

CHATBOT FOR STUDENTS

by

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Declaration

We hereby declare that the project report entitled “Chatbot for Students” submitted by our group members (mentioned below), for “Cloud Computing, CSE2026” is a record of bonafide work carried out by us under the supervision of “Prof. M. Revathi”. We further declare that the work reported in this report has not been submitted and will not be submitted, either in part or in full, for the award of marks in any other schools or for any other subjects at VIT.

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Abstract:

This student helper chat bot project is an Artificial Intelligence based web application designed to guide the students in case of any queries they had. It has a user-friendly interface which helps the user to communicate with our bot and clear their queries. Communication can be done by chatting or by means of speaking. The ability of a bot to understand human language as we have used AWS which has N L P (Natural Language Processing). This chatbot can provide information Time Table, Faculty, HOD, Library, Course List, etc. It can be used for getting information on the clubs available, to advertise club posters. It filters any Offensive image in the club posters and deliver only good content to the students.

This deviation from traditional search capabilities through a website can reduce the search time and can make accessing information easier. It also provides an engaging user interaction and imitate real life conversations for the users. Also, such functionalities implemented via cloud are economical and easy to update. College Life is one of the most remarkable and lovable times of an individual's life. Like school life, college life also plays a vital role in nurturing one. As we had CORONA pandemic during our start of college life, we had only less experience at college. So, we just had no idea of what a college is or what all will be done there. We knew this environment had suffered a lot without knowing many of the valid things that has to be known by every student entering the college.

Also, we had a lot of questions in our mind which had not been answered. Due to the difficulties, we faced, we decided these should not be a hinderance to our future juniors so, we wanted to build a chatbot for college students in order to clear all the confusions in their mind. The chatbot is built by leveraging on Amazon Web Services (AWS) in the form of a service called Amazon Lex for configuring the bot with utterances and responses and Lambda Functions to validate the responses while carrying out the operations by using college website. The lambda function runs a script that collects input in the form of plain text or by using voice recognition using the microphone connected to it, which is sent to the Amazon Lex to be processed using various services provided by Amazon Web Services. Then the chatbot sends back a suitable response to the user through the speaker connected to the device or in the form of plain text. This bot is also integrated with VTOP or official website page of college for collecting details as requested by the user. The admin of the page has access to entire messages that are received through the chatbot and can do the appropriate arrangements as required.

Thus, the admin can manually chat with the students in case of any technical difficulties. It also acts as a bridge for both students and the seniors. It saves time.

Introduction:

Artificial intelligence chat-bot is a technology that makes interactions between man and machines using natural language possible. From literature, we found out that in general, chat-bot are functions like a typical search engine. This project mainly focuses on enabling chat-bot to become a search engine that can process the next search with the relation to the previous search output. In chat-bot context, this functionality will enhance the capability of chat-bot's input processing.

Cloud Based Information Chatbot Project- Cloud based student information Chatbot system is artificial algorithm that analyzes the student queries and reply as messages. In this system artificial intelligence is built to answer the query of the student. Answer are appropriate to the users queries if the user is invalid then it will notify the admin and same in answer, if answer is invalid then it will notify the admin. . Chatbot system retrieves the answer from the database which is stored in the cloud. The Chatbot system uses specific "keyword to retrieve the answer from the database. There is no format to follow while asking any question in the chatbot.

The student can put up any query related to college activities through the system. The system replies to the user with graphical user interface which implies that the real person is talking to the student. The system helps the student not only together their queries answered but also to be updated with the college activities. The Student chatbot project is using artificial algorithms that analyzes users queries and understand users message. The system is a web application which provides answer to the query of the student. Student just have to query through the bot which is used for chatting. Student can chat using any format there is no specific format the user has to follow. The system use artificial intelligence to answer the query.

User can query any college related activities through the chatbot system. The user do not go to college personally for any enquiry. The System analyzes the question then answers to the user. The System answer to the query as if it is answered by the person. The chatbot system replies using an effective graphical user interface which implies that the real person is talking to the user. User can query related to the college activities through online with the help of this web application. chatbot system helps the student to be updated the college activities.

A chat-bot works in a couple of ways: set guidelines and Machine Learning. A chat-bot that functions with a set of guidelines in place is limited in its conversation. It can only respond to a set number of requests and vocabulary and is only as intelligent as its programming code.

