

Basic Ordering App with Twilio, AWS Lex and Alexa

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- **Natural Language Processing Class**
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Voice User Interface (VUI) Conversation Architecture (simple)

Design Priorities

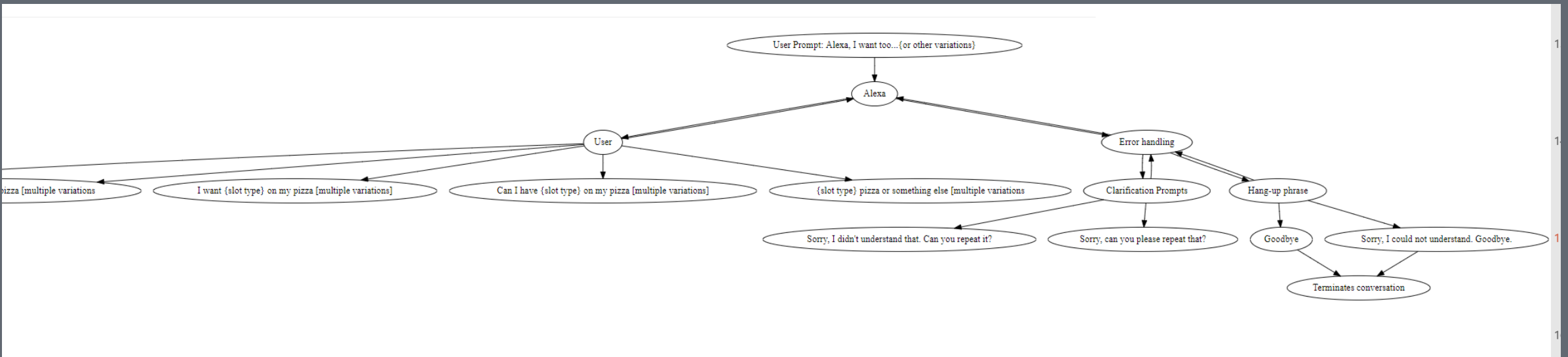
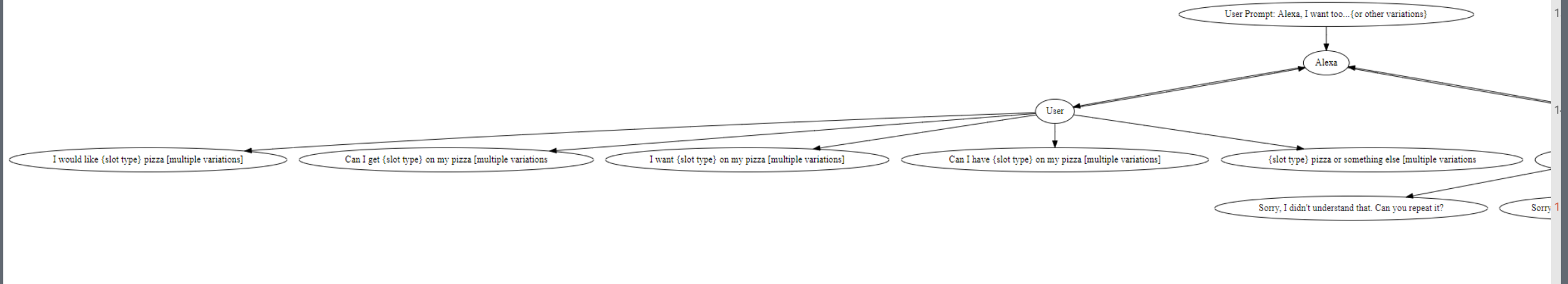
- Choose the device genre
- Phones, wearables, etc.
- Understand technology constraints
- Non-linearity
- Precise or Ambiguous Speech
- Explicit or Implicit Intent
- Directive or Question
- Voice Input
- End to End Process
- Triggers or Leading Cue
- "Hey Google! ..." "Alexa, ..."
- Feedback UX

