Designing an Amazon Lex Chatbot

Overview

This document outlines the steps to design and implement an Amazon Lex chatbot, particularly a banking bot named **TrustVault**. This bot enables users to interactively access banking services such as checking account balances, transferring funds, and making payments.

What is Amazon Lex?

Amazon Lex is an AWS service for building conversational interfaces using voice and text. It provides the advanced functionalities of natural language understanding and automatic speech recognition.

Key Features of the TrustVault Banking Bot

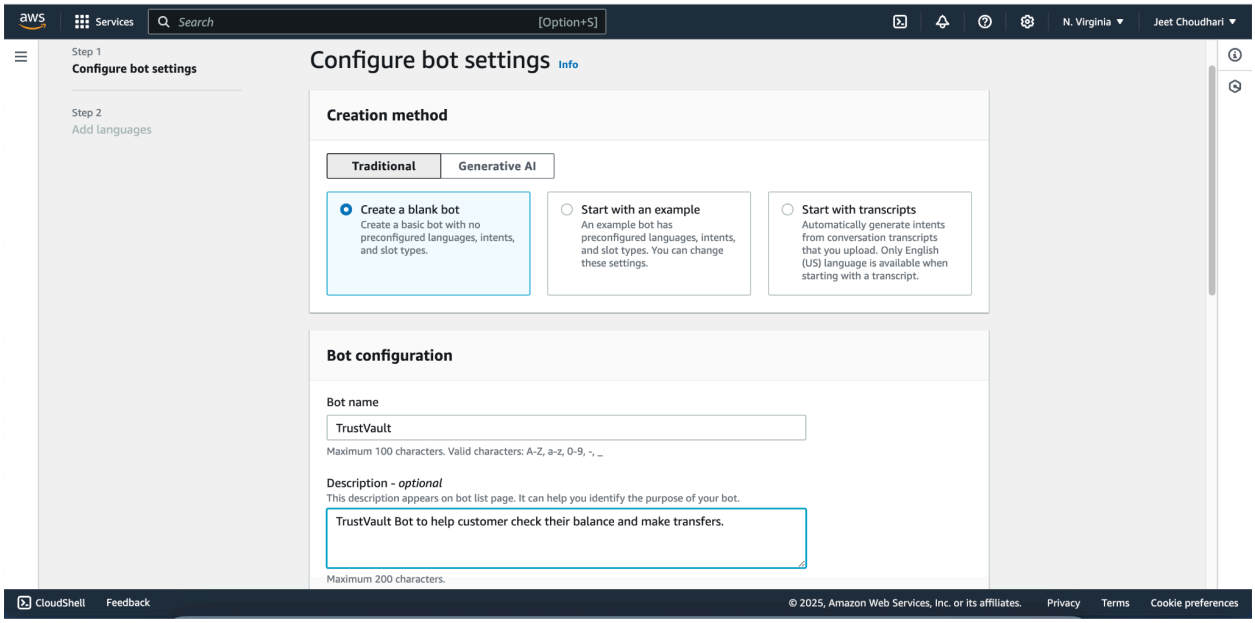
- **Check Account Balances**
- **Transfer Funds**
- **Make Payments**
- **Follow-Up Queries Handling**
- **Seamless Integration with AWS Lambda**

Step-by-Step Guide

1. Set Up the Lex Bot

1. **Log in to AWS**: Navigate to Amazon Lex.
2. **Switch to Lex V2 Console**: Ensure the URL includes `/lexv2/`.
3. **Create a New Bot**:
    - Name: `TrustVault`
    - Description: `Banker Bot to help customers check their balance and make transfers.`
    - Permissions: Create a role with basic Lex permissions.

- Under Children’s Online Privacy Protection Act (COPPA): select No
- Language: English
- Session Timeout: 5 minutes
- Confidence Score Threshold: 0.4



4. Click **Done** to finalize the bot setup.

What is the intent classification confidence score threshold?

When you're using Amazon Lex to build a chatbot, this threshold is like a minimum score for your chatbot to confidently understand what the user is trying to say.

Setting this to 0.4 means that your chatbot needs to be at least 40% confident that it understands what the user is asking to be able to give a response.

So if a user's input is ambiguous and your chatbot's confidence score is below 0.4, it'll throw an error message.

What is Intent?

Intents are what the user is trying to achieve in their conversation with the chatbot. For example, checking a bank account balance; booking a flight; ordering food.

