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Project 2: Chatbot

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II. Introduction

Welcome to Catbot!

Where all your dreams and happiness of learning about cat jokes and cat facts are all gathered in one place!

To get started, let us first begin by grabbing a close friend or pet, sit down together, and start learning about these mysterious creatures called 'cats'.

Our chatbot has been created **from scratch**.

You should expect reasonable responses given reasonable input. And we hope that you enjoy our program.

III. Techniques Used

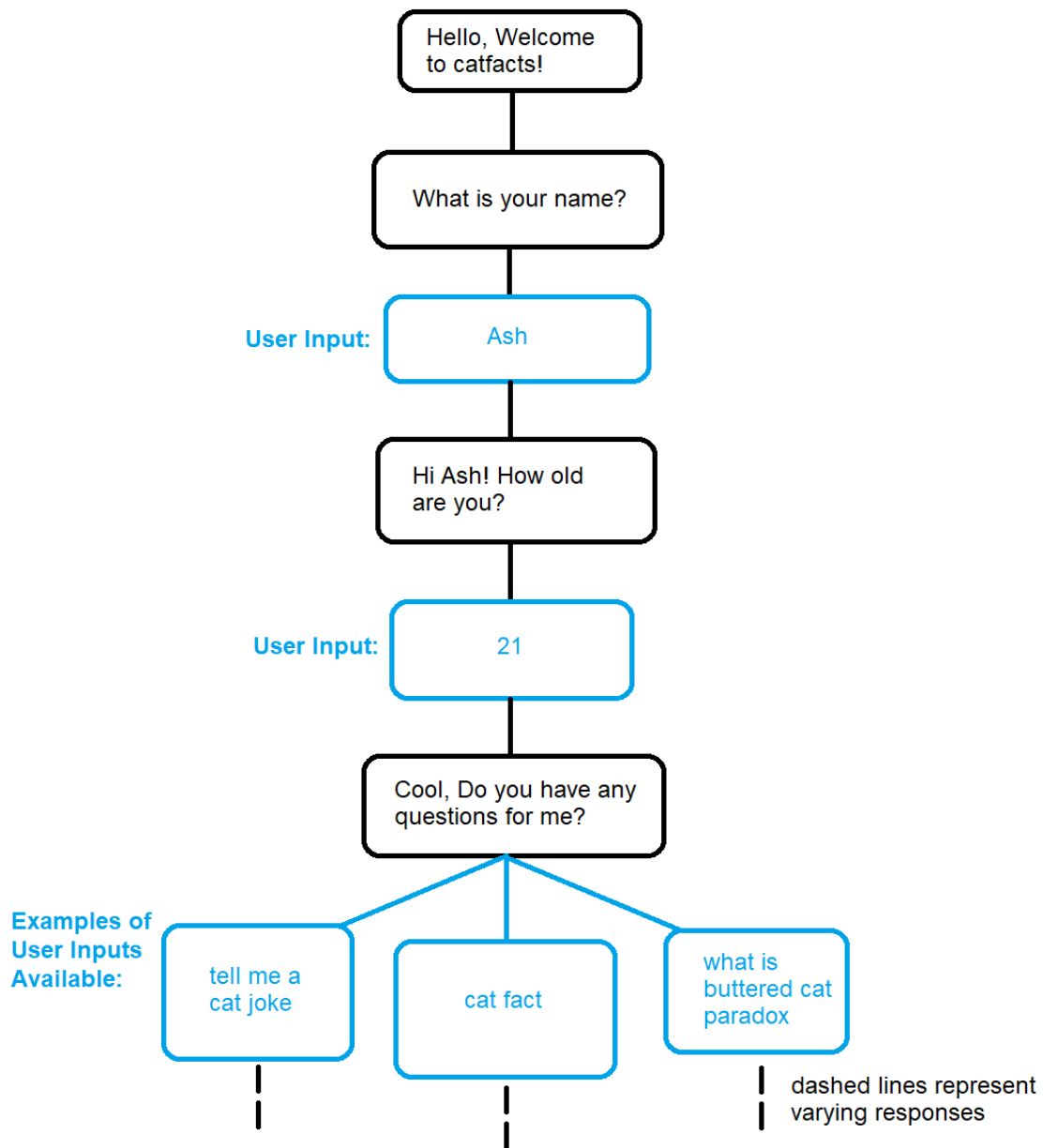
The NLP techniques Catbot uses are **cosine similarity**, **user input parsing**, and **information retrieval** (looking up online for information/knowledge base).

Cosine Similarity is used for measuring any similarity between two vectors of any two non-zero vectors. In this project, cosine similarity is used for finding similarity between different words. For example, one user may ask to Catbot "could you tell me a joke", while another user could write "tell me cat joke". Cosine similarity allows these two inputs to provide the same output.

User Input Parsing is used for working together with cosine similarity. Parsing data means to extract important information for future use. One example of user input parsing is when the user would tell Catbot his/her own name, Catbot would turn that information into data, then store it in a dictionary to allow it for further use.

