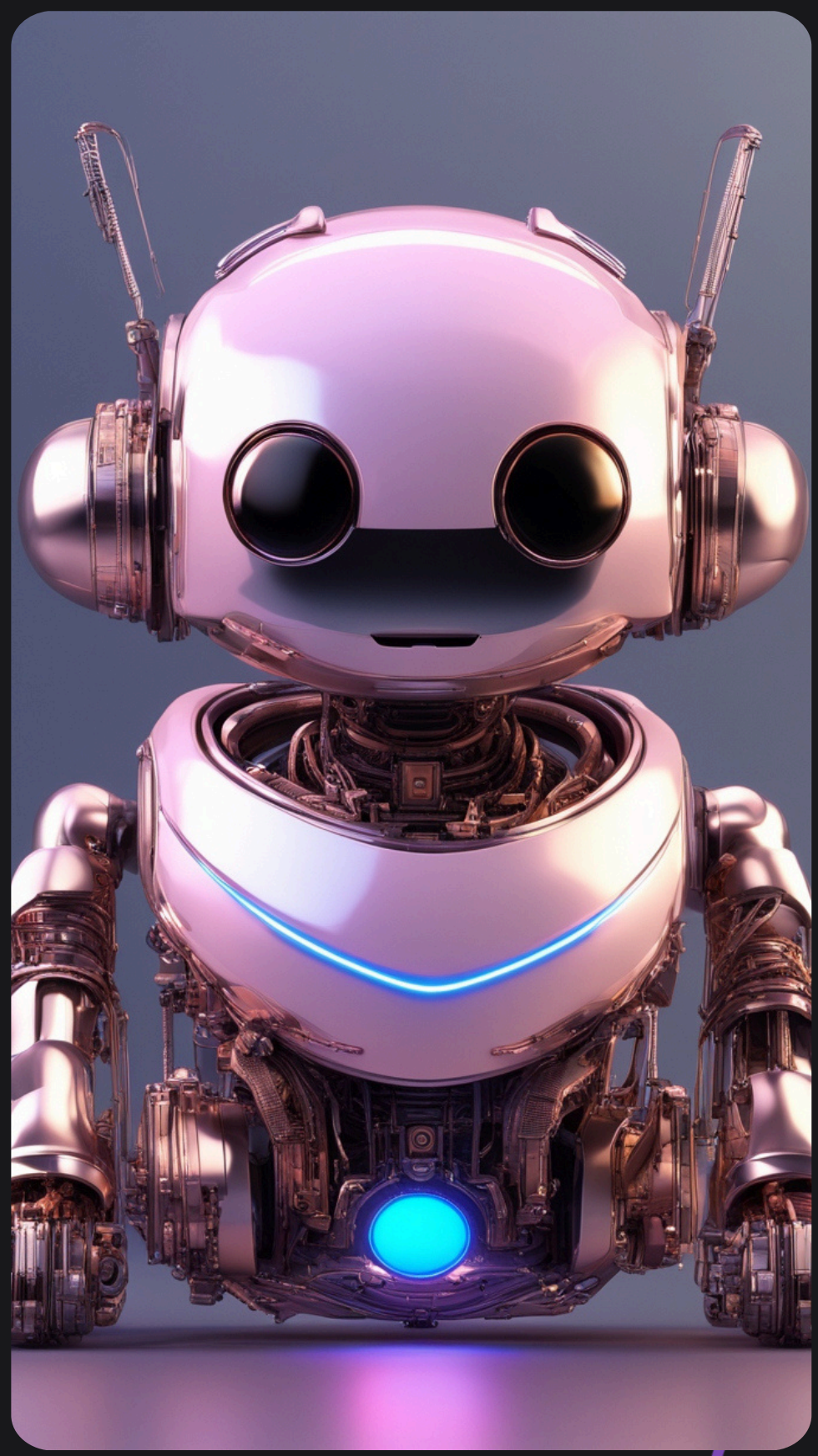
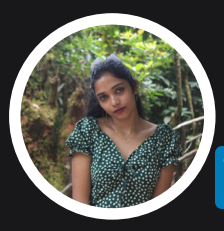
NEXTWORK

How I built a chatbot with Amazon Lex





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What is Amazon Lex?

What is Amazon Lex?

- Amazon Lex is a service for building conversational interfaces into applications using voice and text. It provides deep learning functionalities to recognize the intent of the text and respond appropriately.

What it does:

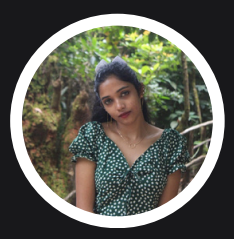
- The Amazon Lex chatbot, named "BankerBot," is designed to interact with users and provide banking-related services such as checking balances and transferring funds.

Why it's useful:

- The chatbot automates customer service tasks, reduces the need for human intervention, and provides quick and accurate responses to user queries.

How I'm using it in today's project:

- In this project, I used Amazon Lex to create a chatbot that can handle banking inquiries and transactions. The chatbot is integrated with AWS Lambda for enhanced functionality.