UX Design Principles

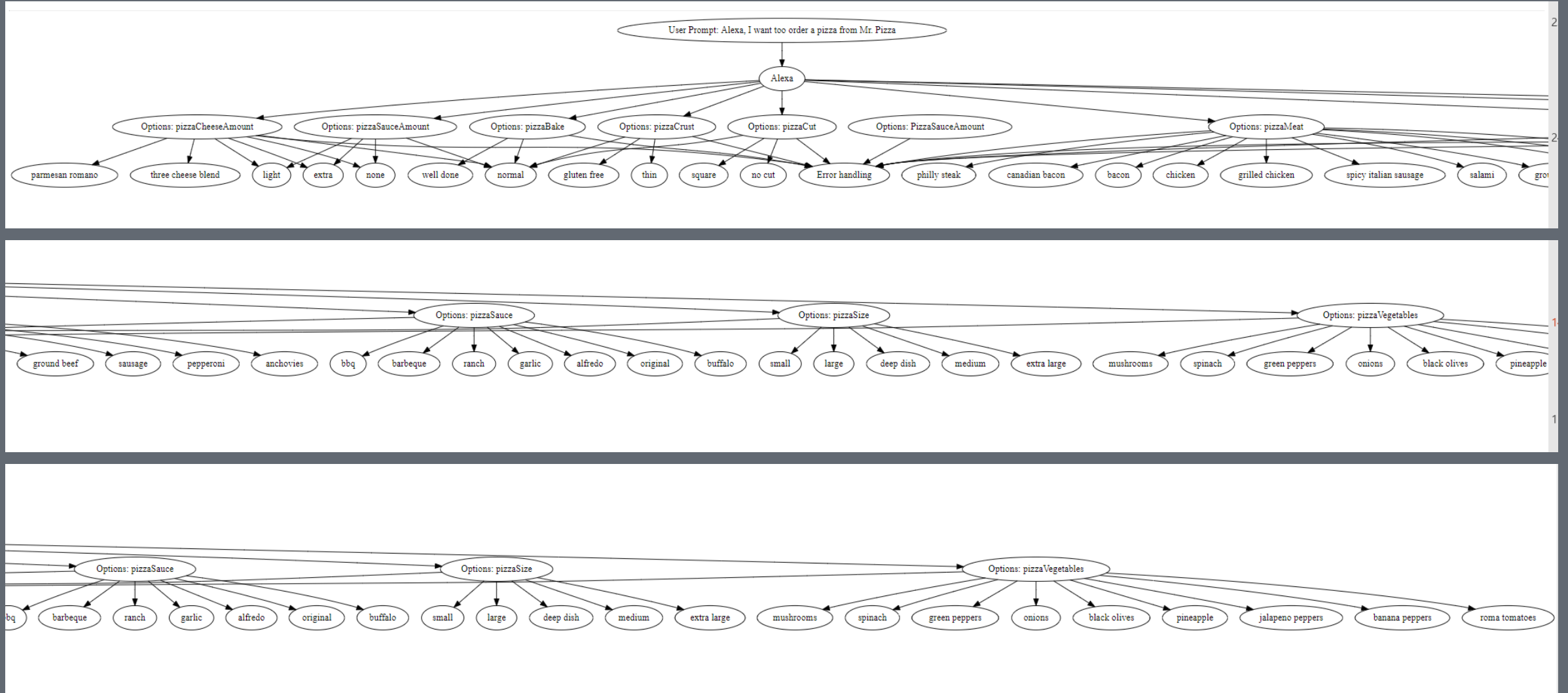
- Real-time, responsive visuals
- Audio playback
- Real-time text
- Output text
- Non-screen visual cues
- Ending Cueing
- Adequate time
- Adaptive time
- Reasonable pause
- Conversational UX
- Affirmative
- Corrective
- Empathetic
- Anthropomorphized UX
- End to End Motion UX

Alexa Conversational Framework

Warning: :5: string ran past end of line



Alexa Conversational Flow - Detailed



User: "Alexa, I want to order a pizza from Mr. Pizza."

Alexa: "Ok, what size pizza do you want to order?"

User: "I want to order a ... pizza."
User: "... " - can say just option words
Options: small, medium, large, extra large or deep dish

Alexa: "Do you want a ... crust pizza?"
Options: thin, normal, gluten-free

User: "I want a ... crust pizza."
User: "... " - can say just the options
User: "... crust pizza."
User alternate: "deep-dish pizza"
Options: thin, normal or deep-dish

Alexa: "What type of cut do you want?"

User: "I want a ... cut."
"I want a ... cut pizza."
"... cut."
"... cut pizza."
Options: normal, square, no cut

Alexa: "How do you want your pizza baked?"