An example of a limited bot is an automated banking bot that asks the caller some questions to understand what the caller wants to be done. The bot would make a command like “Please tell me what I can do for you by saying account balances, account transfer, or bill payment.” If the customer responds with "credit card balance," the bot would not understand the request and would proceed to either repeat the command or transfer the caller to a human assistant.

AI-powered chatbots are motivated by the need of traditional websites to provide a chat facility where a bot is required to be able to chat with user and solve queries. When live agent can handle only two to three operations at a time, chatbots can operate without an upper limit which really scales up the operations. Also, if any school or business is receiving lots of queries, having a chatbot on a website takes off the load from support team. Having a chatbot clearly improves the response rate compared to human support team.

In addition, since millennials prefer live chats over a phone call, they find a chatbot, which provide a highly interactive marketing platform, very attractive. Furthermore, a chatbot can automate the repetitive tasks. There can be some scenarios where a business or school receives same queries in a day for many times and support team must respond to each query repetitively. Lastly, the most important advantage of having a chatbot is that it is available 24/7. No matter what time it is, a user can get a query solved. All these advantages of a chatbot constitute the motivation to implement a College Enquiry Chatbot

Many companies provide proprietary and open source platforms to develop chatbots. Amazon Lex, part of Amazon Web Services, is one such service for building conversational interfaces into any application using voice and text. Amazon Lex is a flexible chatbot framework with Natural Language Understanding and Machine Learning capabilities. With Amazon Lex, one can build everything from simple bots for messaging to complex bots for enterprise environments. It utilizes the same backend technologies and services of Alexa, so it can be used to build a conversational bot that listens to users when spoken to, speaks back to them, and converts their words to text via automatic speech recognition (ASR).

Literature survey / Related works:

Building Chatbot Using Amazon Lex and Integrating with A Chat Application - A S S K Sreeharsha (GITAM University) and Sai Mohan Kesapragada (GITAM University)

The study aims at building a voice chatbot device that can be used for hotel reservation using Amazon Lex Service with Facebook Messenger as the communication platform. The chatbot is built by leveraging on Amazon Web Services (AWS) in the form of a service called Amazon Lex for configuring the bot with utterances and responses and Lambda Functions to validate the responses while carrying out the operations by using Facebook Messenger service. The lambda function runs a script that collects input in the form of plain text or by using voice recognition using the microphone connected to it, which is sent to the Amazon Lex to be processed using various services provided by Amazon Web Services. This bot is also integrated with a Facebook page and can be implemented in the real-world applications as well. The admin of the page has access to entire messages that are received through the chatbot and can do the appropriate arrangements as required

Keywords: AWS (Amazon Web Services), Amazon Lex

Cloud Based Student Information Chatbot - Radhika Patel, Nancy Bhagora, Pushpraj Singh, Ms Kavita Namdev

Students who want information about colleges can utilize this chatbot project's website for college queries. Php, CSS, and HTML platforms are utilized to create the chatbot. Students can text the college administrator using the Student Information Chatbot, and the administrator will respond to the message. Students can submit questions at any time using these web-based systems. The chatbot for student can initiate cordial conversations, respond to questions about courses and professors, provide a link to the academic calendar, provide answers to frequently asked questions, calculate fees based on the input of the student, and provide timing, contact, address, and events information for departments like the Union and library. Whether sentiment analysis and active learning are correctly done or not is how this project's success is determined. All searches, including positive, negative, and neutral ones, as well as chats, are stored in the database for this system.

Keywords: Chatbot, AI(Artificial Intelligence), database, PHP, MySql, Sql.

Chat Bot Using AWS - Gowtham S, Harish R, Ilaya Bharathi M, Biji Rose

An artificial intelligence-based online application was created as part of the E-Booking with Chat Bot project to help the automobile rental industry facilitate car rentals. It includes an easy-to-use interface that enables users to speak with our bot and rent them for a set amount of time. Chatting and speaking are both forms of communication. NLP was used to demonstrate how a bot can comprehend spoken human language (Natural Language Processing). While chatting with our bot, you will be given the rental car classifications. The user will be able to make reservations based on the kind of car the customer needs. The bot shall also check for the availability of the car and rent the car to the customer. The bot will question the user for some crucial information, such the date and time of the trip, the type of vehicle, etc. It can also save data on how many reservations were made in the previous six months, the current month, or the previous year. This enables them to monitor business operations and revenue at any time of the month or year. They can decide how to develop their firm based on this knowledge. The customer will be able to choose an automobile based on his budget, which is the biggest benefit. The study goes one step further in enhancing vehicle sharing's sustainability as an environmentally benign mode of transportation, hence promoting sustainability in our society.