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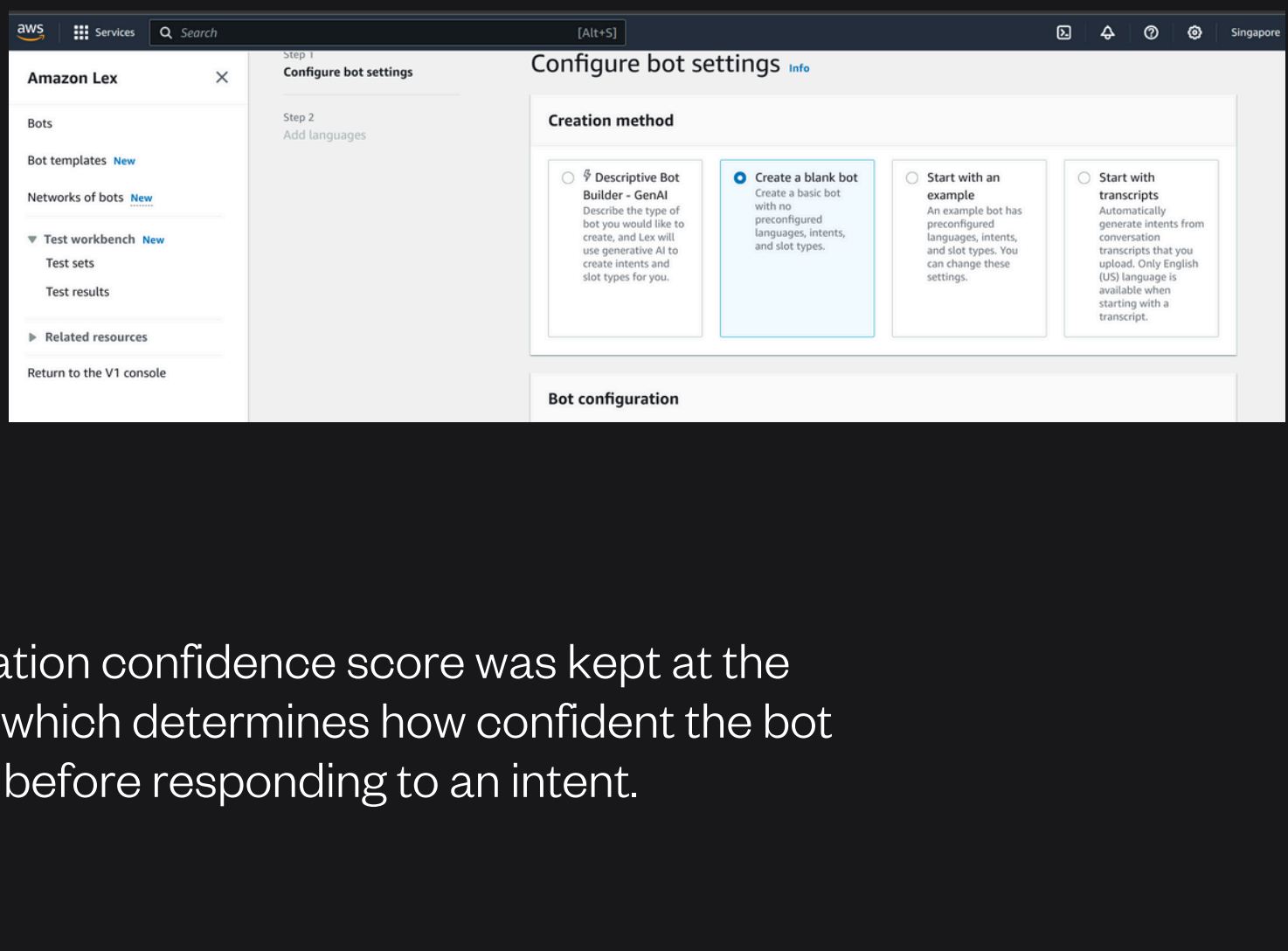
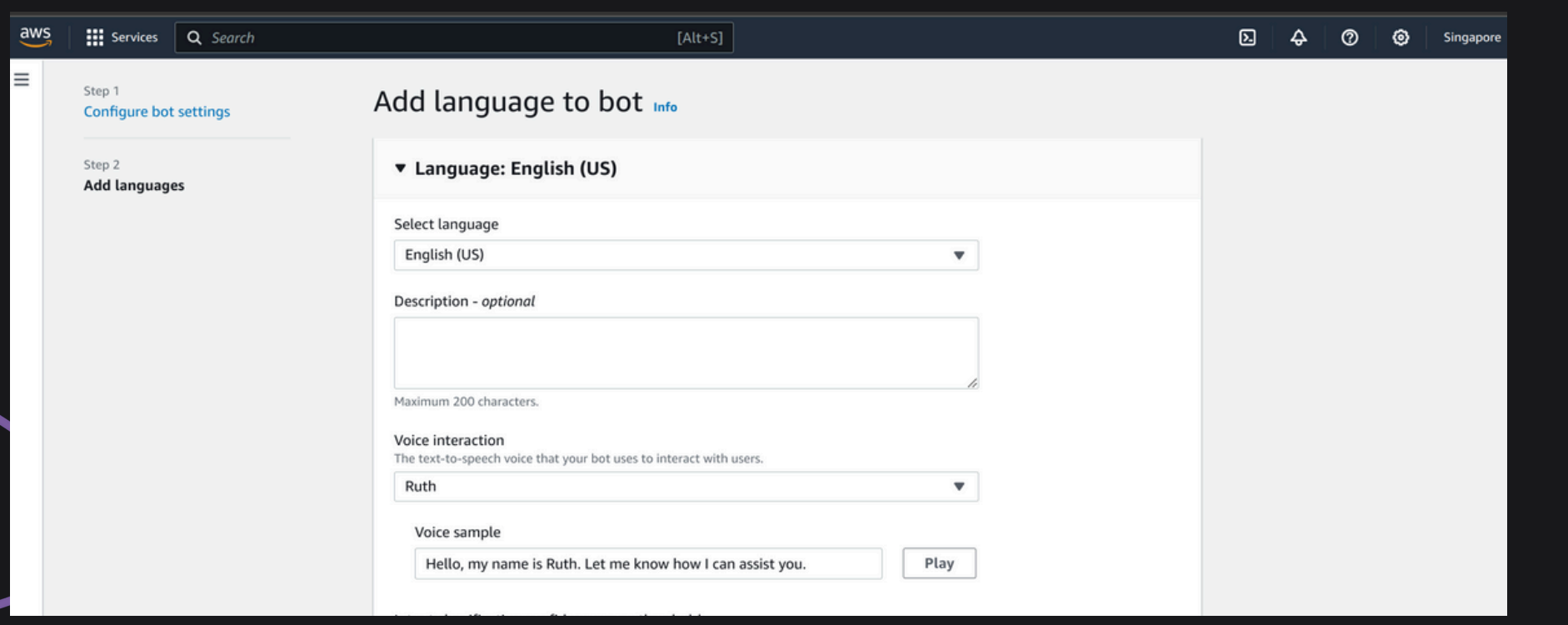
Set up a Lex chatbot

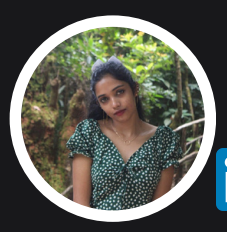
- I created BankerBot from scratch and used most default settings on Lex.



- The intent classification confidence score was kept at the default value of 0.40, which determines how confident the bot needs to be before responding to an intent.

Setting up my Lex chatbot...





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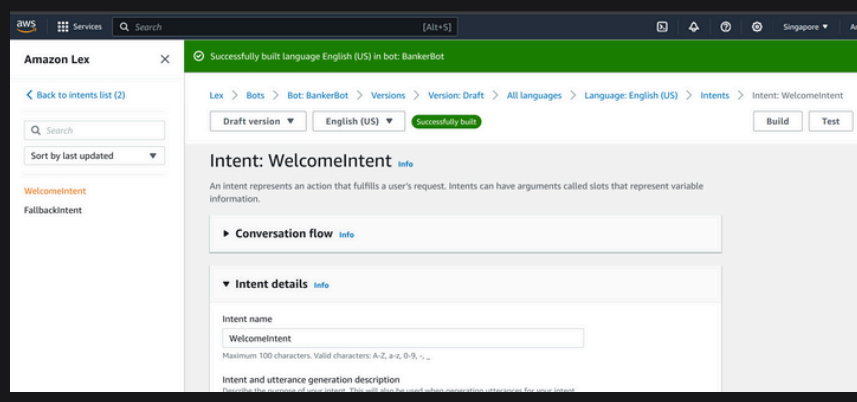
Create an intent in Lex

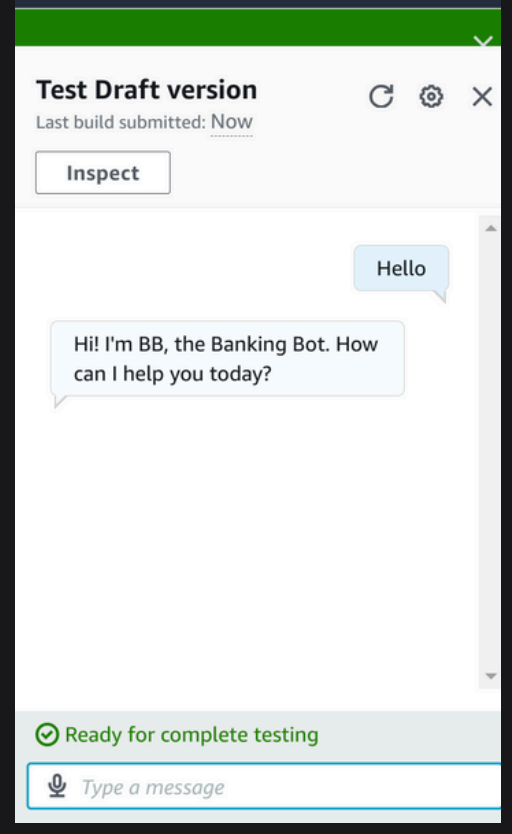
- Intents are predefined goals or actions that the chatbot is designed to fulfill.