User: "I want it baked ... "
"... "
Options: normal, normally, well done

Alexa: "What type of sauce do you want on your pizza?"

User: "What are my options?"
"What are my choices?"
"What types of sauces are there?"
"I want ... "
"... "
"... sauce."
"I want ... sauce."

Alexa response to first 3 questions: "Your choices are garlic, buffalo, bbq, alfredo, ranch or original. What type of sauce would you like?"

User: "What are my options again?"
"What are my choices again?"
"What types of sauces are there again?"
"I want"
"... ."
"... sauce."
"I want ... sauce."

User: "I want"
"... ."
"... sauce."
"I want ... sauce."
Options: normal, light, extra, none

User: I want... " "I would like ..."
"... " "... cheese."
Options: normal, light, none, extra,
parmesan romano or 3 cheese blend

Alexa response to first 3 questions: "Your
choices are garlic, buffalo, bbq, alfredo,
ranch or original. What type of sauce
would you like?"

User: "What are my options?"
"What are my choices?"
"I want"
"... ."
"... sauce."
"I want ... sauce."

Alexa: "Do you want meat on your pizza?"

User: "I want"
"... ."
"... sauce."
"I want ... sauce."
Options: garlic, buffalo, bbq, alfredo,
ranch or original

Alexa response to first 3 questions: "Your
choices are normal, light, extra or none.
How much sauce would you like?"

User: "..."
Options: yes or no

Alexa: "How much sauce
would you like?"

Alexa: "How much cheese would you
like?"

If yes, Alexa: "What type of meat would
you like on your pizza?"

User: "I want"
"... ."

Options: chicken, grilled chicken,
peperoni, beef, meatball, spicy Italian
sausage, bacon, philly steak, sausage,
anchovies, Canadian bacon, salami

User Alternative: "What are my choices?"

Alexa: "Your choices are, grilled chicken,
peperoni, beef, meatball, spicy Italian
sausage, bacon, philly steak, sausage,
anchovies, Canadian bacon, or salami."

User: "I want"
"... ."

Options: chicken, grilled chicken,
peperoni, beef, meatball, spicy Italian
sausage, bacon, philly steak, sausage,
anchovies, Canadian bacon, salami

If no, Alexa: "Ok, would you like any
veggies on your pizza?"

If yes, User: "I want"
"... . " "I would like"

Options: mushrooms, roma tomatoes,
pineapple, onions black olives, spinach,
jalapeno peppers, banana peppers, green
peppers

Or could go through
options again...

If no, Alexa: "Ok, I am going to place your
order now. Is there anything else I can do
for you?"

If yes, User: "Yes, I would like"
(notional)

If no, User: "No." "No, that is
all."

Alexa: "Your order has been placed. You
will get a call from the delivery driver once
they arrive. Your pizza will be ready in 20
minutes" **I need to ask if this is delivery
or carry out in the beginning.

Terminates Process....

Let's start with you all texting the Mister Pizza ordering app...

**Text "Can I order a pizza?"
I want to order a pizza?"
to +1-240-318-7865**



Ordering is based off Papa John's custom pizza ordering tool on the website

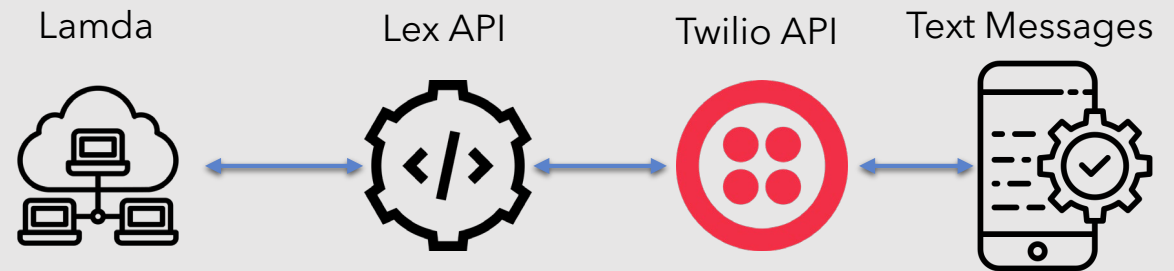


Choices are:

