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Assignment 10

Title: Develop elementary chatbot for suggesting investment as per the customer needs. System Requirements: Java JDK, Visual Studio/Netbeans

Theory:

- A chatbot (also known as a talkbot, chatterbot, Bot, IM bot, interactive agent, or Artificial Conversational Entity) is a computer program or an artificial intelligence which conducts a conversation via auditory or textual methods. Such programs are often designed to convincingly simulate how a human would behave as a conversational partner, thereby passing the Turing test. Chatbots are typically used in dialog systems for various practical purposes including customer service or information acquisition. Some chatterbots use sophisticated natural language processing systems, but many simpler systems scan for keywords within the input, then pull a reply with the most matching keywords, or the most similar wording pattern, from a database.
- The term "ChatterBot" was originally coined by Michael Mauldin (creator of the first Verbot, Julia) in 1994 to describe these conversational programs. Today, most chatbots are either accessed via virtual assistants such as Google Assistant and Amazon Alexa, via messaging apps such as Facebook Messenger or WeChat, or via individual organizations' apps and websites. Chatbots can be classified into usage categories such as conversational commerce (e-commerce via chat), analytics, communication, customer support, design, developer tools, education, entertainment, finance, food, games, health, HR, marketing, news, personal, productivity, shopping, social, sports, travel and utilities.

Chatbots Work on Pattern Recognition and a Set of Algorithms:

Most chatbots work on a basic model of:

1. Entities: The thing the user is talking about.
2. Intents: The question the user asks the chatbot.
3. Responses: The answer the chatbot provides. It identifies the appropriate predefined responses from its repository. It then selects the most appropriate answer based on the intent and context. The repository is often confined to linguistic building blocks, but the real value comes from structured information it can mine from elsewhere.

Creating a Chatbot that Uses AI

These systems use machine learning and natural language processing (NLP) to interpret text like a person and find the right answer. They can also use visual information, such as facial recognition and images. Companies such as Amazon, Google, IBM and Microsoft, offer machine learning AI platforms you can use to power your own AI-driven chatbot.

Natural Language Processing

Natural language processing involves breaking down sentences and other parts of language, into components. It processes the semantics of the content to identify things like the entities and intents of the user. This has been a hard problem for computer science to tackle, but recent advances in the field have made this feasible.

Machine Learning

These systems use a corpus (a body of content) to retrieve the correct answer. Machine learning works best with massive repositories. So it will often include open-source repositories, such as structured Wikipedia. It uses algorithms to manipulate the data - particularly, linguistic pattern matching to find and score the information in the corpus. It continues to improve its responses based on its interactions with users. In other words, the machine learns.

Feeding the Bots

- To help the machine learn, subject matter experts train it by uploading pairs of questions and answers. This enables the system to check the results of its learning for accuracy against the real world. This is called the ground truth. It can apply this learning to any new information added to the corpus or through user feedback.
- You can also use unstructured content to help the system learn, where it contains relevant information. This might be in articles and blog posts. Platforms such as IBM Watson can process a corpus of unstructured content. However, you do need structured content when you're developing the system - as those question and answer key pairs. Objective: To deveop an elementary chatbot using Java Outcome: An elementary chatbot is designed.

Input: Keywords such as “hii”, “hello”, “banks”, “finance”, “shares”, etc.

Output: Output by chatbots based on different inputs by user.

Result / Conclusion: Chatbot is the functionality used for conversation in a textual format. A chatbot is designed by using Java.

Program:

```
import java.util.ArrayList;
import java.util.HashMap;
import java.util.Map;
import java.util.Random;
import java.util.Scanner;

public class chatbot{

Map<String, String> nouns = new HashMap<String, String>();
Map<String, String> welcome = new HashMap<String, String>();
Map<String, String> farewell = new HashMap<String, String>();

boolean exit = false;

ArrayList<String> keywords;

public chatbot(){
```

```
nouns.put("money", "\tWhere??(finance/invest/loan/shares)");
nouns.put("finance", "\tMany firms provide loan options");
nouns.put("invest", "\tYes, offcourse. Basically there are many options to invest. Regional Or Investment Banks?");
nouns.put("shares", "\tWhich company shares?");
nouns.put("loan", "\tWhich loan? Housing ,Personal,Educational. I recommend to visit SBI website for this");
nouns.put("investment", "\tWell there are many such as UBS, Barclays, Deutsche Bank, HSBC, Wells Fargo");
nouns.put("regional", "\tThere are many SBI, IDBI, Kotak Mahindra");

welcome.put("hii", "\tWelcome! How can I help you??");
welcome.put("hey", "\tHey, how I can help you??");
welcome.put("hello", "\tHello,How can I help you??");
welcome.put("thankyou", "\tWelcome");
welcome.put("howareyou", "\tI am fine, thanks. you?");
welcome.put("fine", "\tThat's greate");

farewell.put("bye", "\tBye");
farewell.put("bbye", "\tBbye");

}
	public static void main(String[] args) {

Scanner s = new Scanner(System.in);
chatbot c = new chatbot();

while(true) {
	String input = s.nextLine();
	String output = c.giveans(input);
	System.out.println(output);
	if (c.exit)
		break;
}
}

public String giveans(String input) {
Random rand = new Random();
keywords = new ArrayList<String>();
String tokens[] = input.split("\\s");

for (int i = 0; i < tokens.length; i++) {
	if (welcome.containsKey(tokens[i].toLowerCase())) {
```

```
                return welcome.get(tokens[i]);
        } else if (farewell.containsKey(tokens[i].toLowerCase())) {
                return farewell.get(tokens[i]);
        } else if (nouns.containsKey(tokens[i].toLowerCase())) {
                return nouns.get(tokens[i]);
        }
}
return ("I am sorry. I don't get this.");
}
```

}Output: