Build your own chatbot using Python

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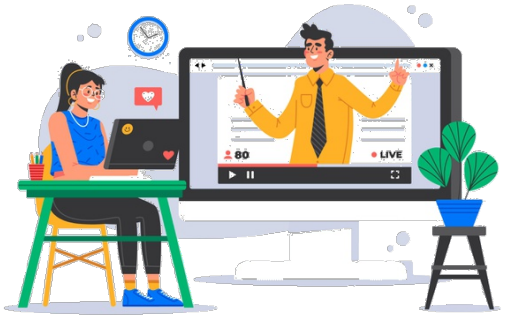
Great Learning

Session Takeaways

Build your own chatbot using Python

- **Introduction** to chatbots
- **Types** of chatbots
- Top **applications** of chatbots
- **Architecture** of chatbots
- **How** does a chatbot work?
- **Practical demonstration** in Python



Did you know?

Python is the world's most popular programming language!

- Popular **streaming** services make use of Python extensively.
- The name Python is derived from a **TV show.**
- Very popular for **Natural Language Processing (NLP)**

Introduction to Chatbots

Introduction to Chatbots 

What are chatbots?

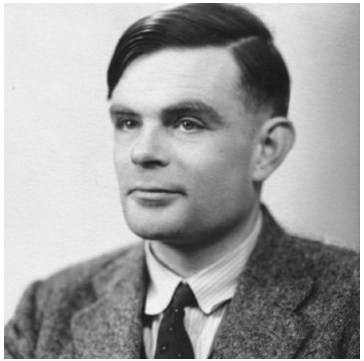
- Chatbots are simulations which can understand human language, process it and interact back with humans while performing specific tasks.
- The first chatbot was created by Joseph Wiesenbaum in 1966, named **Eliza**.

Introduction to Chatbots

History of chatbots

“ Can machines think like humans? ”

- Alan Turing



Introduction to Chatbots

History of chatbots

Eliza – 1966

Parry – 1972

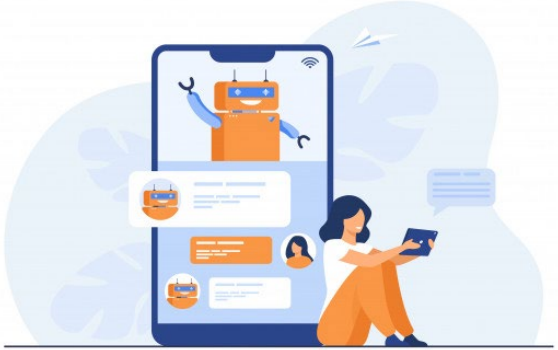
A.L.I.C.E – 1995

Smarter Child – 2001

SIRI – 2010

Google Now – 2012

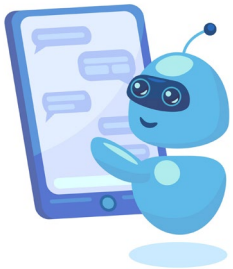
Alexa - 2015



Types of Chatbots

Types of Chatbots

Important types:



Text-based chatbots

Voice-based chatbots

Types of Chatbots

Chatbots are designed using these approaches:

- **Rule-based Chatbot:** Bot answers questions based on some rules on which it is trained on. The rules defined can be very simple to very complex.

- **Self-learning Chatbot:** Bot that learns how to communicate using the result of a machine learning model to learn and assess current situation.