- My first intent, "WelcomeIntent," was created to greet users and initiate interaction.



- **Steps to create "WelcomeIntent":**

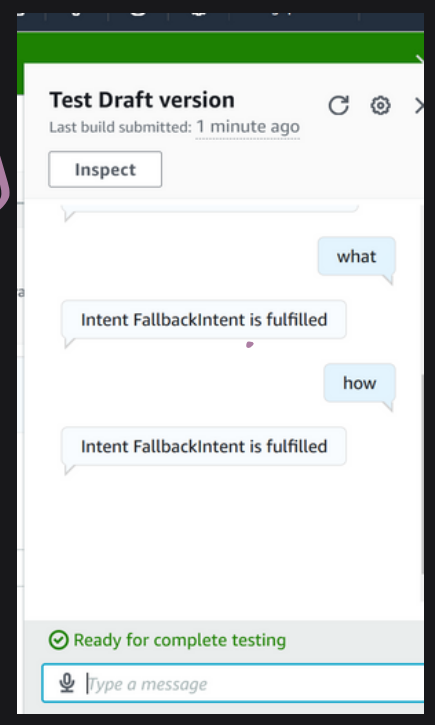
1. Go to the Amazon Lex console.
2. Create a new intent named "WelcomeIntent."
3. Add sample utterances such as "Hello," "Hi," and "Good morning."
4. Save the intent and build the model.
5. Test the chatbot to ensure it responds correctly to the greetings.

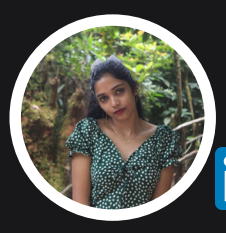


My first test of the chatbot

- **Error Handling:**

During testing, the chatbot returned the error message "Intent FallbackIntent is fulfilled" when certain inputs were entered. This error occurred because the input did not match any of the defined intents, triggering the FallbackIntent.





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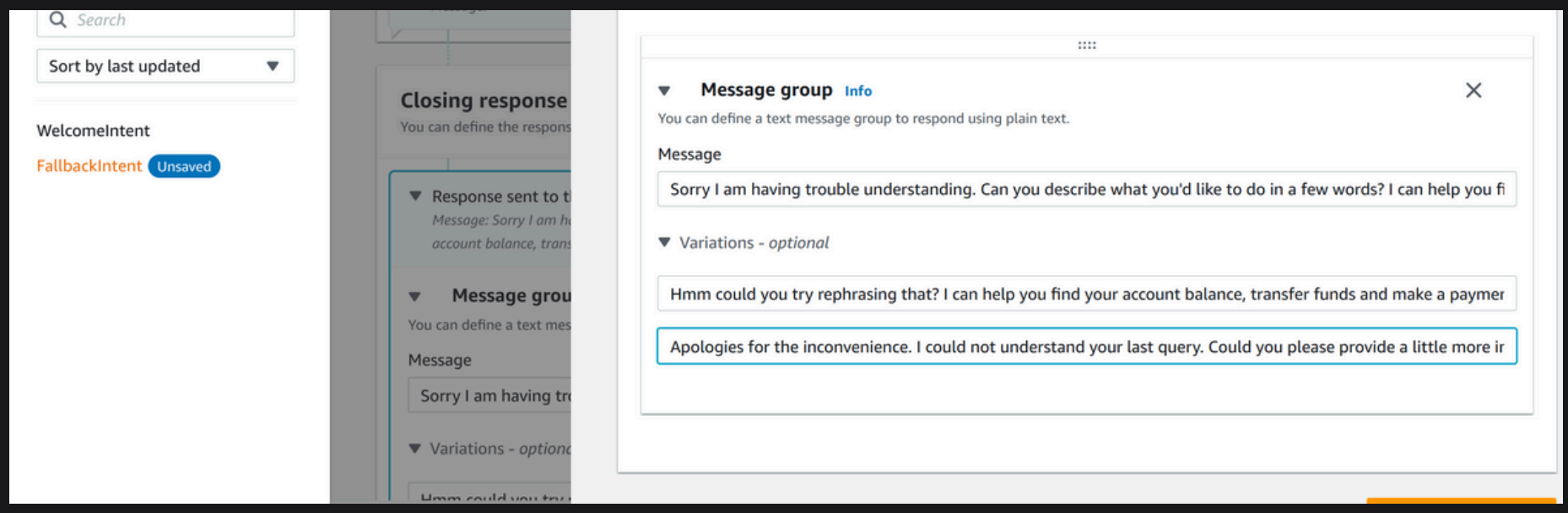
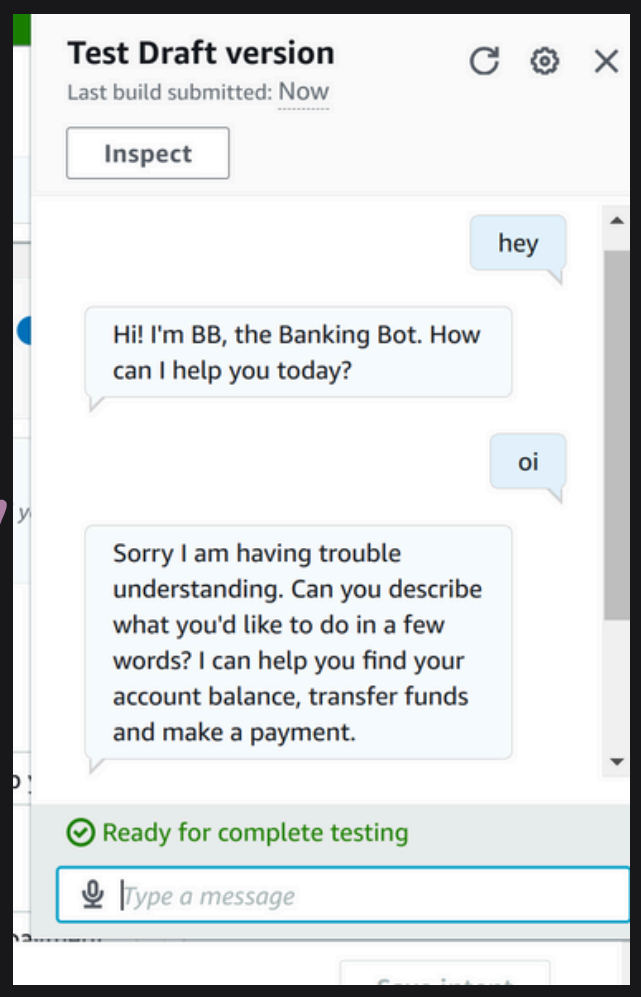
Manage FallbackIntent

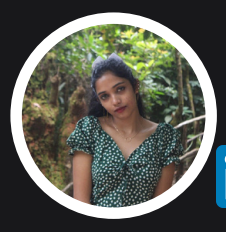
- The FallbackIntent is a default intent that gets triggered when the chatbot cannot match an input to any existing intents.



- Steps to configure FallbackIntent:
  1. Open the FallbackIntent in the Lex console.
  2. Customize the response messages to provide clearer instructions to the user.
  3. Add variations to the responses to improve user experience.