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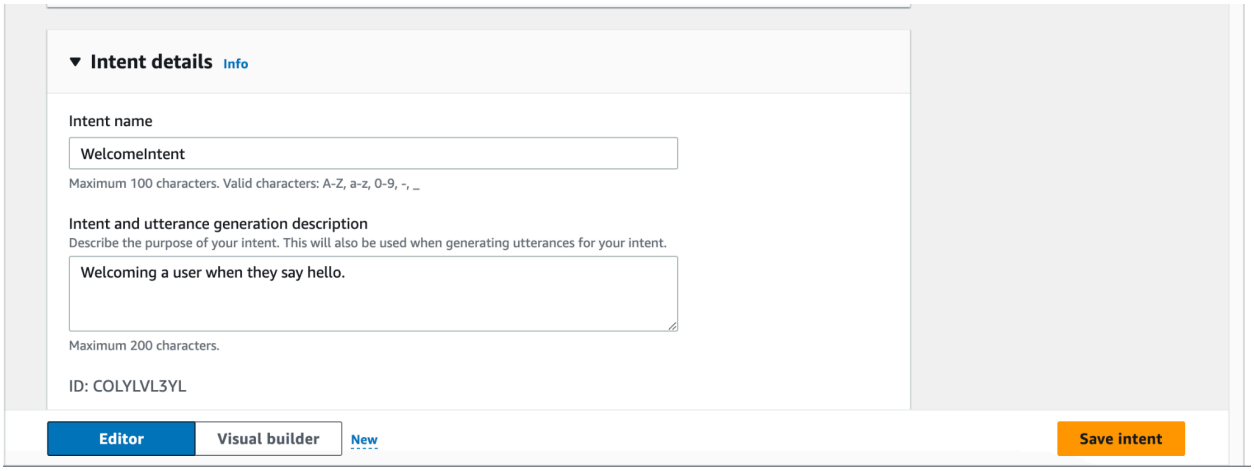
2. Create Intents

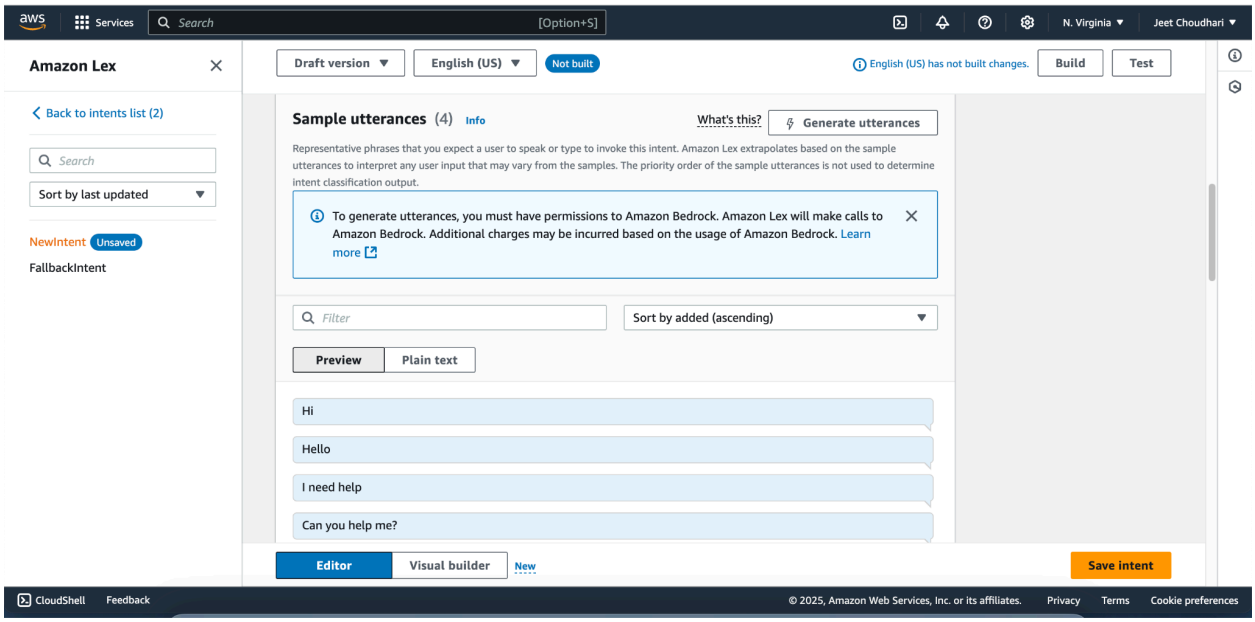
Intents define the actions the chatbot can perform.

Welcome Intent

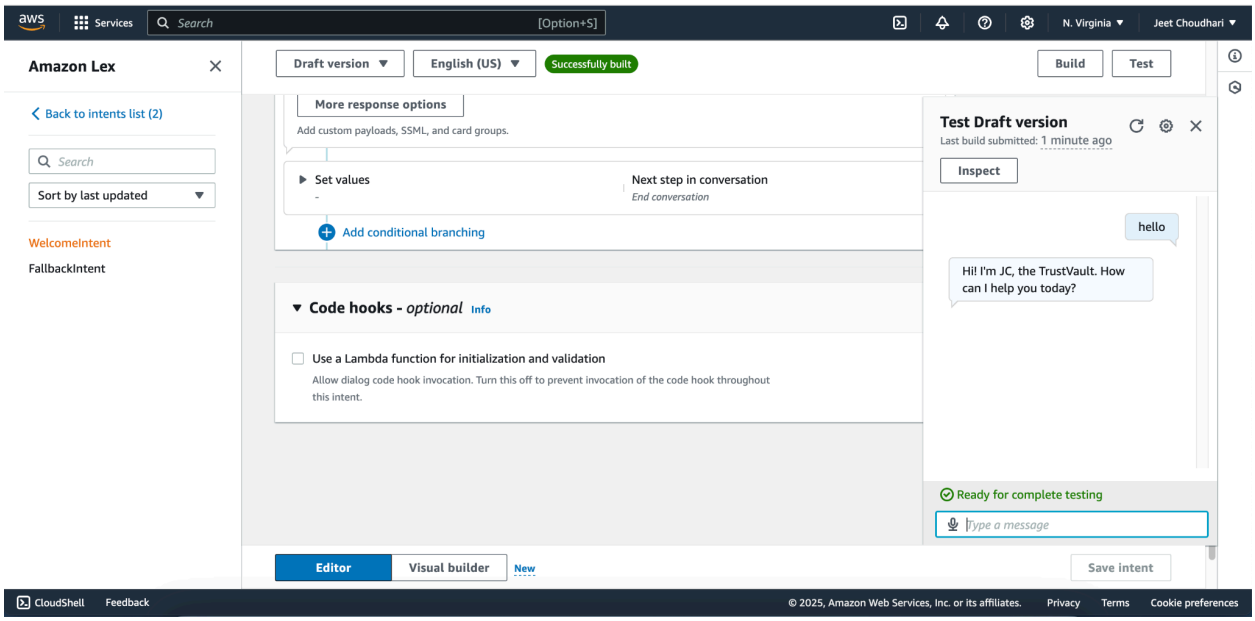
- **Intent Name:** WelcomeIntent
- **Description**: Greet users and provide an introduction.



- Scroll down to the **Sample utterances** panel and click **Plain Text** button
- **Paste the Sample Utterances**:
    - Hi
    - Hello
    - I need help

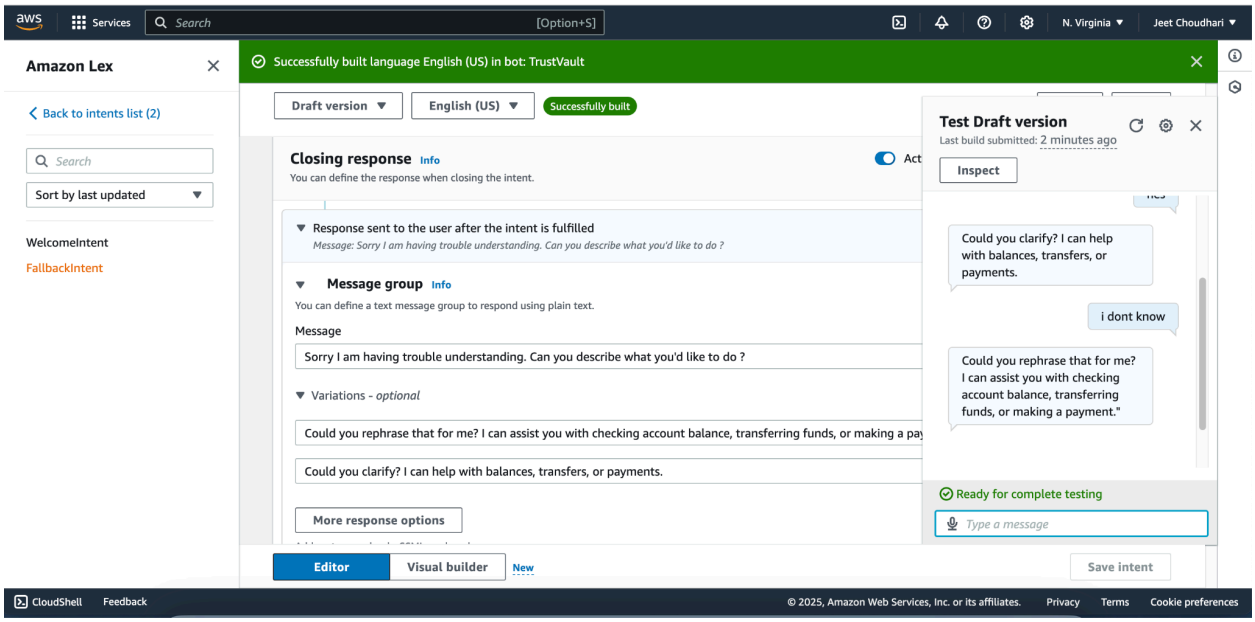


- **Closing Response**: Expand the arrow for **Response sent to the user after the intent is fulfilled**. Customize a friendly reply like, *"Welcome to TrustVault. How can I assist you today?"*