Top applications of chatbots

Top applications of chatbots

Hundreds of applications today

Helpdesk assistant

Email distributor

Home assistant

Top applications of chatbots

Hundreds of applications today

Operations assistant

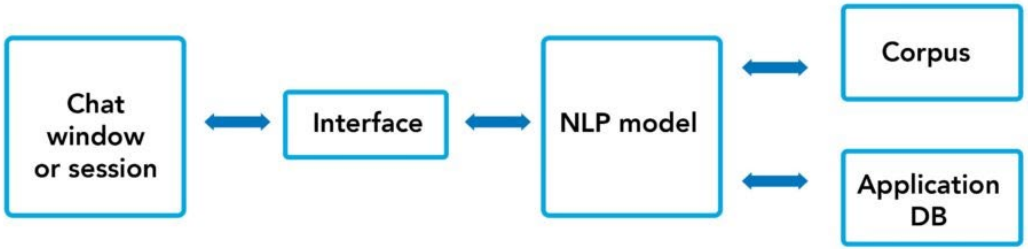
Phone assistant

Entertainment assistant

Architecture of chatbots

Architecture of chatbots

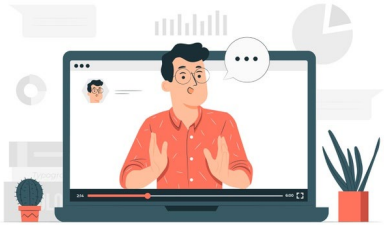
A typical chatbot architecture should consist of:



How does a chatbot work?

How does a chatbot work?

Very important steps:



1. Import corpus
2. Preprocess the data
3. Text case handling
4. Tokenization
5. Stemming
6. Bag of Words (BOW)
7. One hot encoding

How does a chatbot work?

Corpus:

- Corpus is the **training data** needed for the chatbot to learn.
- Without a corpus, it is impossible for a chatbot to learn and reply something useful back to the user.

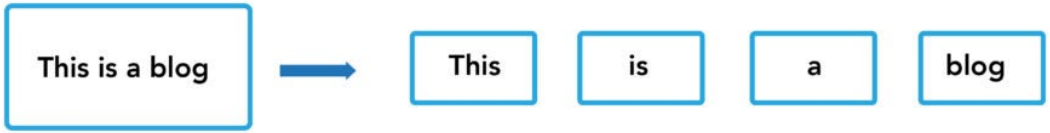
How does a chatbot work?

Data preprocessing - text case handling:

- Convert **all** the data coming as an input to either upper or lower case.
- This will **avoid** misrepresentation and misinterpretation of words if spelt under lower or upper cases.

How does a chatbot work?

Tokenization:



Tokenization is the structured process of converting a sentence into **individual** collection of words.

How does a chatbot work?

Stemming:

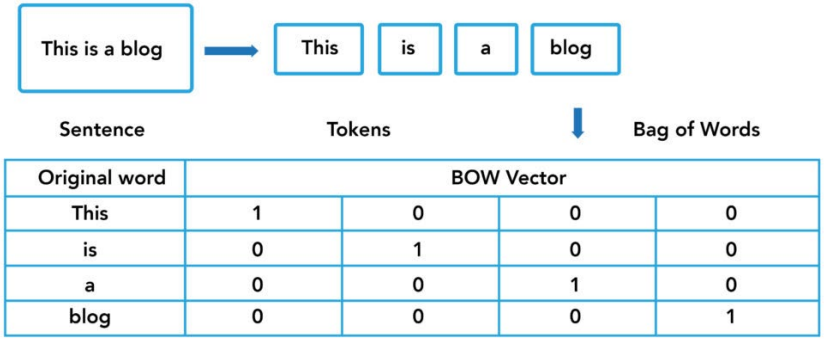
Original word	Root word	Similar words
Jump	Jump	Word with similar root word i.e. JUMP
Jumped	Jump	
Jumps	Jump	
Jumping	Jump	

Stemming is a process of finding **similarities**

between words with the same root words.

How does a chatbot work?

Generating Bag Of Words (BOW):



Original word	BOW Vector			
This	1	0	0	0
is	0	1	0	0
a	0	0	1	0
blog	0	0	0	1

Process of converting words into numbers by generating **vector embeddings** from the tokens generated.

How does a chatbot work?

One hot encoding:

Tag	One Hot encoded vector [11X11]										
This	1	0	0	0	0	0	0	0	0	0	0
is	0	1	0	0	0	0	0	0	0	0	0
a	0	0	1	0	0	0	0	0	0	0	0
blog	0	0	0	1	0	0	0	0	0	0	0
name	0	0	0	1	0	0	0	0	0	0	1

One hot encoding is a process by which categorical variables are converted into a form that ML algorithms use.

Practical demonstration using Python