Perfect! The error message is now much clearer, and there are variations too



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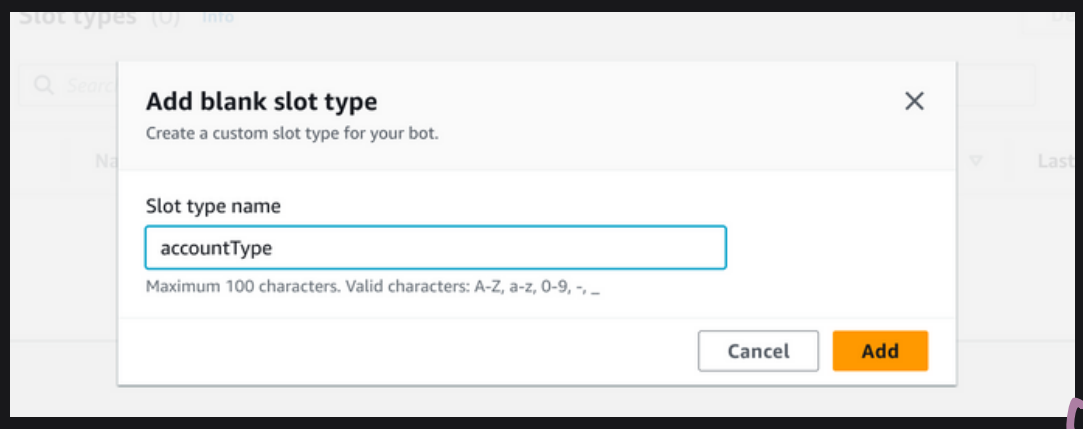
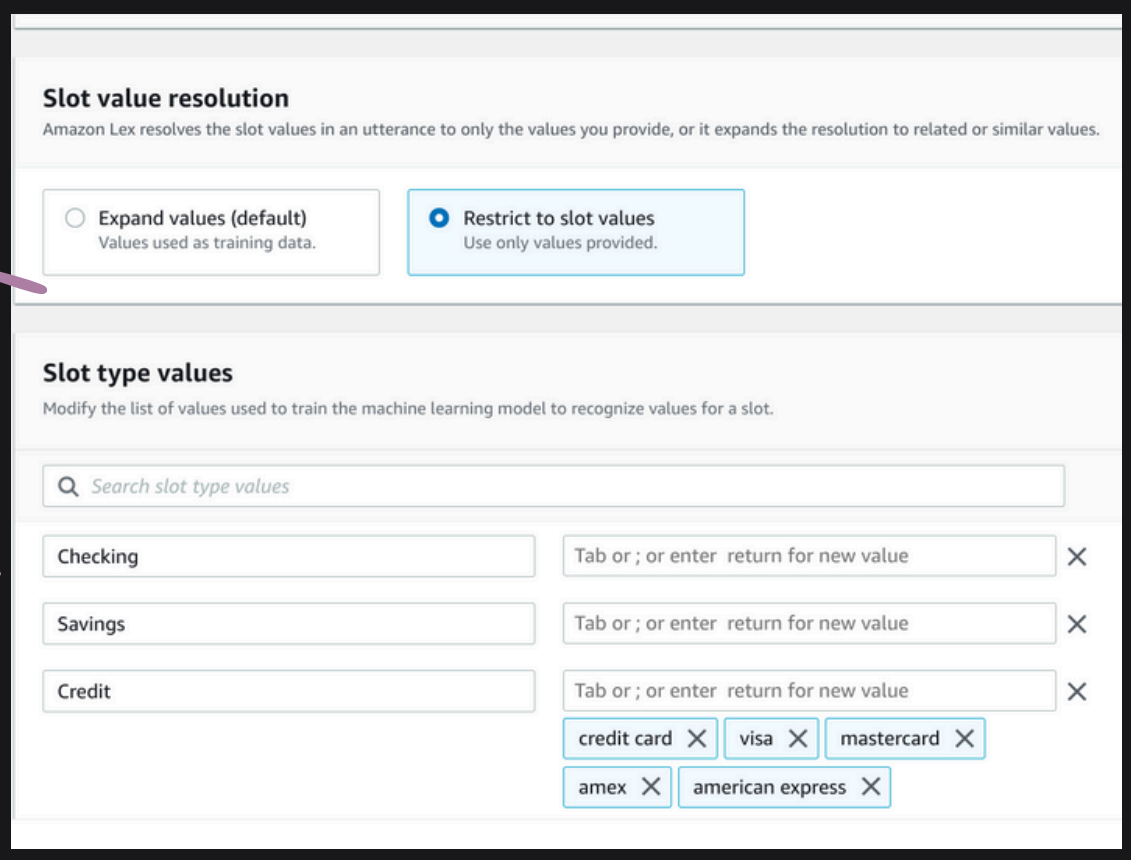
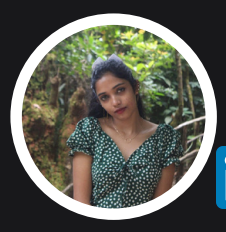
Create custom slots

- Slots are used to capture and store information provided by the user.



- Create a new slot type called "AccountType" with values like "savings," "checking," and "business."
- Associate the custom slot with the "CheckBalance" intent to capture the type of account the user wants to check.





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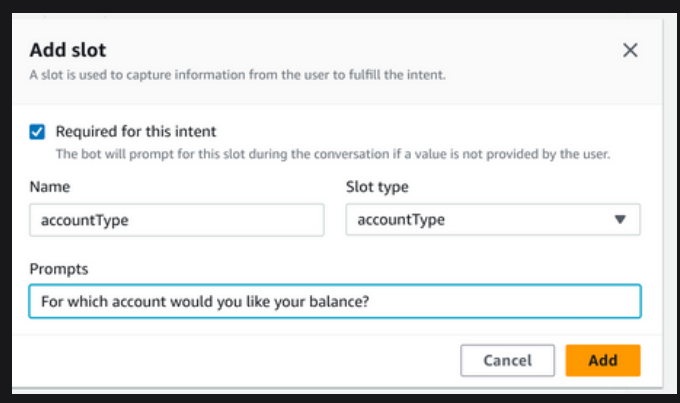
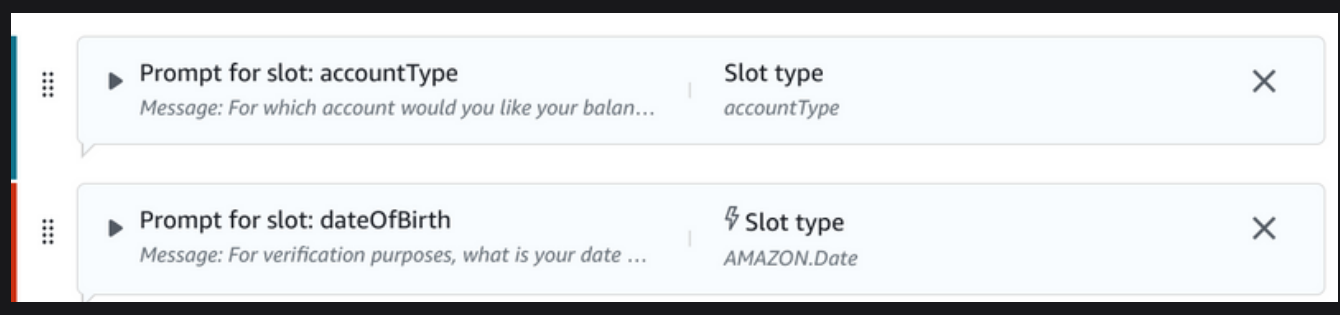
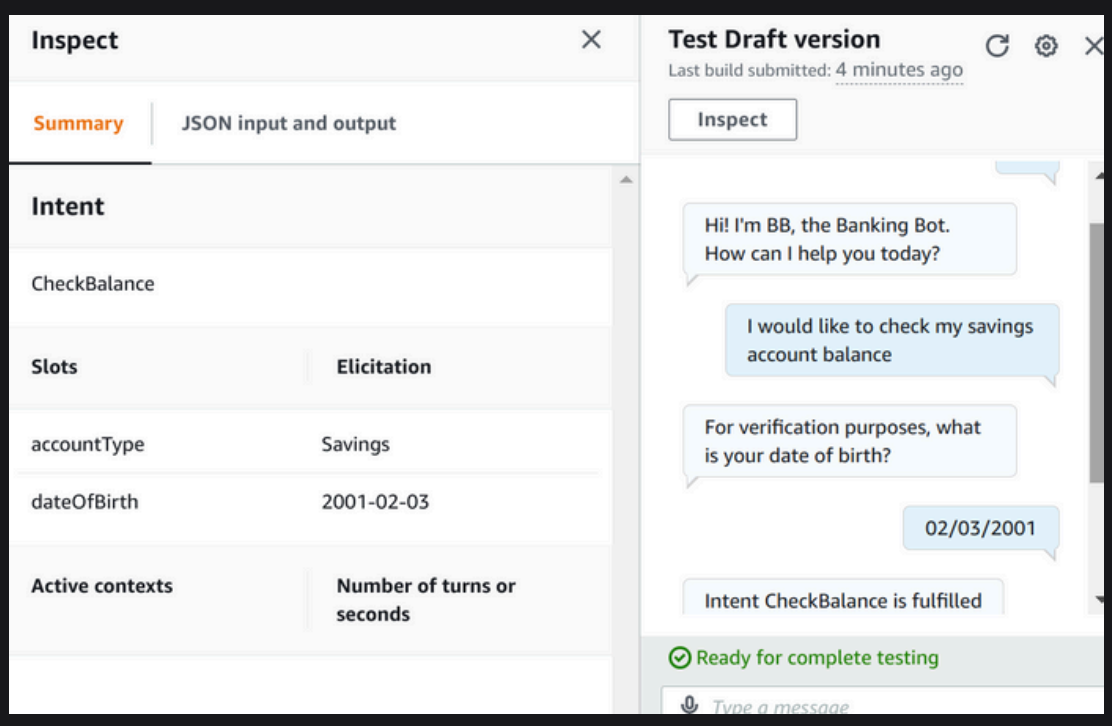
Simplifying the user experience