Keywords: NLP(Natural Language Processing), AI (Artificial Intelligence), Chatbot

Design of College Chatbot using Amazon Web Services - Dhanush Pakanati, Gourav Thanner and R. Ravinder Reddy

Chatbots have been incorporated in a variety of banking and e-commerce platforms over the years. There is an increasing demand for chatbots due to the rapid growth of mobile and web-based apps. A chatbot's goal is to start a real-world discussion. Its architecture combines a computational algorithm and language model to simulate information exchange between a human and a machine using natural language. It facilitates simple website navigation, makes information searching easier, and aids in comprehending client wants. Following the lead of these examples, a chatbot for a college website can provide visitors, instructors, and students a variety of features. The chatbot can offer information such as announcements, quick links to other site topics, and account-related details for users who have registered. This is mostly used by students and instructors to access their college portals and check a variety of information, including attendance, exam results, assignment deadlines and timetables, etc. This departure from standard website search features can speed up information access and cut down on search

time. Additionally, it offers customers a fun user experience and mimics actual discussions for them.

Keywords – Chatbots, Search Time, User Interaction.

Implementing a College Enquiry Chatbot - Ujaliben Kalpesh Bavishi et.al, 2019

The project uses Microsoft Azure to create a chatbot to be used by college students to get their queries responded easily from the college website. QnA setup is used for friendly conversation between the students and chatbot. This uses LUIS, Language Understanding Intelligent Services which aims at creating cloud-based machine learning language understanding (LU) models.

Keywords: LU – Language Understanding, Microsoft Azure

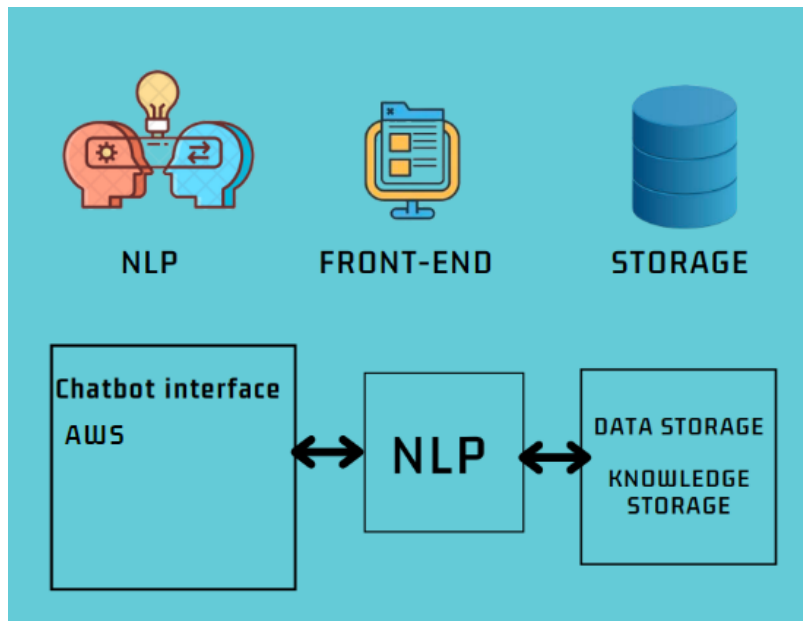
Existing work / system:

A chatbot is an automated program that connects with clients in a human-like manner and is either free or inexpensive to use. Customers can access chat-bot customer service at any point of day or week; they are not restricted by time or place. Due to this, many organizations that might not have the workforce or financial means to maintain employees working around the clock are attracted to its implementation. The existing chatbot for college students has the following features: (i) Students who want information about colleges can utilize this chatbot for college queries, (ii) The ability to strike up cordial discussions, (iii) Providing the link to the academic calendar and responding to FAQs, (iv) Calculating the fees depending on the input of the student and providing the timing, contact information, and address.

Proposed work / system:

The developed chatbot system will have the following features: (i) Club event ads can be advertised. Using deep learning, the image/ poster used for club event advertisement can be sent for classification i.e., approval for displaying the image and (ii) If one's linked-in profile is good then they can approach for advertising. Thus, it helps to propagate their knowledge and also lend their helping hand to others who need it.