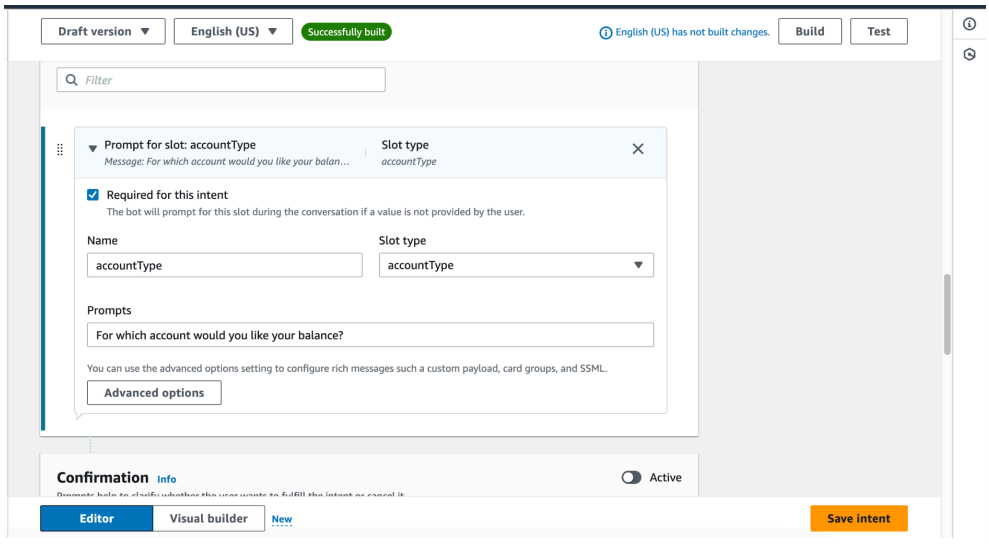
Fallback Intent

- Triggered when the chatbot cannot match a user input to any intent.
- **Message**: *"Sorry, I didn't understand that. I can help you check balances, transfer funds, or make a payment. Can you rephrase?"*



CheckBalance Intent

- **Purpose**: Retrieve a user's bank account balance.
- **Sample Utterances**:
  - "What's the balance in my {accountType} account?"
  - "Check my account balance."
- **Slots**:
  - `accountType` (Custom Slot): Accepts account types like Checking, Savings, Credit.
  - `dateOfBirth` (AMAZON.Date): Asks for user verification.
- **Fulfillment**: Connects to a Lambda function to generate and return a random balance.



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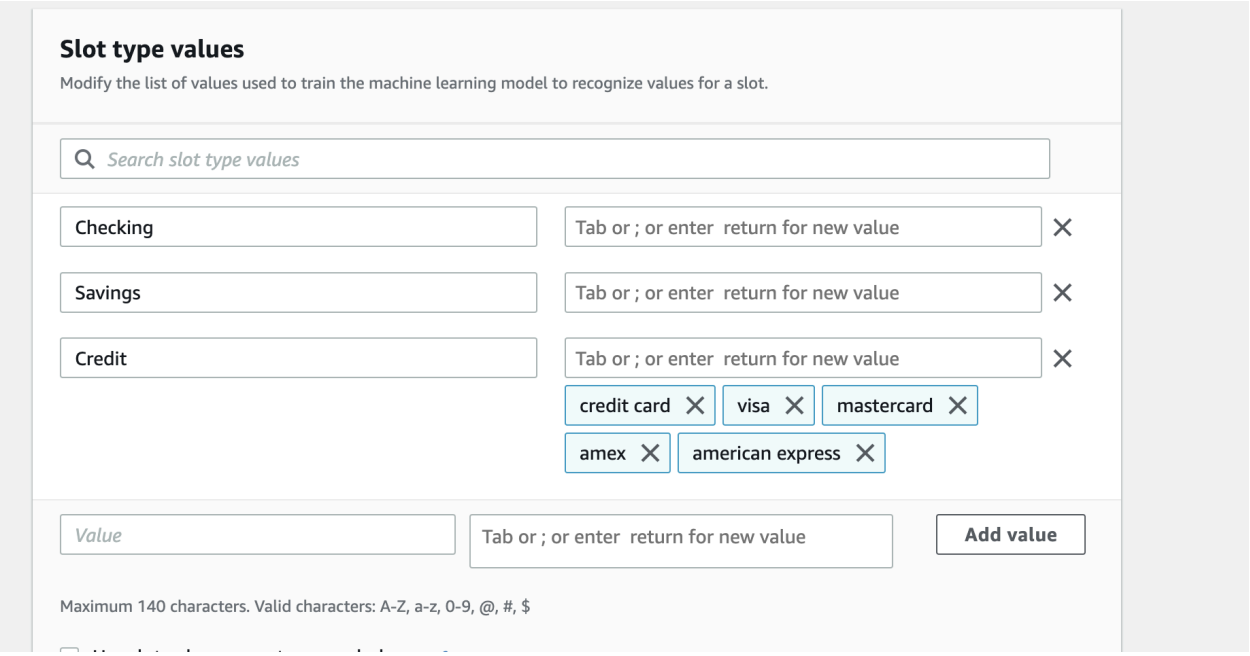
3. Create Custom Slots

Slots capture specific information needed to fulfill an intent.

- **accountType Slot**:
    - Values: Checking, Savings, Credit
    - Synonyms: Credit Card, Visa, Mastercard
- Restrict slot values to maintain consistent responses.