- **Pizza Size** = small, medium, large, extra large or deep dish
- **Crust** = normal, gluten free, or thin
- **Cut** = normal, square, no cut
- **Bake** = normal (normally), or well done
- **Sauce** = barbeque (bbq), alfredo, buffalo, ranch, garlic, or original
- **Cheese** = normal, light, extra, none, parmesan romano, or three cheese blend
- **Meat** = Philly Steak (steak), Canadian Bacon (ham), Bacon, Chicken, Grilled Chicken, Meatball, sausage, spicy Italian sausage, salami, beef, pepperoni, or anchovies
- **Vegetables** = mushrooms, spinach, green peppers, banana peppers, jalapeno peppers, onions, black olives, pineapple, roma tomatoes

Product Integration & Architecture

- Amazon Lex - Service for building conversational interfaces for applications using voice and text
 - Intents - Action i.e. Order a Pizza
 - Slots - Sauce or Crust
 - Slot Types - Small or Large
- Amazon Lambda - Allows you to run code without provisioning or managing servers
- Twilio - Developer platform for communications
 - SID
 - Authentication Token
 - Request URL - from Amazon Lex
 - Chatbot / Interactive / 2-way



Amazon Alexa Class Quiz



Must haves:

AWS Console Account
AWS Developer Account
AWS Blueprints Account (if you choose to leverage blueprints)



Utilized template



Built and deployed in 40 minutes

Quiz Skill Overview

- Users can take a 10 question quiz to test their knowledge or ask Alexa about the points listed above to learn about a state.
- Welcome
- Teach / define
- Quiz
- Error response (no slots matched)
- Help
- What's my score?

Lessons Learned / Challenges

Architecting VUI's are complex

- Think through each part of a conversation (questions, answers & conversation flow)

Leverage reuse where possible

Learn the technology first! → then architect


Learn different architecture models, wireframes, prototyping software and plan for the details (UI/UX)

Future Work

- Explore and integrate the deep learning capabilities of AWS Lex, Alexa and Twilio
- Learn to prototype with Adobe XD Alexa Kit
- More hands-on experience with building Alexa Apps
- Integration with Alexa
- More experimentation with AWS Lambda, Lex, Alexa and Twilio

QUESTIONS?

BACK UP
SLIDES

A thin, vertical white line is positioned to the right of the text, extending from the top of the word 'SLIDES' to the top of the word 'BACK'.

Launch

Open Quiz Game

◦ LaunchRequest

Any time the skill is launched

Welcome

Welcome to the United States Quiz Game!

Play a game?

You can ask me about any of the fifty states and their capitals, or you can ask me to start a quiz. What would you like to do?

Answer Intent

New York

Give Definition

Valid Slot

- An Answer is given but we are NOT in a quiz (states.QUIZ != true)
- The Answer given is a valid slot value
- Slots: State Name, Capital, Year founded, Order added to union, abbreviation

Give definition

New York is the 11th state, admitted to the union in 1788. The capitol of New York is Albany and the abbreviation for New York is NY. I've added New York to your Alexa app.

Learn More?

Which other state or capital would you like to know about?

- "{State name} is the {number} state, admitted to the Union in {year}. The capital of {state} is {capital}, and the abbreviation for {state} is {abbreviation}. I've added {stateName} to your Alexa app."
- "Which other state or capital would you like to know about?"

Answer Intent

Pickles

Give Definition

Not a Valid Slot

- An Answer is given but we are NOT in a quiz (states.QUIZ != true)
- The Answer given is NOT a valid slot value
- Slots: State Name, Capital, Year founded, Order added to union, abbreviation