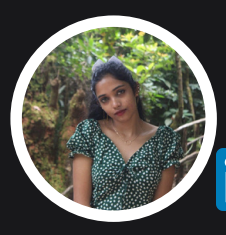
- Including slot values in the utterances can make the interaction smoother by reducing the number of questions the bot needs to ask.



- By adding the account type directly in the user's input, the chatbot can skip asking for it separately.







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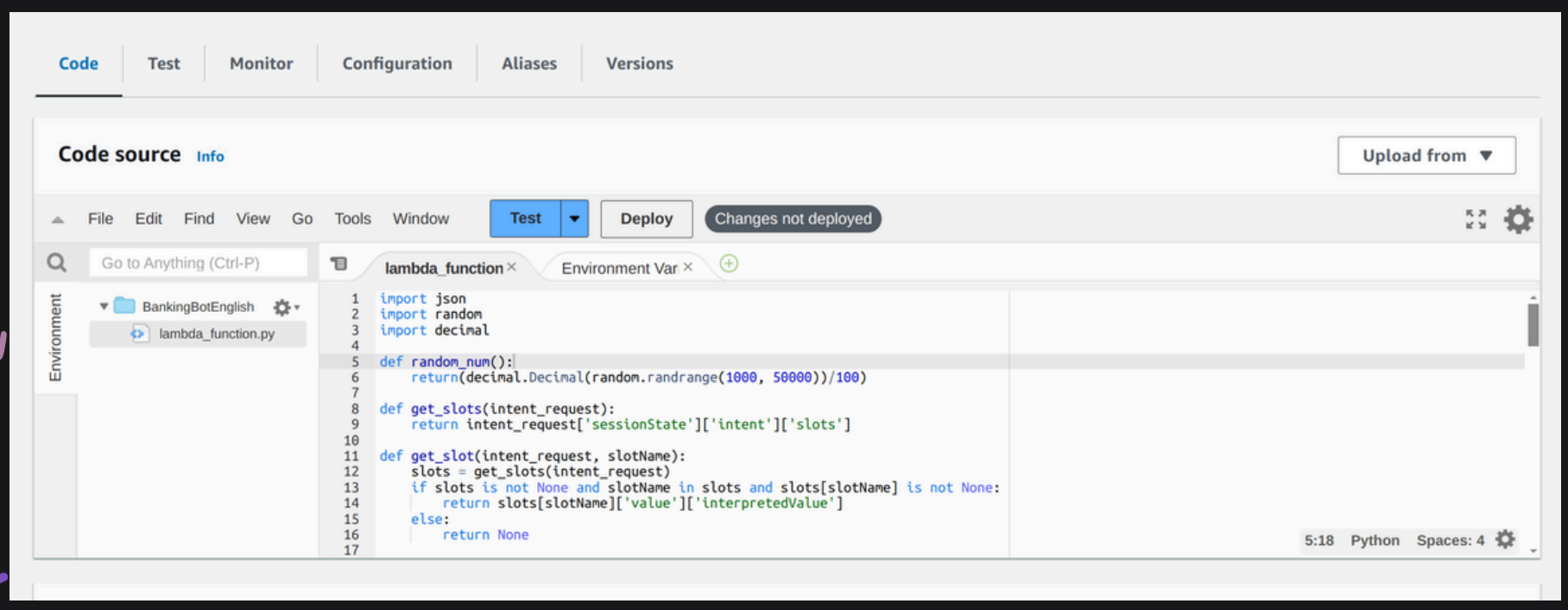
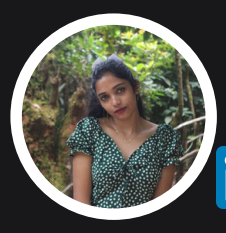
Using AWS Lamba

- AWS Lambda is a service that allows you to run code without provisioning or managing servers.
- In this project, I created a Lambda function named "BankingBotEnglish NextWork.py" to handle backend processes that the chatbot alone cannot manage, such as accessing account balances.

A peek into the Python code I uploaded into AWS Lambda!





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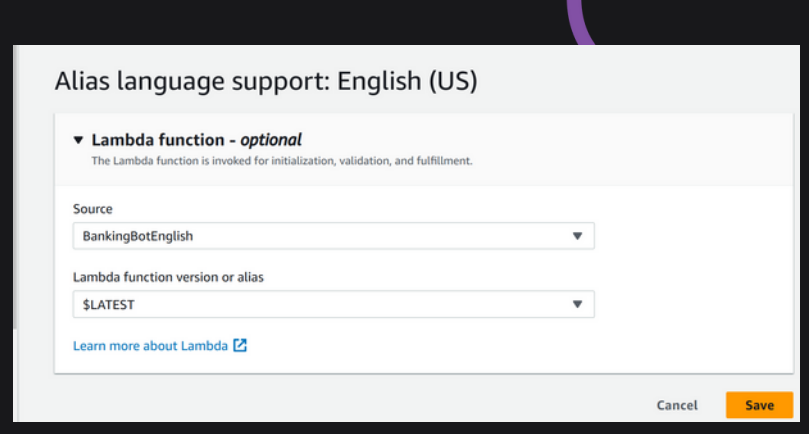
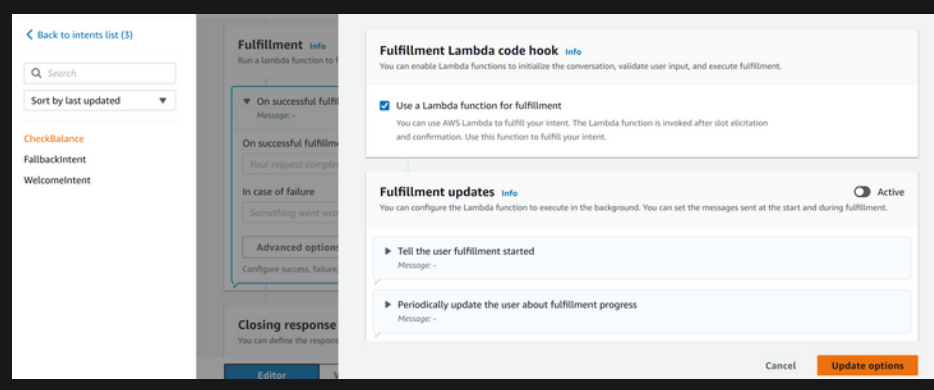
Connecting Lambda with Lex