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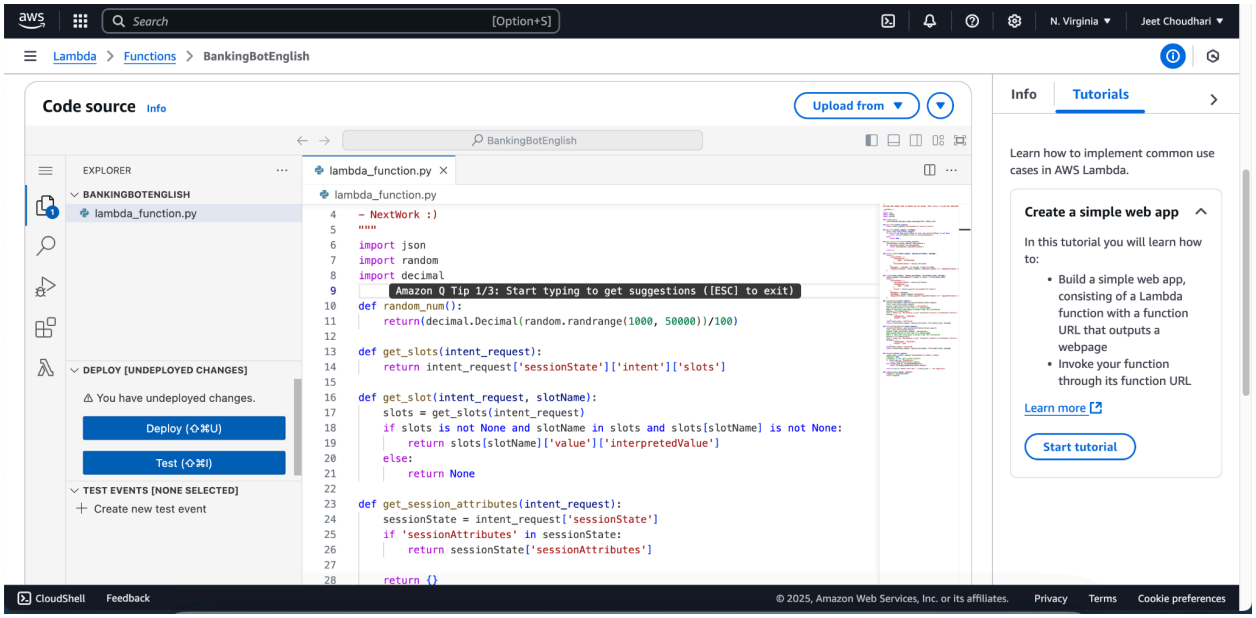
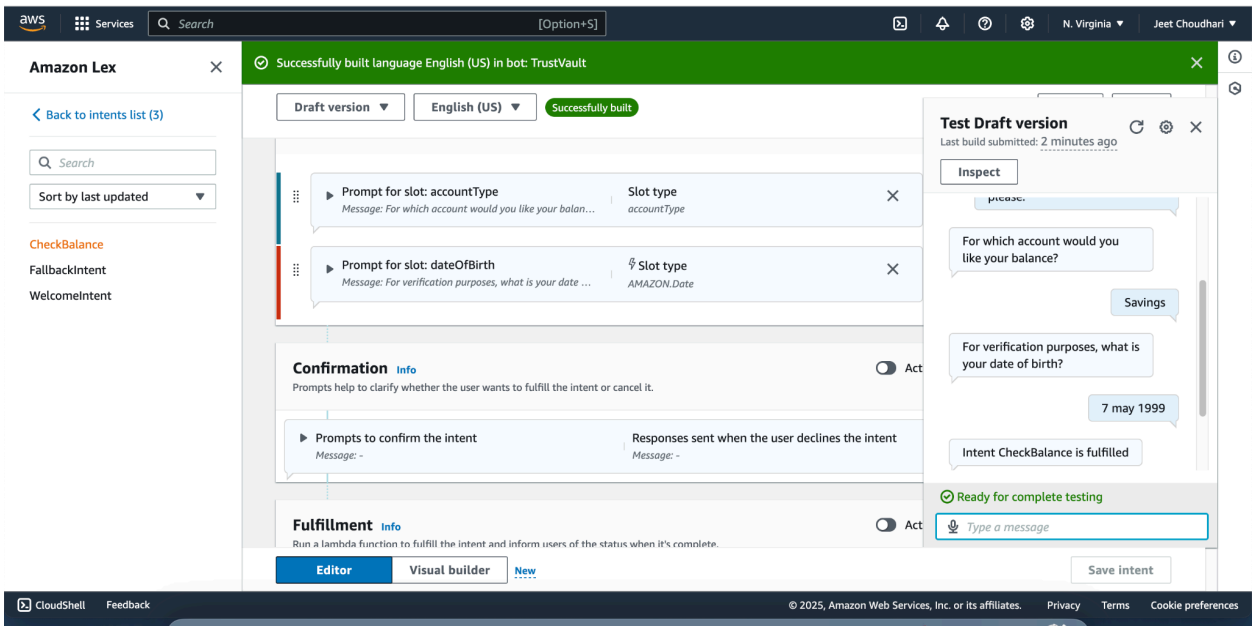
4. Connect Lambda Functions