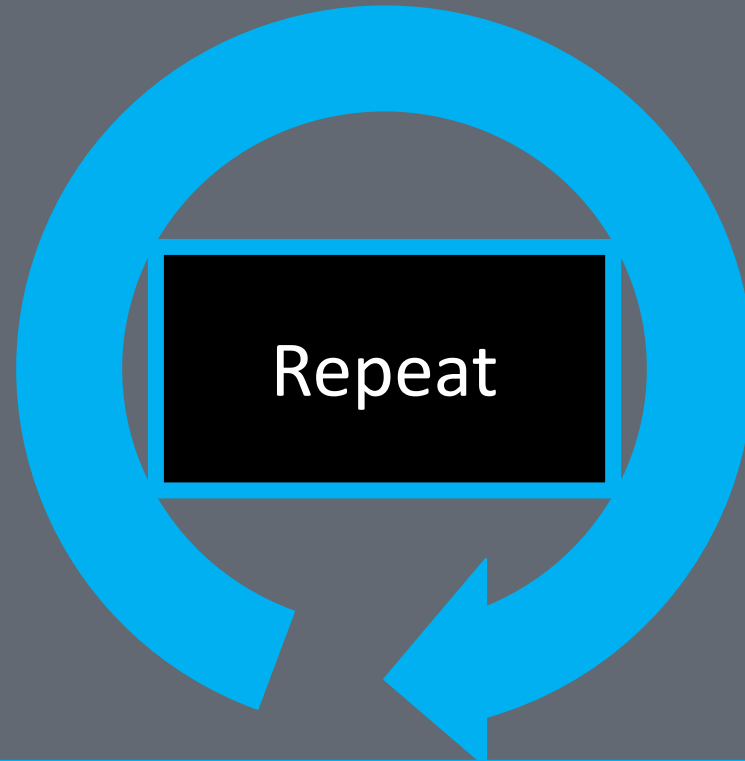
Unknown Answer

I'm sorry, pickles is not something I know very much about in this skill. I know lots of things about the United States.

Play a game?

You can ask me about a state or a capital, and I'll tell you what I know. You can also test your knowledge by asking me to start a quiz. What would you like to do?

- "I'm sorry \${item} is not something I know very much about in this skill. I know lots of things about the United States."
- "You can ask me about a state or a capital, and I'll tell you what I know. You can also test your knowledge by asking me to start a quiz. What **would** you like to do?"



Repeat as many times as the user would like, until they end the session or start a quiz

Quiz Intent

Quiz me

Start a new quiz

- Quiz Intent or a AMAZON.StartOverIntent

Start Quiz

OK. I will ask you 10 questions about the United States.

Question

Here is your 1st question. What is the capitol of New York state?

- Start the quiz (states.QUIZ == true)
- Lead with "Here is your \${counter}th question."
- then randomize between the following question formats
 - What is the {abbreviation} of {State}?
 - What is the {capital} of {State}?
 - When was {State} made a state?
 - What was the order that {State} was added to the union?
- On screens, display without the ordinal.
- Remember the current question and set the number of questions to 10.
- Clear any current score or question count

AnswerIntent

Albany

Quiz in progress

- An Answer is given and we are in a quiz (states.QUIZ == true)
- Slots: State Name, Capital, Year founded, Order added to union, abbreviation

Respond to Answer

Woohoo! New York is the 11th state, admitted to the union in 1788. The capitol of New York is Albany and the abbreviation for New York is NY. Your current score is 1 out of 10.

Question

Here is your 2nd question. What is the abbreviation of Missouri?

Increment question count

WHEN correct

- Increment score
- Add a positive interjection

WHEN incorrect or an invalid answer

- Add a negative interjection

WHEN always

- “[State name] is the {number} state, admitted to the Union in {year}. The capital of {state} is {capital}, and the abbreviation for {state} is {abbreviation}. ”
- “Your current score is x out of y.”

WHEN question count is less than 10

- “Here is your x question.” then ask one of the following randomly,
 - “What is the {abbreviation} of {State}?”
 - “What is the {capital} of {State}?”
 - “When was {State} made a state?”
 - “What was the order that {State} was added to the union?”

WHEN question count is 10 or more

- “Your final score is x out of y”
- Read Exit Message and end the session

AnswerIntent

Spokane

Quiz in progress

- An Answer is given and we are in a quiz (states.QUIZ == true)
- Slots: State Name, Capital, Year founded, Order added to union, abbreviation

Respond to Answer

Womp womp. Missouri is the 24th state, admitted to the union in 1821. The capitol of Missouri is Jefferson City and the abbreviation for Missouri is MO. Your current score is 1 out of 10.

Question

Here is your 3rd question. What is the capitol of Texas?

Increment question count

WHEN correct

- Increment score
- Add a positive interjection

WHEN incorrect or invalid answer

- Add a negative interjection

WHEN always

- "{State name} is the {number} state, admitted to the Union in {year}. The capital of {state} is {capital}, and the abbreviation for {state} is {abbreviation}. "
- "Your current score is x out of y."