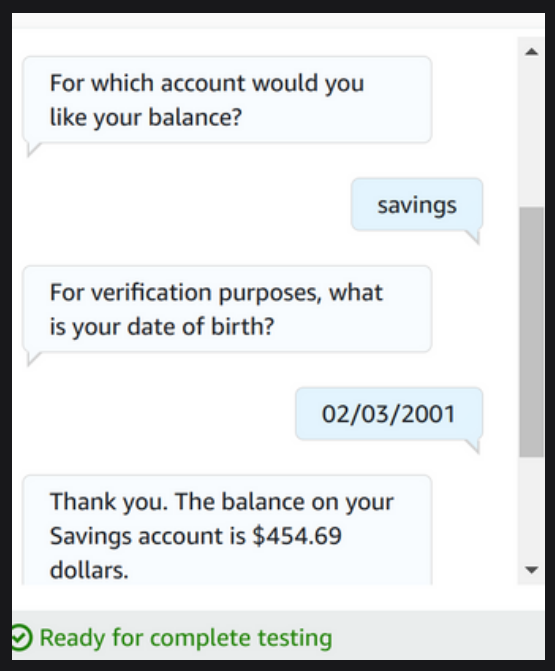
To connect the Lambda function with the Lex chatbot, two main steps were required:

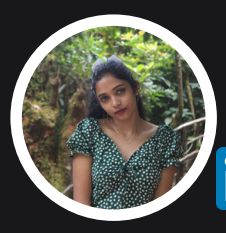
- Step 1:
  a. Go to the Lex console and select the chatbot.
  b. Navigate to the "Alias" section and associate the Lambda function with the chatbot alias.
- Step 2:
  c. Configure code hooks in the intent settings.
  d. Code hooks allow the chatbot to invoke the Lambda function during the conversation flow.





My chatbot now returns a bank balance number thanks to Lambda!





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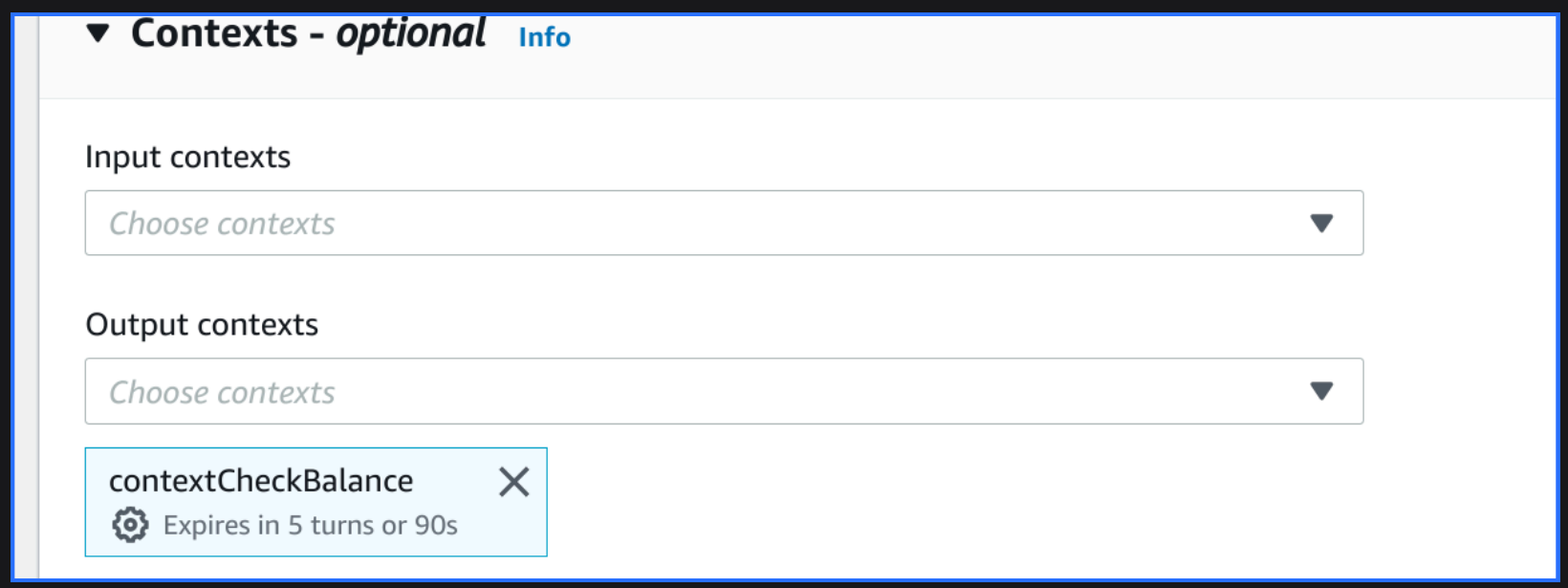
Context Tags

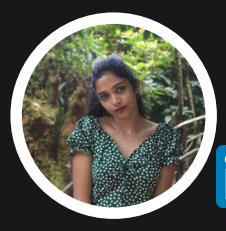
- Context tags are used to manage the conversation flow and maintain context between different intents.

- Types of context tags:
  a. Output context tags: Set when an intent is fulfilled and passed to the next intent.
  b. Input context tags: Required for an intent to be triggered.

- Example: I created an output context tag called "contextCheckBalance" in the "CheckBalance" intent.