System design / Architecture of proposed work:



Technology Stack:

AWS – Amazon Lex, Amazon DynamoDB and Amazon Lambda

Image Classification using Deep Learning

- Software Used: Jupyter
- Language Used: Python

Working modules:

AWS – Amazon Web Service

- Amazon Lex
- Amazon DynamoDB
- Amazon Lambda

Image Classification using Deep Learning

Description of each module:

AWS

- **Amazon Lex** is an AWS service for building conversational interfaces for applications using voice and text. Amazon Lex enables us to build sophisticated, natural language chatbots into your new and existing applications.
- **Amazon DynamoDB** is a fully managed, serverless, key-value NoSQL database, where one can create tables and store the content.
- **Amazon Lambda** is a serverless computing service that runs your code in response to events and automatically manages the underlying compute resources for you. In AWS Lambda, we write code to fetch the data from dynamo DB and then connected it to the AWS Lex to display the fetched data.

Image Classification By Deep Learning Using Python

(i)Installing the required packages

- Tensorflow – loading the deep learning algorithm
- Opencv-python – image loading
- Numpy – pre-processing the image
- Pillow – image resizing, rotation and transformation
- Matplotlib – visualizing/ displaying the image

(ii>Loading an image for image classification

(iii>Loading the deep learning model

- MobileNet - a Deep Learning algorithm used for image recognition and classification
- It is pre-trained and present in tensorflow keras library
- Include and deploy it
- Version one is used

(iv)Pre-processing of the loaded image

- Convert the image to an Array
- Deep learning Algorithm requires four dimensions for prediction
- Adding another dimension

(v)Predicting the possible outcomes

(vi)Displaying the image using matlab plot commands

Screen shots of output:

AWS Lex – Intent and slot types

The screenshot shows the AWS Lex console for the 'VIT_chatbot' in the 'ap-northeast-1' region. The 'Editor' tab is active, showing the configuration for the 'Greetings' intent. The left sidebar lists various intents and slot types. The main configuration area includes sample utterances, Lambda initialization and validation, slots, confirmation prompt, and fulfillment options.

Intents

- closing
- club_date
- club_info
- club_name
- Greetings**
- hod
- lib
- ncc
- pc
- pe
- uc
- ue

Slot types

- No slots created
- Error Handling

Greetings Latest

Sample utterances

- e.g. I would like to book a flight.
- Hey
- hello
- Hello
- Hi
- hi

Lambda initialization and validation

Slots

Priority	Required	Name	Slot type	Version	Prompt
		e.g. Location	e.g. AMAZON.US...		e.g. What city?
1.	<input checked="" type="checkbox"/>	username	AMAZON.FirstNa...	Built-in	what is ur name?

Confirmation prompt

Fulfillment

- ☐ AWS Lambda function
- ☒ Return parameters to client

ap-northeast-1.console.aws.amazon.com/lex/home?region=ap-northeast-1#bot-editor:bot=VIT_chatbot

aws Services Search for services, features, blogs, docs, and more [Option+S]

< VIT_chatbot Latest ▾

Editor Settings Channels Monitoring

Intents +

Search by intent name

closing

club_date

club_info

club_name

Greetings

hod

lib

ncc

pc

pe

uc

ue

Slot types +

No slots created

Error Handling

club_date Latest ▾

Sample utterances ⓘ

e.g. I would like to book a flight. +

imp events of the club? ✕

date of events? ✕

Lambda initialization and validation ⓘ

Slots ⓘ

Priority	Required	Name	Slot type	Version	Prompt
		e.g. Location	e.g. AMAZON.US...		e.g. What city?
1.	<input checked="" type="checkbox"/>	clubdate	AMAZON.AlphaN...	Built-in ▾	imp event date?

Confirmation prompt ⓘ

Fulfillment ⓘ

☒ AWS Lambda function ☐ Return parameters to client

Lambda function chatbot_vit ▾

[View in Lambda console](#)

Version or alias Latest ▾

Amazon Lex x +

ap-northeast-1.console.aws.amazon.com/lex/home?region=ap-northeast-1#bot-editor:bot=VIT_chatbot

aws Services Search for services, features, blogs, docs, and more [Option+S]

< VIT_chatbot Latest ▾

Editor Settings Channels Monitoring

Intents +

Search by intent name

closing

club_date

club_info ✕

club_name

Greetings

hod

lib

ncc

pc

pe

uc

ue

Slot types +

No slots created

Error Handling

club_info Latest ▾

Sample utterances ⓘ

e.g. I would like to book a flight. +

clubs in vit? ✕

what are the top clubs in vit? ✕

club info? ✕

Lambda initialization and validation ⓘ

Slots ⓘ

Priority	Required	Name	Slot type	Version	Prompt
		e.g. Location	e.g. AMAZON.US...		e.g. What city?
1.	<input checked="" type="checkbox"/>	club	AMAZON.AlphaN...	Built-in ▾	what are the clubs in vit?