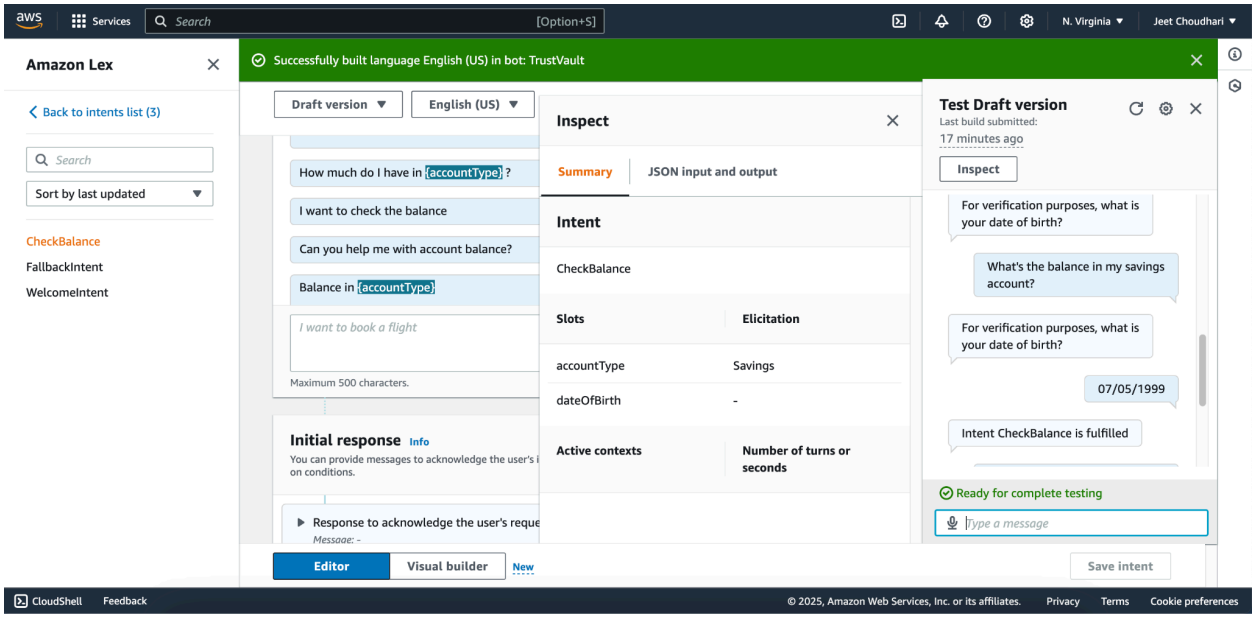
1. Navigate to AWS Lambda and create a new function:
    - Name: `BankingBotEnglish`
    - Runtime: Python 3.12
2. Replace default code with custom logic to:
    - Generate random account balances.
    - Process and respond to chatbot requests.
3. Deploy the function.



Integrating Lambda with Lex

1. In Lex, link the bot's alias to the Lambda function ($LATEST version for updates).
2. Configure the CheckBalance intent's fulfillment to call this Lambda function.





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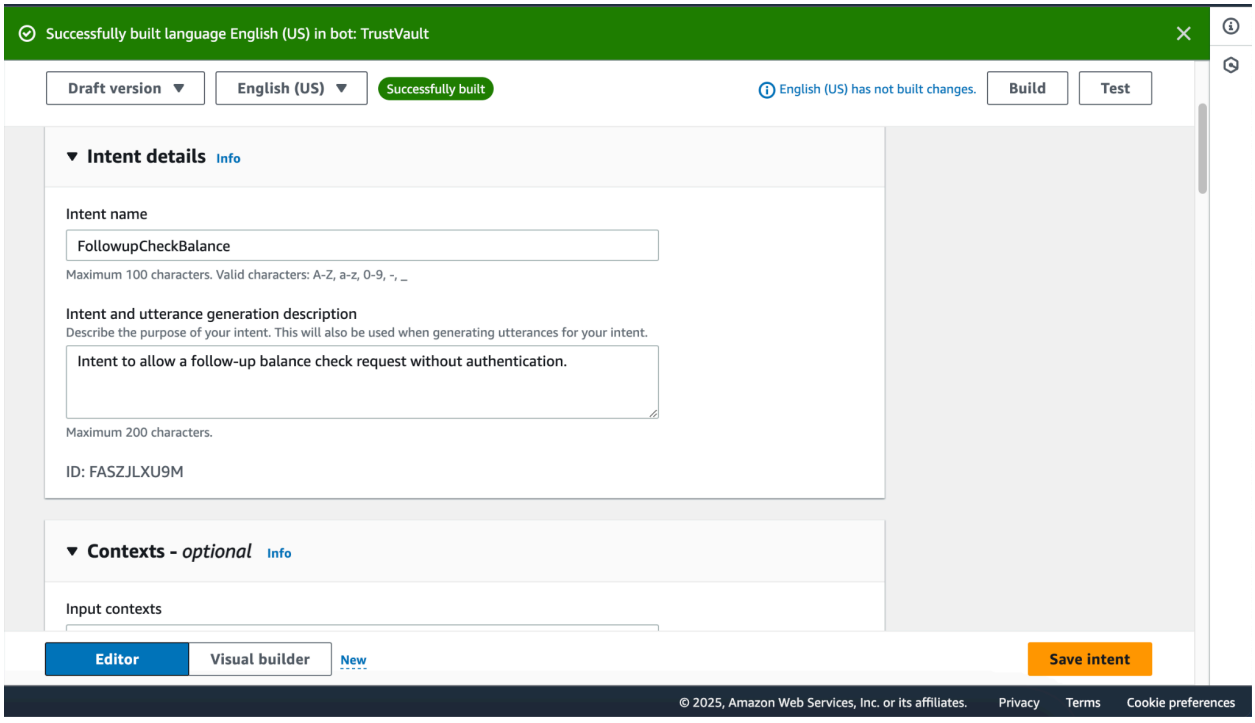
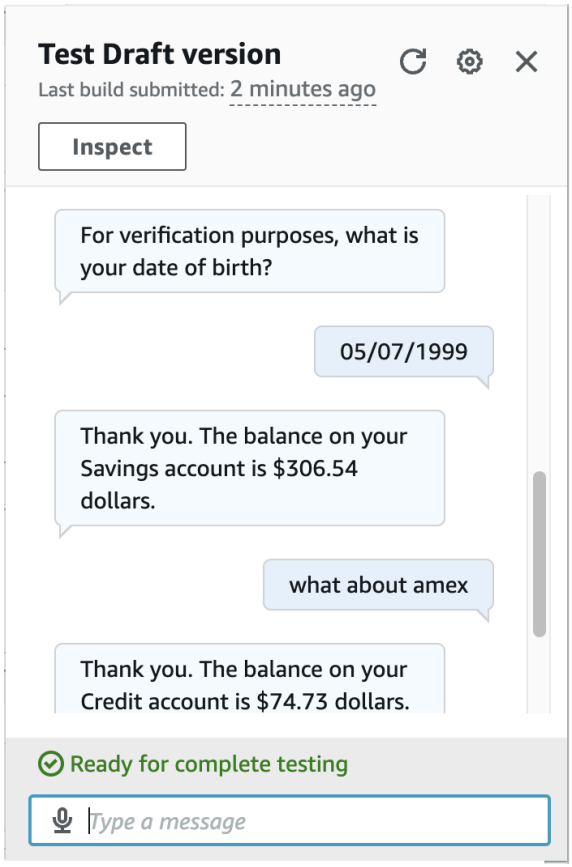
5. Add Follow-Up Intents