A look at output contexts





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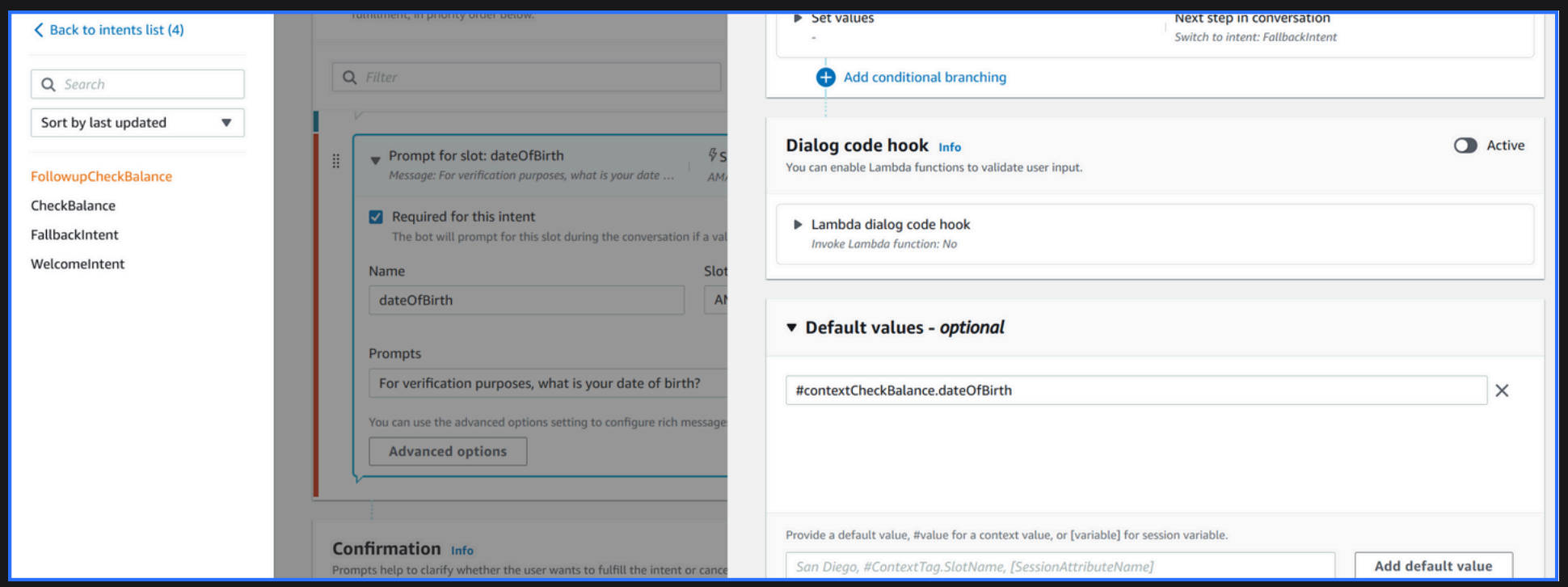
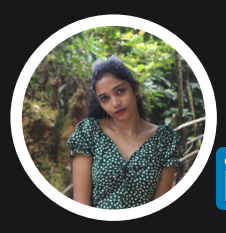
A Follow-Up Intent

- The "FollowupCheckBalance" intent was created to handle additional user queries after checking the balance.

- Relationship with "CheckBalance": This intent is triggered based on the context set by the "CheckBalance" intent, allowing the chatbot to maintain continuity in the conversation.

A look at input contexts





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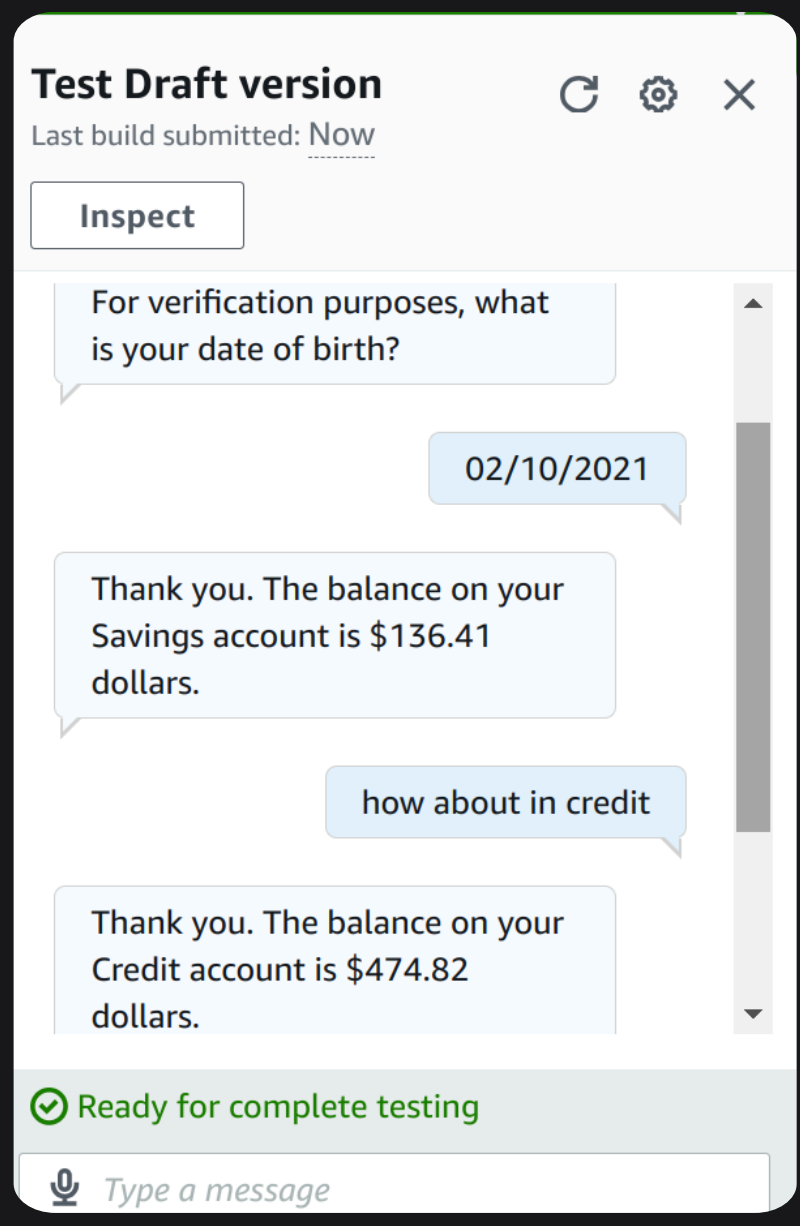
Context Tags in Action

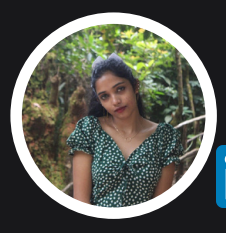
- Conversation time! I built and tested my bot after creating the context tags and new intent.

- To see the context tags and the follow up in intent in action, I will have to trigger the intent by asking for another account balance the second time, to see if the bot will ask for the DOB again.

- Without setting the context, the bot would not understand the follow-up request.

My chatbot now carries over the user's date of birth to the next intent!





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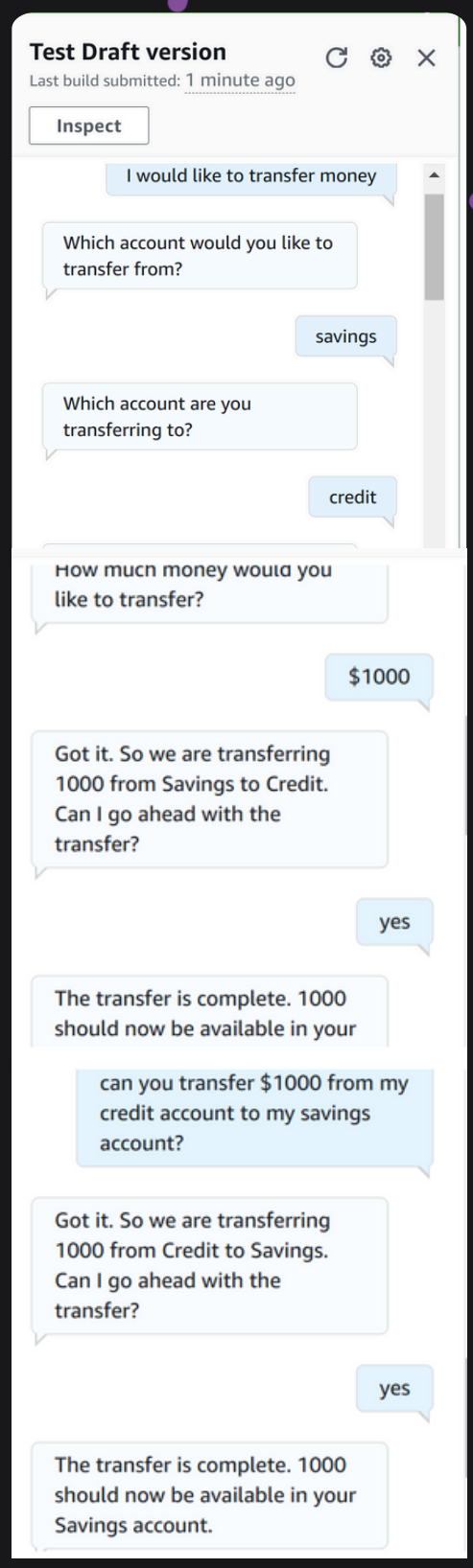
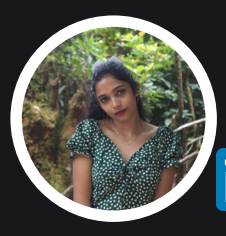
More slots!