WHEN question count is less than 10

- "Here is your x question." then ask one of the following randomly,
 - "What is the {abbreviation} of {State}?"
 - "What is the {capital} of {State}?"
 - "When was {State} made a state?"
 - "What was the order that {State} was added to the union?"

WHEN question count is 10 or more

- "Your final score is x out of y"
- Read Exit Message and end the session

Repeat

What was that?

- AMZON.RepeatHandler
- In a quiz (states.QUIZ == true)

In a quiz

NA

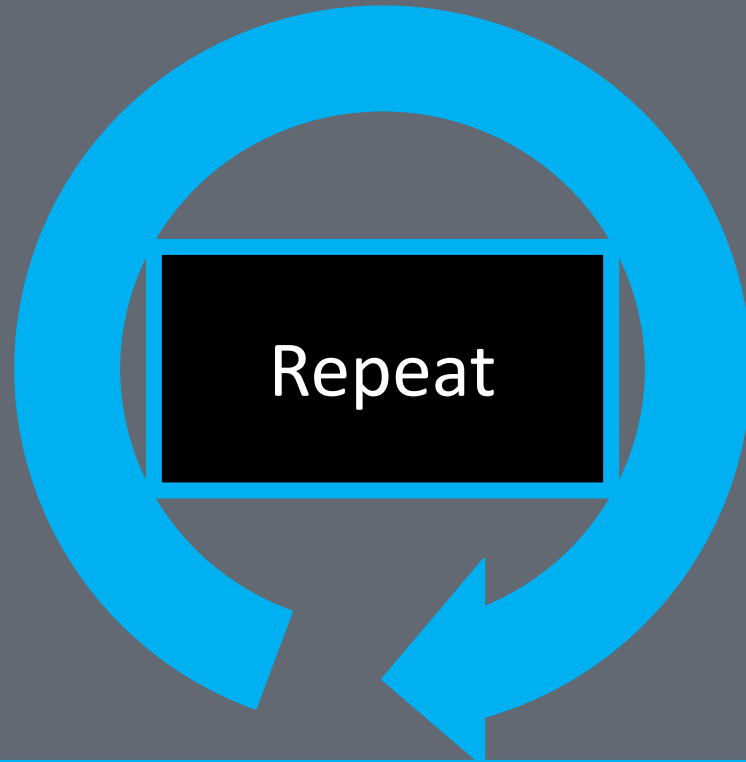
NA

Question

Here is your 3rd question. What is the capitol of Texas?

- “Here is your x question.” then ask one of the following randomly,
 - “What is the {abbreviation} of {State}?”
 - “What is the {capital} of {State}?”
 - “When was {State} made a state?”
 - “What was the order that {State} was added to the union?”

repeat



Repeat until user reaches 10th
question

AnswerIntent

Dallas

Quiz in progress

- An Answer is given and we are in a quiz (states.QUIZ == true)
- Slots: State Name, Capital, Year founded, Order added to union, abbreviation

Respond to Answer

Womp womp. Texas is the 28th state, admitted to the union in 1845. The capitol of Texas is Austin and the abbreviation for Texas is TX. Your current score is 8 out of 10.

Exit Message

Thank you for playing the United States Quiz Game! Let's play again soon.

- Increment question count
- WHEN correct
 - Increment score
 - Add a positive interjection
- WHEN incorrect or invalid answer
 - Add a negative interjection
- WHEN always
 - "{State name} is the {number} state, admitted to the Union in {year}. The capital of {state} is {capital}, and the abbreviation for {state} is {abbreviation}."
 - "Your current score is x out of y."
- WHEN question count is less than 10
 - "Here is your x question." then ask one of the following randomly,
 - "What is the {abbreviation} of {State}?"
 - "What is the {capital} of {State}?"
 - "When was {State} made a state?"
 - "What was the order that {State} was added to the union?"
- WHEN question count is 10 or more
 - "Your final score is x out of y"
 - Read Exit Message and end the session

Help

Help

- AMAZON.HelpIntent or Error

NA

NA

NA

Help Message

`I know lots of things about the United States. You can ask me about a state or a capital, and I'll tell you what I know. You can also test your knowledge by asking me to start a quiz. What would you like to do?`

- `I know lots of things about the United States. You can ask me about a state or a capital, and I'll tell you what I know. You can also test your knowledge by asking me to start a quiz. What would you like to do?`