- **FollowupCheckBalance Intent**:
  - Handles follow-up questions without re-verifying the user's date of birth.
  - Uses **Context Tags** to persist information like `dateOfBirth` across intents.





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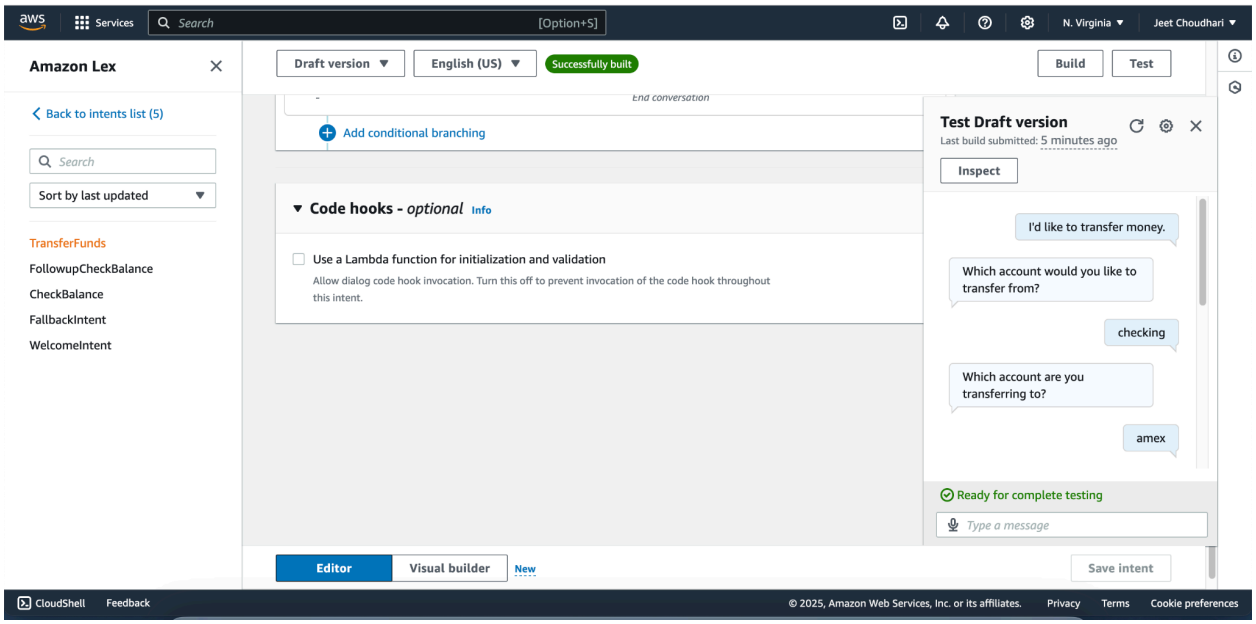
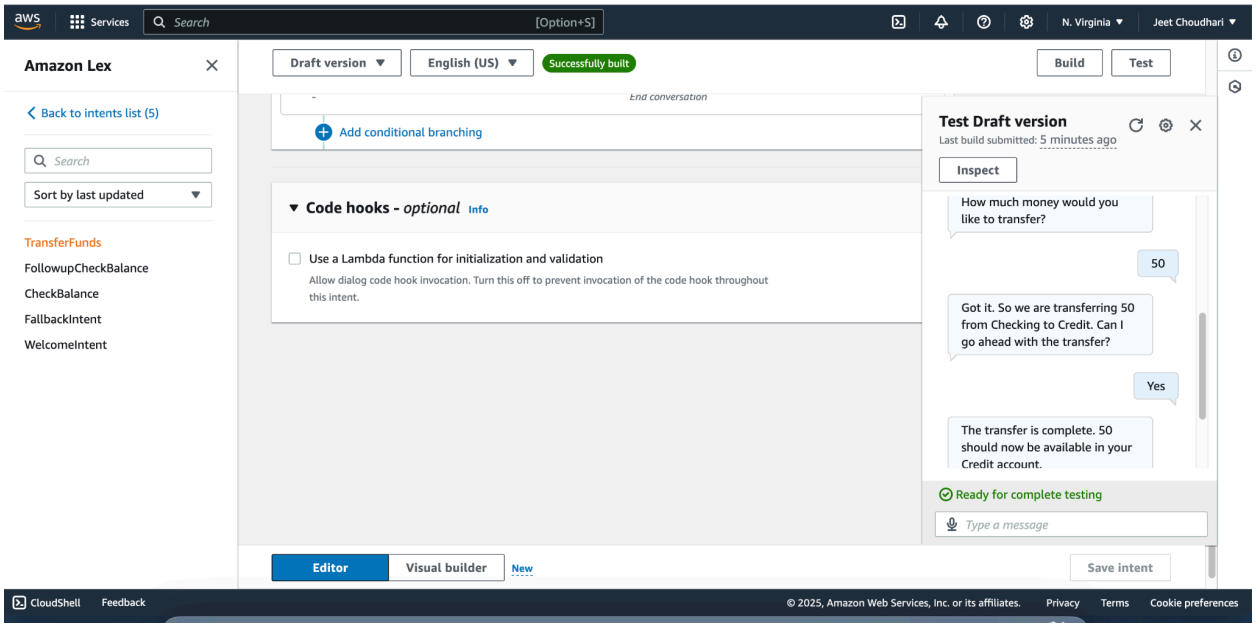
6. TransferFunds Intent

