# CREATE CHATBOT IN PYTHON

Phase 2 - Innovation

INTRODUCTION:

A chatbot in customer service is a computer program that uses AI and natural language processing to interact with customers. It's integrated into communication channels, like websites or messaging apps, and helps with tasks such as answering questions, providing recommendations, and processing orders. Chatbots offer 24/7 support, cost savings, quick responses, and data-driven insights, ultimately aiming to enhance customer satisfaction and streamline support processes for businesses.
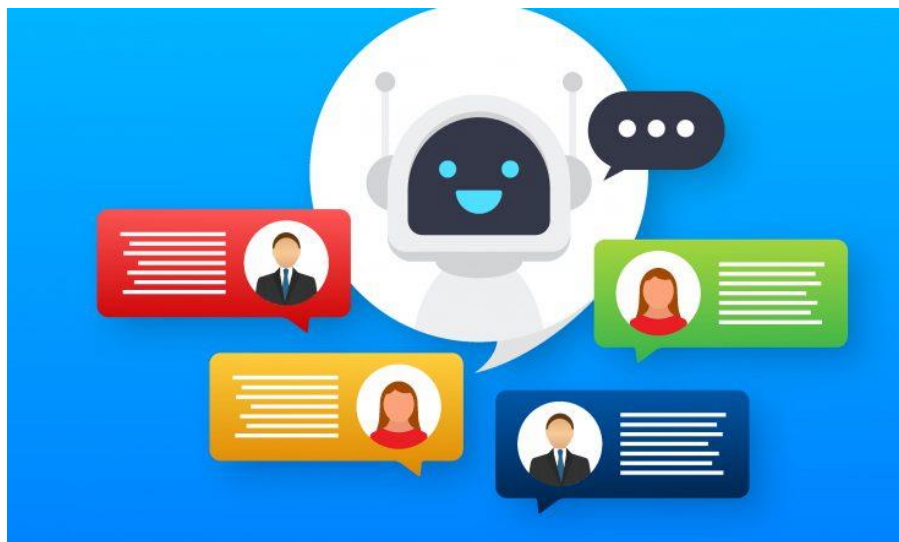
- AI-powered chatbots use a variety of AI techniques, including natural language processing (NLP), machine learning, and deep learning.
- NLP allows chatbots to understand the meaning of text, machine learning allows chatbots to learn from their experiences, and deep learning allows chatbots to generate more natural and engaging responses

INNOVATION:

To exploring advanced techniques like using pre-trained language models (e.g., GPT, BERT) to enhance the quality of responses.

DATA SOURCE:

The provided dataset consists of multiple short conversations between two participants, primarily focusing on casual and friendly exchanges. The conversations cover topics like greetings, well-being, attending school at PCC (a specific institution), and some small talk about the weather. Each conversation is structured as a back-and-forth dialogue between the participants, featuring natural language and informal communication

Dataset Link :(https://www.kaggle.com/datasets/grafstor/simple-dialogs-for-chatbot)

The dataset you have provided is an example of a conversational dataset. Conversational datasets are typically used to train chatbot models. The dataset contains a dialogue between two people, where each person takes a turn speaking. The dataset also includes the context of the conversation, which is important for training chatbot models to generate natural and informative responses.

Example of Dataset:

HI, HOW ARE YOU DOING?

I'M FINE. HOW ABOUT YOURSELF?

Pre-trained Language Models:

Pre-trained language models (PLMs) are a type of AI model that has been trained on massive datasets of text and code. PLMs are capable of generating text, translating languages, writing different kinds of creative content, and answering your questions in an informative way.

PLMs can be used to enhance the quality of chatbot responses in a number of ways. For example, PLMs can be used to:

➢ Generate more natural and engaging responses: PLMs can be used to generate responses that are more fluent and grammatically correct than those generated by rule-based chatbots. PLMs can also be used to generate responses that are more tailored to the specific context of the conversation.

➢ Answer questions more accurately: PLMs have access to a vast amount of knowledge, which allows them to answer questions more accurately than rule-based chatbots. PLMs can also be used to generate explanations for their answers, which can help users to understand why the chatbot gave the answer that it did.

