1. **Introduction {with citations}**

* 1. **What is a chatbot? And short history**

A chatbot is a computer program that understands the user input and gives a sensible and human readable response through the messaging application. To understand the user input, it uses Natural Language Processing (NLP) and machine learning techniques and generates the responses. Nowadays chatbots are used for many things. Since it can be programmed for automated responses, companies use it for customer service, which helps to reduce the support costs.

The first chatbot was created in 1966 by Joseph Weizenbaum. It was designed to have conversation with psychotherapist. This bot passed the Turing test that means human beings are unable to distinguish the machine from another human. Chatbot now uses more advanced NLP and AI which make it more powerful.

* 1. **What are the significances of chatbot?**

Chatbot is advanced nowadays. With advancement come advantages and disadvantages. Some of its significances are explained below:

* **Cost-effective:**

Chatbot is a cheap and one-time investment instead of human resource. It reduces costly problems caused by human error. It can give responses to a huge amount of user input without any error once programmed.

* **Availability:**

Once the chatbot is programmed it is available 24/7. It is useful for customer service and support as users get support outside office hours, which helps user experience.

* **Scalability:**

Chatbot can handle a lot of users at once which helps an organization to grow. It benefits the organization as it can manage interaction with a lot of users with their queries.

* **Speed:**

It is fast because instead of dealing with customer service you can just ask for a prompt and get a response for what you need.

* **Efficient:**

Since it is a programmed platform there is very little chance of mistake and it takes a lot less time and effort instead of a human resource.

* 1. **What are types of chatbot?**

Chatbot is programmed to have conversations with human users to understand the user input that provides readable and sensible responses. To understand these user input, we have many types of chatbot. Some of them are explained below:

* **Rule-based chatbots:**

Rule-based chatbot gives response on basic of predefined set of rules recognizing the user input. It uses if/then logic to have a conversation with user. It is mostly used in customer service and support in organizations. It is created by developers and is based on specific keywords or patterns in user inputs. It analyzes the user input text and tries to match with pre-defined rules if not found. It uses a decision tree and generates the response accordingly.

* **AI-based chatbots:**

AI based chatbot are those chatbot that are trained to have human-like

responses using a Natural Language Processing (NLP). It can gather data from user behaviors. It is constantly learning from the conversation with the users which improves the quality of response over time. It can be used for many industries like customer service, sales and marketing.

* **Hybrid chatbots:**

Hybrid chatbot is combination of both rule-based chatbot and AI based chatbot. It uses a rule-based chatbot to generate responses for the frequently asked input and AI-chatbot for the response that doesn’t have pre-defined rules which makes it more powerful from both of chatbots.

**1.4 What is ChatGPT ? Discuss along with its history and differences with normal**

**chatbots.**

1.5 How chatGPT works? Explain with diagram.