- Slots are used to capture and store information provided by the user.
- The final intent, "TransferFunds," uses multiple slot types to capture information about the transfer.
- For this intent, I had to use the same slot type twice. Multiple slots can have the same slot type, so it's super important that you're using clear slot names that make it easier to identify their differences.
- I also learned how to create confirmation prompts. Confirmation prompts are used to verify user input before performing actions.



A conversation demonstrating the two slots and the confirmation prompts in action!



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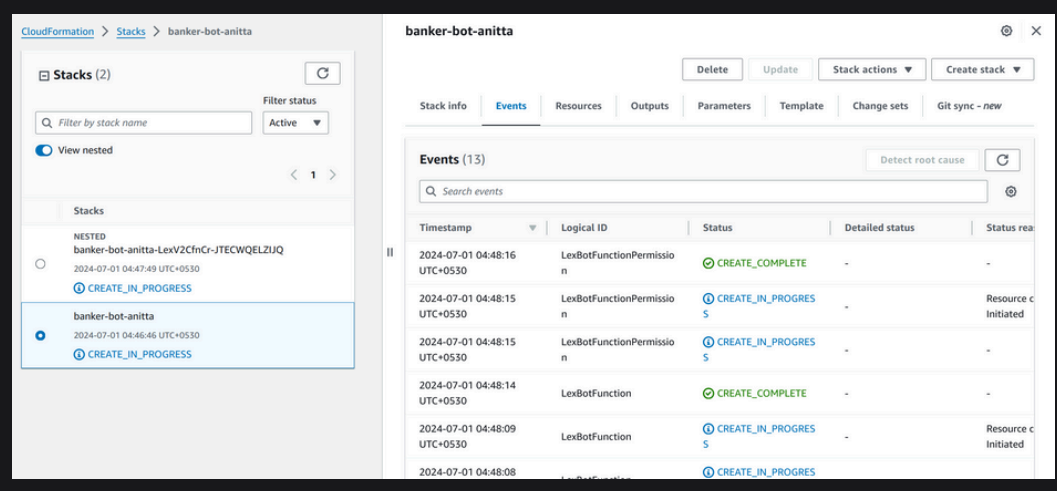
A LITTLE EXTRA...

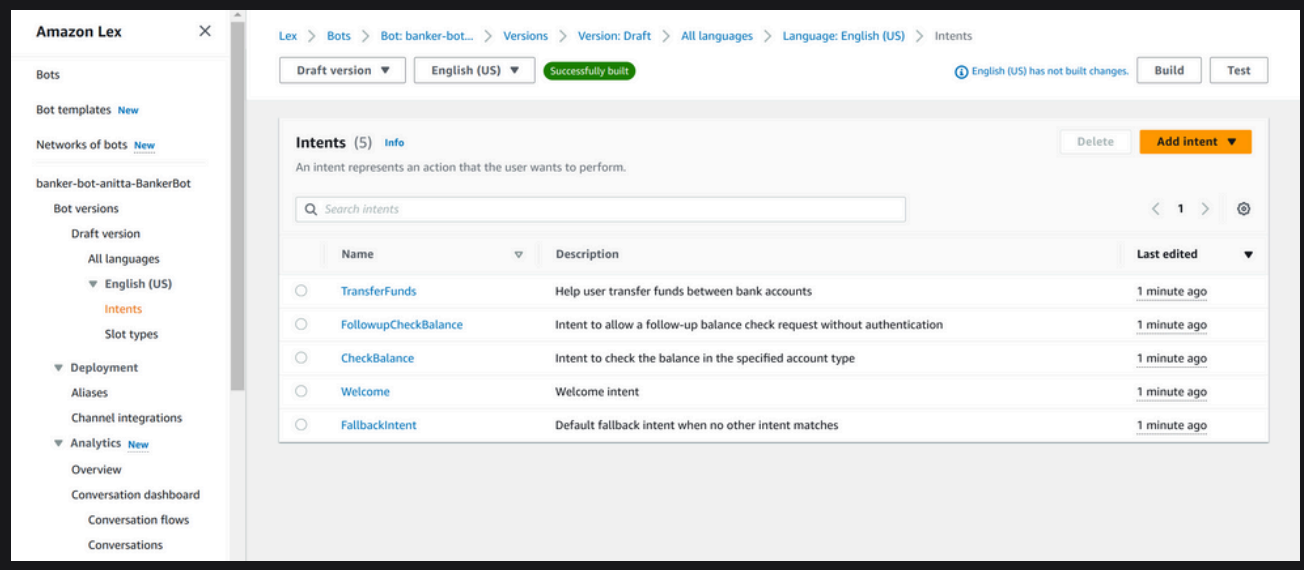
Deploying with CloudFormation

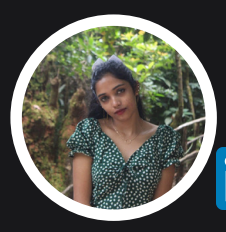
- AWS CloudFormation is a service that gives you an easy way to create and set up AWS resources. It is an infrastructure as code service - meaning you will create a CloudFormation template that describes all the resources you want to create and their dependencies as code.
- As an extension to this project, I learned how to deploy the entire BankerBot using a single CloudFormation stack.
- Doing this took me just around 10 minutes.
- Something I learned from deploying with CloudFormation was how easy and time-saving it is to just use cloudformation.

- We still have to do some troubleshooting after deploying with Cloudformation. But that's a story for another day. 👋



CloudFront deployed this for me!





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My Key Learnings

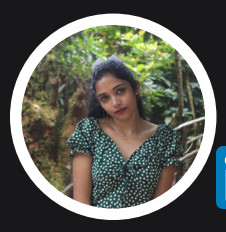
01 Amazon Lex: A service for building conversational interfaces using voice and text.

02 Intents: Predefined goals or actions that the chatbot fulfills.

03 AI/ML: Used in Lex to understand user input and respond appropriately.

04 FallbackIntent: A default intent triggered when no other intents match the input.

05 CloudFormation makes life easier 😉



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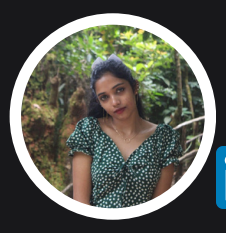
Final thoughts...

- This project took me 2 hours to complete, and documentation took 1 more hours.

- **What's next?** In the next phase of this project, I'll be adding a new flow that lets users check their account balances and verify their identity with their birthday. I'll be creating a custom slot type to handle the different bank account types. Excited to bring this feature to life and make our BankerBot smarter and more interactive! 🚀👀



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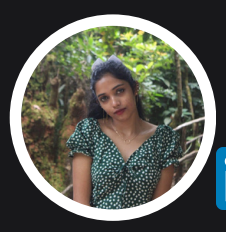
ERROR! 👀 *OMG!!!*

An error I ran into was...

- Could not trigger "FollowupCheckBalance" intent after following all steps.
- ✅ I noticed that I had accidentally added the context "contextCheckBalance" in the output context for this intent. I solved this error by changing it to an input context.



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