➢ Personalize the chatbot experience: PLMs can be used to personalize the chatbot experience for each user. For example, PLMs can be used to learn the user's preferences and interests, and then use this information to generate more relevant and engaging responses.

Some popular PLMs that can be used for chatbots include:
- GPT
- BERT
- Bard
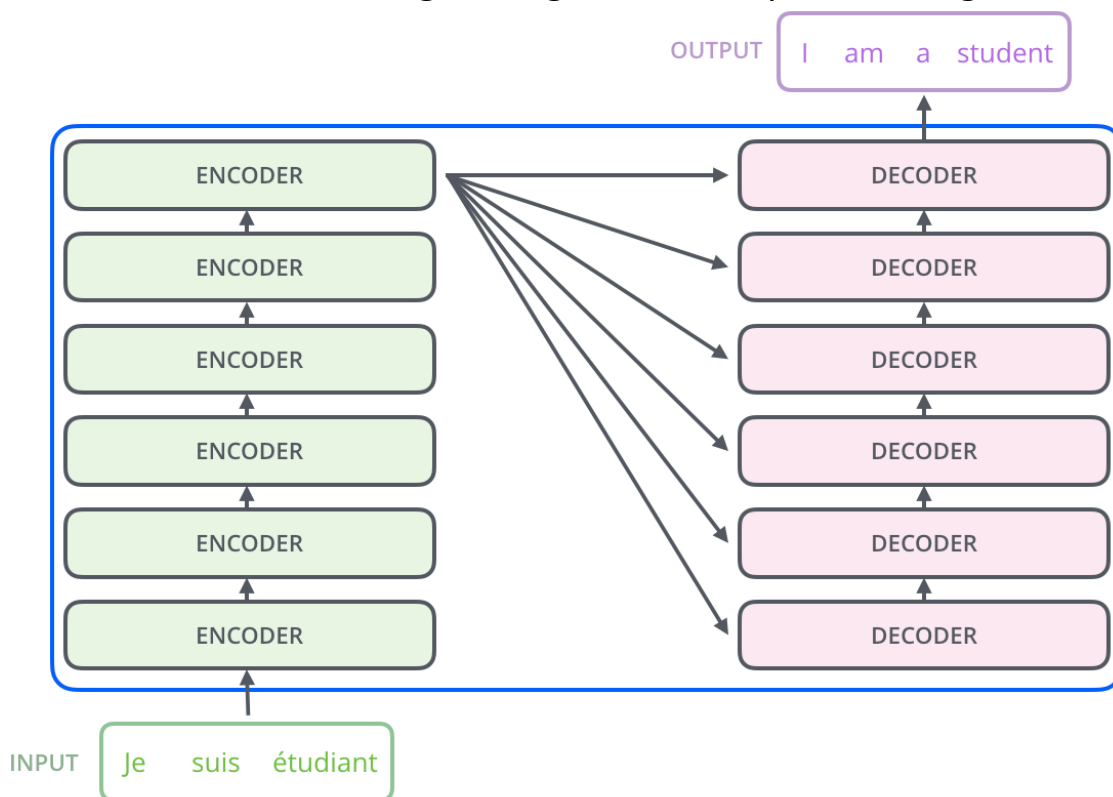- LaMDA(Language Model for Dialogue Applications)

Transformers:

Transformers are a type of neural network architecture that has been shown to be very effective for a variety of natural language processing (NLP) tasks, including machine translation, text summarization, and question answering. Transformers are also being used to develop new AI models such as image recognition and speech recognition models.