Confirmation prompt ⓘ

Fulfillment ⓘ

☒ AWS Lambda function ☐ Return parameters to client

Lambda function chatbot_vit ▾

[View in Lambda console](#)

Version or alias Latest ▾

Amazon Lex

ap-northeast-1.console.aws.amazon.com/lex/home?region=ap-northeast-1#bot-editor:bot=VIT_chatbot

Services Search for services, features, blogs, docs, and more [Option+S]

< VIT_chatbot Latest

Editor Settings Channels Monitoring

Intents

Search by intent name

closing

club_date

club_info

club_name

Greetings

hod

lib

ncc

pc

pe

uc

ue

Slot types

No slots created

Error Handling

pc Latest

Sample utterances

e.g. I would like to book a flight.

Programme core courses?

List of pc courses?

Lambda initialization and validation

Slots

Priority	Required	Name	Slot type	Version	Prompt
		e.g. Location	e.g. AMAZON.US...		e.g. What city?
1.	<input checked="" type="checkbox"/>	pc_info	AMAZON.AlphaN...	Built-in	Do you want to know about pro...

Confirmation prompt

Fulfillment

☒ AWS Lambda function ☐ Return parameters to client

Lambda function vit_course

View in Lambda console

Version or alias Latest

ap-northeast-1.console.aws.amazon.com/lex/home?region=ap-northeast-1#bot-editor:bot=VIT_chatbot

Services Search for services, features, blogs, docs, and more [Option+S]

< VIT_chatbot Latest

Editor Settings Channels Monitoring

Intents

Search by intent name

closing

club_date

club_info

club_name

Greetings

hod

lib

ncc

pc

pe

uc

ue

Slot types

No slots created

Error Handling

closing Latest

Sample utterances

e.g. I would like to book a flight.

thank you

tnx

Bye

bye

Thank you

Lambda initialization and validation

Slots

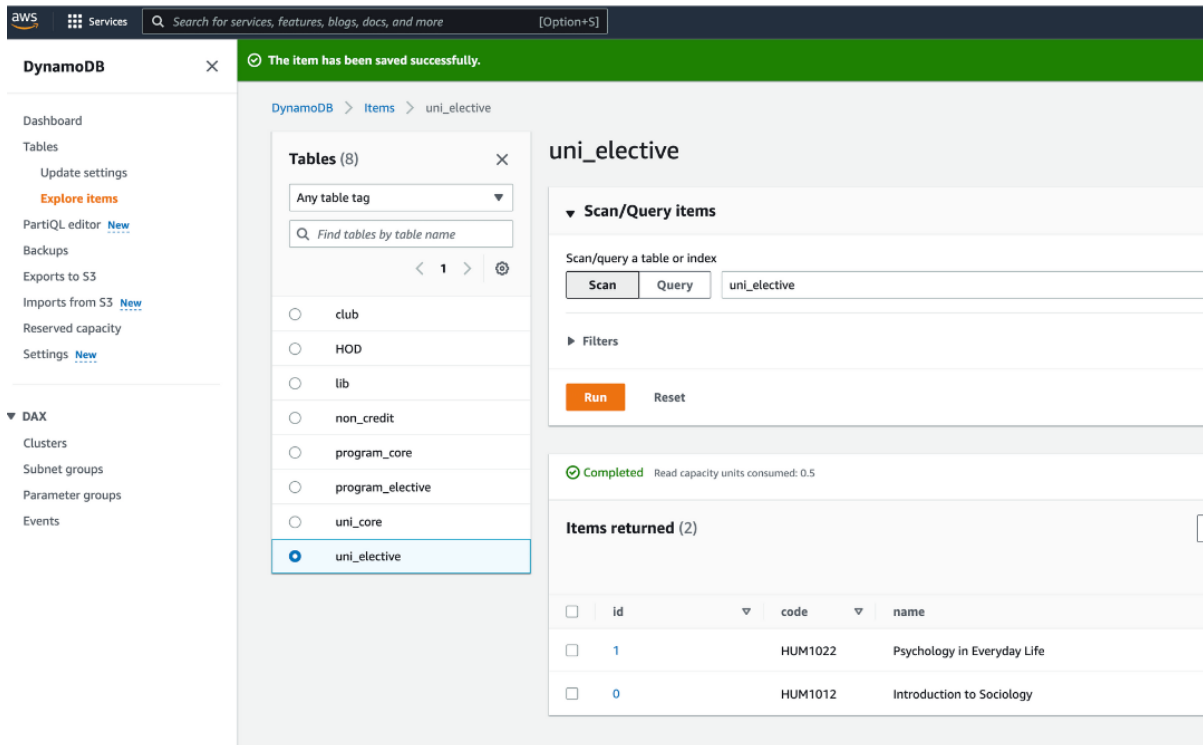
Priority	Required	Name	Slot type	Version	Prompt
		e.g. Location	e.g. AMAZON.US...		e.g. What city?
1.	<input checked="" type="checkbox"/>	close	AMAZON.AlphaN...	Built-in	Thank you for using this chatbot.