Exit

I'm done

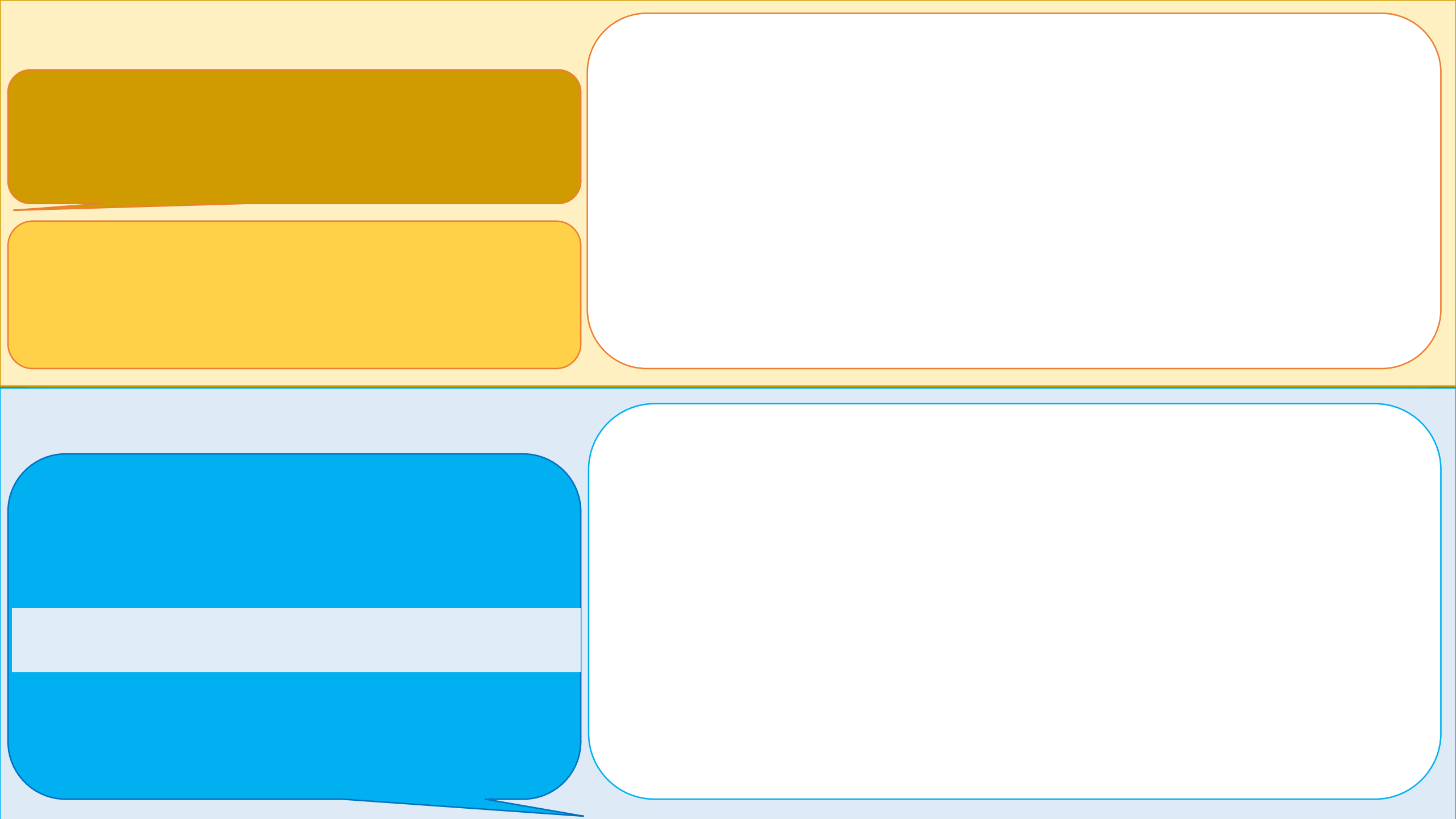
- AMAZON.StopIntent
- AMAZON.PauseIntent
- AMAZON.CancelIntent

NA

Exit Message

Thank you for playing the United States Quiz Game! Let's play again soon!

- End session
- "Thank you for playing the United States Quiz Game! Let's play again soon!"





INSPIRATION HUT - 0.25CM GRID