➤ Transformers are based on the encoder-decoder architecture, which is a common approach to NLP tasks. The encoder takes a sequence of input tokens, such as words in a sentence, and produces a sequence of hidden states. The decoder then takes the hidden states from the encoder and produces a sequence of output tokens.
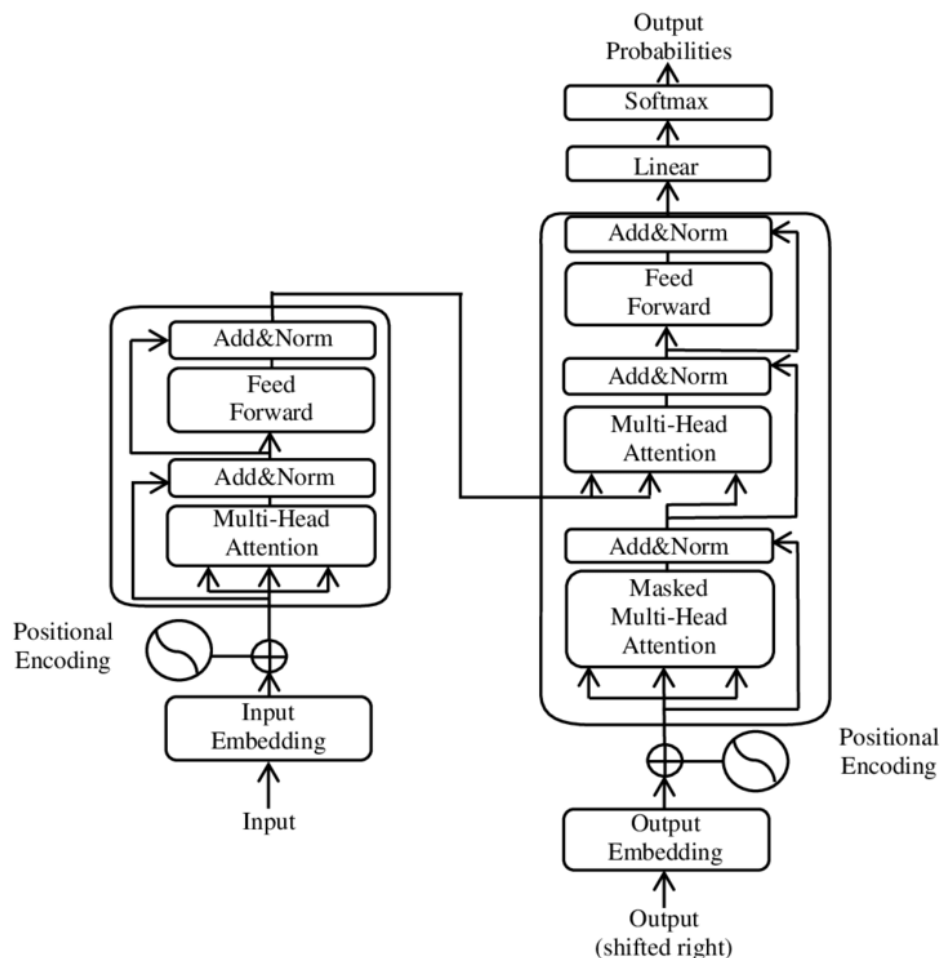
➢ Transformers use a self-attention mechanism to allow the encoder and decoder to attend to all of the input tokens at the same time. This allows the model to learn long-range dependencies in the input sequence.

➢ Transformers have been shown to be very effective for a variety of NLP tasks, and they are now the state-of-the-art for many of these tasks. Transformers are also being used to develop new AI models for tasks such as image recognition and speech recognition.

OUTPUT | I am a student

ENCODER	DECODER
ENCODER	DECODER
ENCODER	DECODER
ENCODER	DECODER
ENCODER	DECODER
ENCODER	DECODER

INPUT | Je suis étudiant

Here are some examples of how transformers are being used in AI today:

• Google Translate uses transformers to achieve state-of-the-art results in machine translation.

• Bard is a large language model from Google AI that is based on transformers. Bard can be used for a variety of tasks, including generating text, translating languages, writing different kinds of creative content, and answering your questions in an informative way

GPT MODELS:

❖ GPT models are a type of large language model (LLM) that have been trained on massive datasets of text and code. LLMs are a type of artificial intelligence (AI) model that can generate text, translate languages, write different kinds of creative content, and answer your questions in an informative way.