Confirmation prompt

Fulfillment

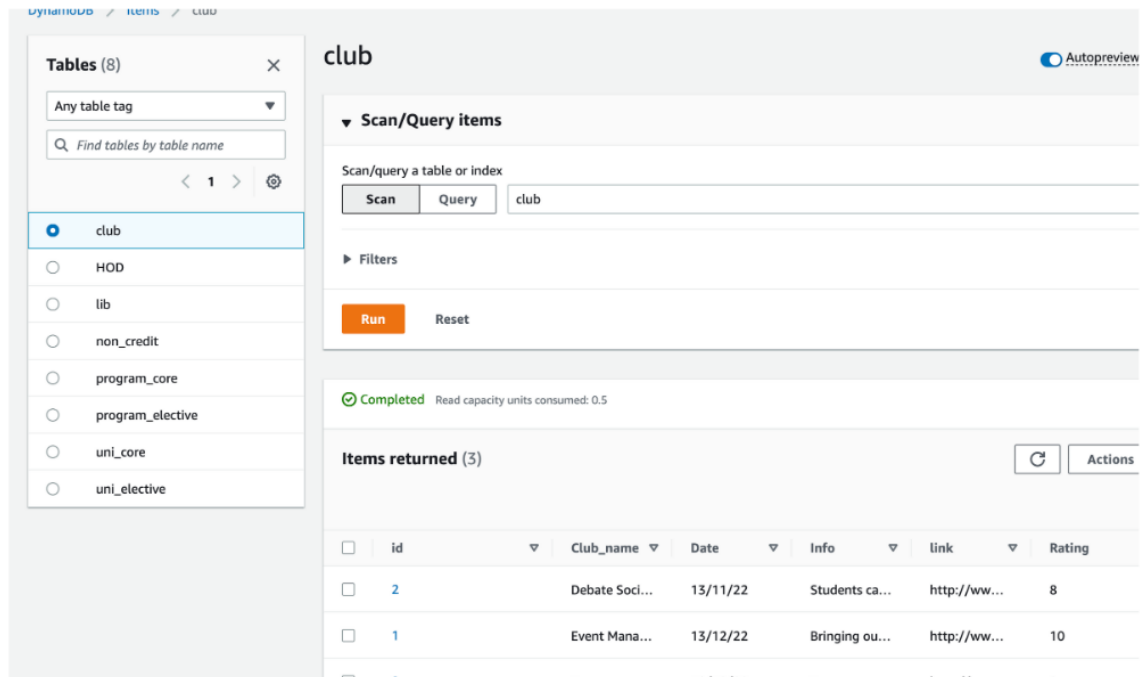
☐ AWS Lambda function ☒ Return parameters to client

AWS Lambda:



The screenshot shows the AWS Management Console interface for the DynamoDB service. A green notification bar at the top states "The item has been saved successfully." The left sidebar contains navigation links for Dashboard, Tables, Update settings, Explore items, PartiQL editor, Backups, Exports to S3, Imports from S3, Reserved capacity, and Settings. The main content area displays the "uni_elective" table. The "Tables (8)" list on the left includes club, HOD, lib, non_credit, program_core, program_elective, uni_core, and uni_elective. The "Scan/Query items" section shows a successful scan of the "uni_elective" table, returning 2 items. The "Items returned (2)" table is as follows:

	id	code	name
<input type="checkbox"/>	1	HUM1022	Psychology in Everyday Life
<input type="checkbox"/>	0	HUM1012	Introduction to Sociology