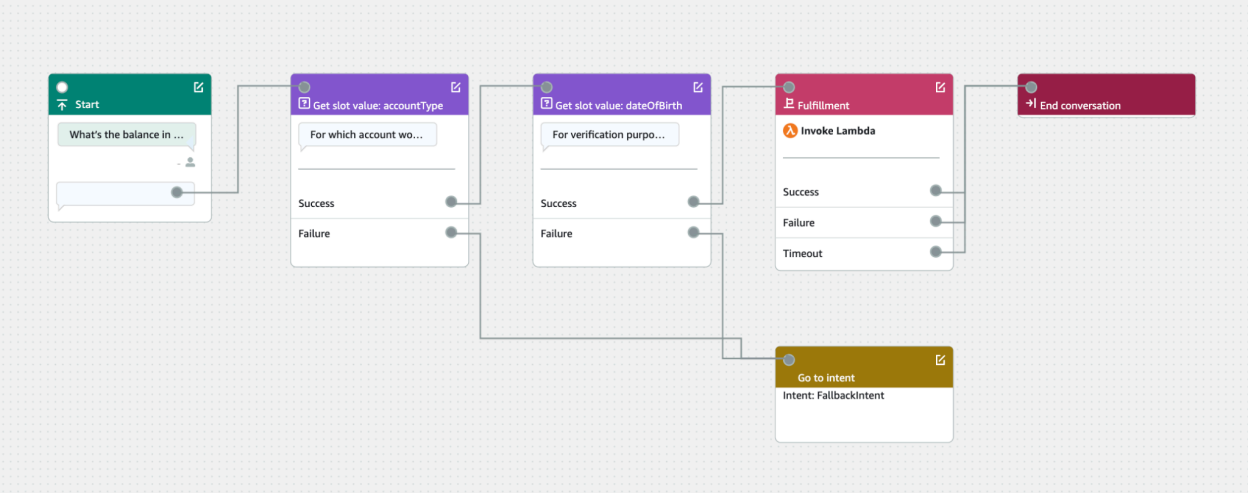
- **Purpose**: Facilitate money transfers between accounts.
- **Slots**:
  - `sourceAccountType`: Account to transfer funds from.
  - `targetAccountType`: Account to transfer funds to.
  - `transferAmount`: Amount to be transferred.
- **Confirmation Prompt**: *"You're transferring {transferAmount} from {sourceAccountType} to {targetAccountType}. Proceed?"*
- **Decline Response**: *"The transfer has been cancelled."*
- **Fulfillment**: Calls Lambda to process the transfer.





Testing and Deployment

- Regularly test the bot using the built-in testing tool in Amazon Lex.
- Ensure each intent and slot behaves as expected.
- Deploy the chatbot and integrate it with client-facing platforms.



This document serves as a complete guide to creating an Amazon Lex chatbot, from setup to advanced features. If further clarification or enhancements are required, let me know!