❖ GPT stands for Generative Pre-trained Transformer. It is a family of LLMs developed by OpenAI. GPT models are trained using a technique called unsupervised learning, which means that they are not given any labeled data. Instead, they are trained on a large dataset of text, and they learn to generate text by predicting the next word in a sequence.

Evolution from Transformer architecture to ChatGPT
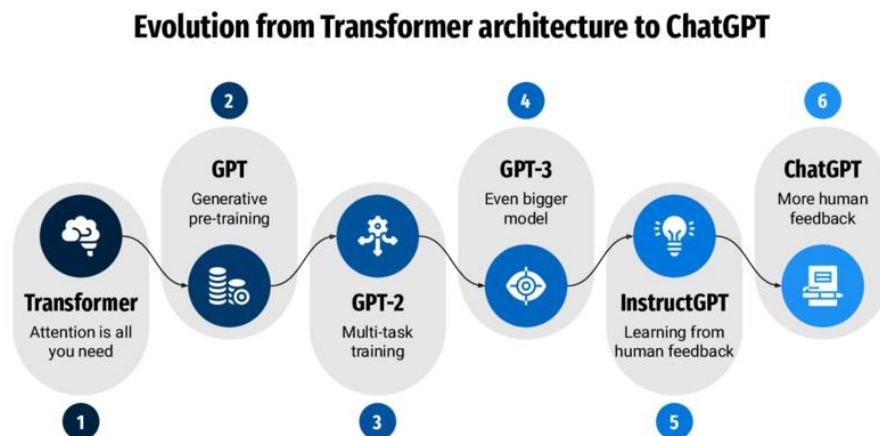
GPT models have been shown to be very effective at a variety of tasks, including:

➢ Generating text, such as creative content, code, and scripts
➢ Translating languages
➢ Answering questions in an informative way

GPT models are still under development, but they have the potential to revolutionize the way we interact with computers and the way we consume information.

Here are some examples of how GPT models are being used today:

▪ GPT-3 is also used by Amazon Alexa to answer questions more accurately and generate more personalized responses.
▪ Bard is a large language model from Google AI that is based on GPT-3.

BERT:

BERT is popular for chatbots because it can help to generate more natural and informative responses, answer questions more accurately, and personalize the chatbot experience for each user.

- ➢ BERT is a bidirectional language model, which means that it can take into account the context of both the words that come before and after a word in a sentence when generating a response. This makes BERT better at understanding the meaning of text and generating responses that are relevant to the context of the conversation.
- ➢ BERT has also been shown to be very effective at answering questions accurately. This is because BERT has access to a vast amount of knowledge, which allows it to provide comprehensive and informative answers to user queries.
- ➢ In addition, BERT can be used to personalize the chatbot experience for each user. For example, BERT can be used to learn the user's preferences and interests, and then use this information to generate more relevant and engaging responses.

Overall, BERT is a powerful tool that can be used to create chatbots that are more natural, informative, and engaging for users. This is why BERT is so popular for chatbots today.

Here are some specific examples of how BERT is being used in chatbots today:

- ➢ Google Assistant uses BERT to generate more natural and engaging responses to user queries.
- ➢ Amazon Alexa uses BERT to answer questions more accurately and generate more personalized responses.
- ➢ Bard is a large language model from Google AI that can be used to enhance chatbot responses in a variety of ways. For example, Bard can be used to generate more natural and engaging responses, answer questions more accurately, and personalize the chatbot experience for each user.

CONCLUSION:

We can use any of the models, GPT or BERT, to build the customer service chatbot that can be integrated in websites or applications.

➢ Choose a model: We need to choose a model based on the specific requirements of the chatbot. If we need a chatbot that can generate creative text formats or answer open ended, challenging, or strange questions, then GPT is a good option. If we need a chatbot that can understand the meaning of text and answer questions accurately, then BERT is a good option.

➢ Train the model: We need to train the model on a dataset of customer service conversations. The dataset should contain a variety of conversations, including both simple and complex questions, as well as both positive and negative feedback.

➢ Integrate the model into the website or application: Once the model is trained, we need to integrate it into the website or application. This can be done using a variety of methods, such as using a chatbot API or deploying the model to a server.