The screenshot shows the AWS Management Console interface for the DynamoDB service. The left sidebar contains navigation links for Dashboard, Tables, Update settings, Explore items, PartiQL editor, Backups, Exports to S3, Imports from S3, Reserved capacity, and Settings. The main content area displays the "club" table. The "Tables (8)" list on the left includes club, HOD, lib, non_credit, program_core, program_elective, uni_core, and uni_elective. The "Scan/Query items" section shows a successful scan of the "club" table, returning 3 items. The "Items returned (3)" table is as follows:

	id	Club_name	Date	Info	link	Rating
<input type="checkbox"/>	2	Debate Soci...	13/11/22	Students ca...	http://ww...	8
<input type="checkbox"/>	1	Event Mana...	13/12/22	Bringing ou...	http://ww...	10
<input type="checkbox"/>	0	Enactus	13/12/22	To engage t...	http://ww...	8

Tables (8)

Any table tag

Find tables by table name

< 1 >

⚙️

☐ club

☒ HOD

☐ lib

☐ non_credit

☐ program_core

☐ program_elective

☐ uni_core

☐ uni_elective

HOD

▼ Scan/Query items

Scan/query a table or index

Scan

Query

HOD

► Filters

Run

Reset

✔️ Completed

Read capacity units consumed: 0.5

Items returned (2)

<input type="checkbox"/>	id	Dept	Name	Ph
<input type="checkbox"/>	1	AI and ML	C.Sweetlin ...	9876543210
<input type="checkbox"/>	0	CPS	G.Maheswari	9876543210

Chatbot:

> Test bot (Latest)

✔️ Ready. Build complete.

Hi

what is ur name?

Gayathri

Hi ! Gayathri, I am xxx chatbot, an assistant of VIT.You can ask your queries.

List of pc courses?

Do you want to know about programme core courses in CPS?

> Test bot (Latest)

✓ Ready. Build complete.

Do you want to know about programme core courses in CPS?

yes

The course Distributed Real-Time Systems, and its course code is CSE2021. The course Data Structures and Algorithms, and its course code is CSE2011. The course Computer Architecture and Organization, and its course code is CSE2001.

h

[Clear chat history](#)

> Test bot (Latest)

✓ Ready. Build complete.

h

Sorry, can you please repeat that?

List of pe courses?

Do you want to know about programme elective courses in CPS?

s

The course Smart Infrastructure, and its course code is CSE3079. The course

> Test bot (Latest)

✓ Ready. Build complete.

my timetable?

Everybody have a unique timetable. Check your Vtop.

ok

Any queries?

> **Test bot (Latest)** ✔ Ready. Build complete.

Do you want to know about programme elective courses in CPS?


s

The course Smart Infrastructure, and its course code is CSE3079. The course Signals and Systems, and its course code is CSE2030. The course Computer Controlled Systems, and its course code is CSE3074.

bye

Thank you for using this chatbot.

[Clear chat history](#)

 Chat with your bot...

Inspect response

Dialog State: ElicitSlot [Hide](#)

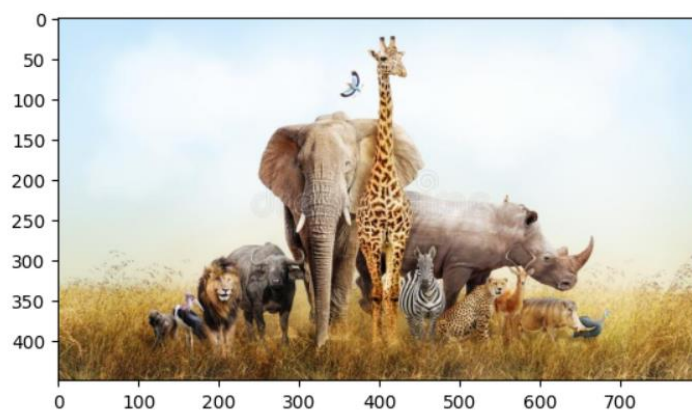
☒ Summary ☐ Detail

Intent: closing

Slots (0/1)

close	null
-------	------

Image Classification by Deep Learning



```
from tensorflow.keras.applications import imagenet_utils
predictions = mobile.predict(final_image)
results = imagenet_utils.decode_predictions(predictions)
print(results)
```

```
1/1 [=====] - 0s 42ms/step
[[('n02417914', 'ibex', 0.46593356), ('n02504013', 'Indian_elephant', 0.16212514), ('n02403003', 'ox', 0.07027564), ('n02397096', 'warthog', 0.06578425), ('n02437312', 'Arabian_camel', 0.04078312)]]
```

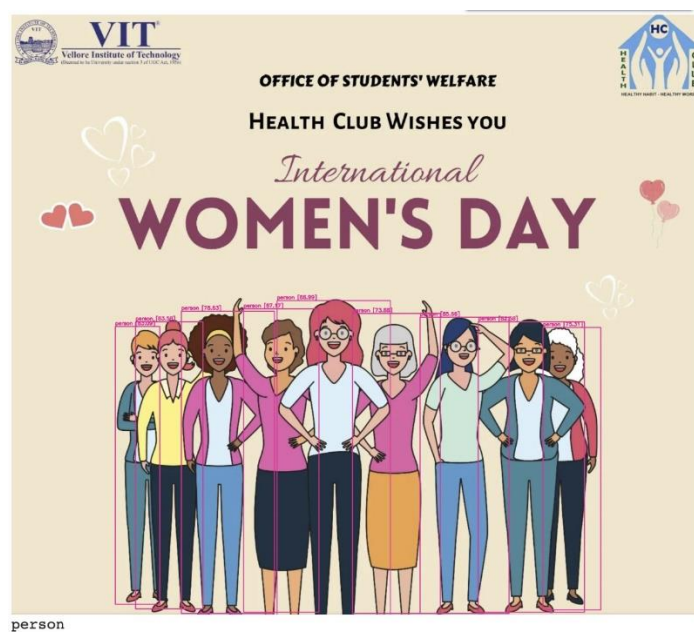
Object Detection



knife
Weapon detected

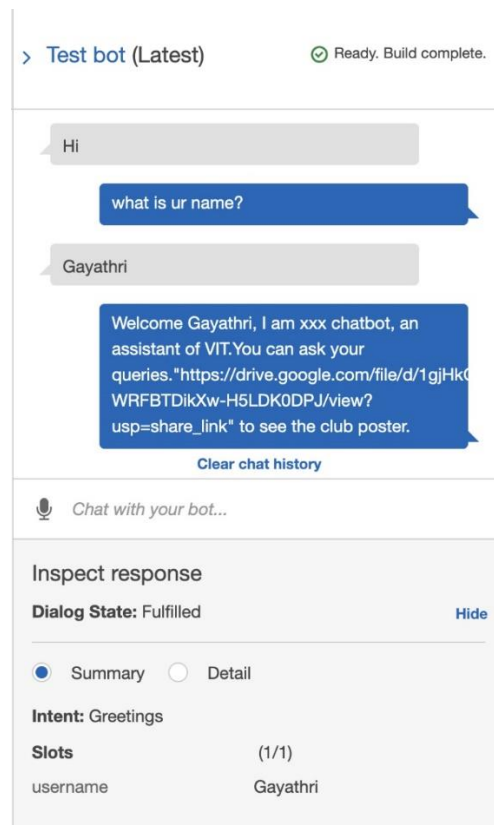


knife
Weapon detected



person

Chatbot with poster link



Conclusion:

"Chatbot for students" is a chatbot designed for VIT students. This chatbot is helpful in guiding all department students with correct and most up-to-date sources of information. Students can get the information at their fingertips rather than visiting the college office. It improves efficiency by taking over tasks for which humans are not essential. Also, this chatbot provides a link for the students regarding the advertisement of the clubs in VIT. Using Amazon's services, we developed a chatbot and used AI and deep learning to classify images as offensive or not, and those offensive images were not shown to students. The most important thing is that any student can send their advertisement.

Future work:

To improve the current functionalities of this chatbot, in the future, the scope of the chatbot can be increased by inserting data for all the departments, training the bot with varied data, testing it on the live website, and based on that feedback inserting more training data to the bot.

Some of the new features which can be added to the bot are 1) integration with multiple channels such as phone calls, SMS, and various social media platforms like Skype, Facebook, and Twitter, 2) handling context-aware and interactive queries in which the bot will be aware of the context of an ongoing conversation with a student, 3) integration with services such as password reset and course, 4) collect information from students and fill out the form or any complaint.

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