Information Retrieval is used for two things. One is to look up any unknown information online. We use Wikipedia to output the user any information not stored in the knowledge base. The other use is for getting the user input parsed information and retrieve it. After it retrieves it, Catbot would be able to tell if the same user is back by acknowledging his/her name.

IV. Catfact's Logic Diagram



V. Sample Dialog Interactions

Example of rules:

```
# Rules
responses = [
[
    ["hi", "hello", "sup", "hey", "hola", "howdy"],
    [ "Hello friend!", "Hi there!", "Hola amiga!", "Hey there!"]
],
[
    ["help", "help me"],
    ["I can help you ", "No, let me help you", "I can't help you"]
],
[
    ["how old are you", "old"],
    ["Just 2 weeks", "Ask my creator"]
],
[
    ["who made you", "who is your creator"],
    ["I was created by Aashritha and Zen.", "I do not know"]
],
[
    ["your name", "what is your name", "who are you", "what"],
    ["My name is CatBot, meow!", "Hi, I'm CatBot, meow!"]
],
[
    ["how are you", "what's up", "what are you doing"],
    ["I'm just living in your computer " + user_name]
],
[
    ["joke", "tell me a joke", "what's a joke", "do you know a joke", "funny", "you're funny"],
    jokelist
],
[
```

Sample Dialog Interaction 1:

```
Hello, Welcome to catfacts!
To quit, type 'bye' or 'quit' or 'exit'

Catbot: What is your name?
You: Ash
Catbot: Hi Ash! How old are you?
You: 21
Catbot: Cool, Do you have any questions for me?
You: hi
CatBot: I know right!
You: hello
CatBot: Hello friend!
You: what is your name
CatBot: Hi, I'm CatBot, meow!
You: you're dumb
CatBot: *sad cat noises* meow :(
You: tell me a joke
CatBot: What do you call a cat who loves to bowl? An alley cat!
You: you're funny
CatBot: Why was the cat afraid of the tree? Because of its bark!
You: tell me a cat fact
CatBot: Collective nouns for adult cats include "clowder," "clutter," "glaring," and "pounce."
You: dinosaur
Let me look that up for you! Here is a wikipedia article:
Dinosaurs are a diverse group of reptiles of the clade Dinosauria.
They first appeared during the Triassic period, between 243 and 233.23
million years ago, although the exact origin and timing of the
evolution of dinosaurs is the subject of active research.
You: bye
Bye Ash, see you later!
```

Sample Dialog Interaction 2: (using knowledge base)

```
Hello, Welcome to catfacts!
To quit, type 'bye' or 'quit' or 'exit'

Catbot: What is your name?
You: Ash
Catbot: Hi Ash, you're back!!
You: hi
CatBot: meow...
You: I love pizza
CatBot: I love cats!
You: I love pancakes
CatBot: And I love you, meow!
You: I hate spiders
CatBot: And I hate it too!
You: I hate the sky
CatBot: I know you hate spiders too, Ash!
You: I love burgers
CatBot: Cool, me too
You: I love cakes
CatBot: I know you love pizza too, Ash!
You: quit
Bye Ash, see you later!
```

Note: Here, Catbot will know who you are by saving your information into a user model. The information gets stored when you type in your 'likes' and 'dislikes'. It will remember your previous responses from past interactions.

Sample Dialog Interaction 3:

```
Hello, Welcome to catfacts!
To quit, type 'bye' or 'quit' or 'exit'

Catbot: What is your name?
You: Teddy
Catbot: Hi Teddy! How old are you?
You: 63
Catbot: Cool, Do you have any questions for me?
You: I love the sky
CatBot: I love it too!
You: I love cats
CatBot: Cool, me too
You: I hate mornings
CatBot: And I hate it too!
You: I hate Mondays
CatBot: I know you hate mornings too, Teddy!
You: I love rain
CatBot: And I love you, meow!
You: exit
Bye Teddy, see you later!
```

VI. Likert-Scale Questionnaire

scale guide:

0 being lowest satisfaction | 5 being highest satisfaction

User 1:

Question 1: Was the chatbot interesting and responded well?

response: **5**

Question 2: Did the chatbot felt like a human speaking?

response: **3**

Question 3: Were there any issues with the chatbot?

response: **5**

User 2:

Question 1: Was the chatbot interesting and responded well?

response: **4**

Question 2: Did the chatbot felt like a human speaking?

response: **2**

Question 3: Were there any issues with the chatbot?

response: **4**

User 3:

Question 1: Was the chatbot interesting and responded well?

response: **5**

Question 2: Did the chatbot felt like a human speaking?

response: **2**

Question 3: Were there any issues with the chatbot?

response: **5**

VII. Appendix A. Knowledge Base

Knowledge Base:

The knowledge base of facts and jokes are stored into pickle files. When the program starts, the pickle file is read, then gives an output to the user once the user requests for a fact or a joke.

Cat Jokes Knowledge Base:

```
Cat Jokes Knowledge Base
- kes you'll find on the internet!
- What do cats like to eat on a hot day? A mice-cream cone!
- Why do cats always get their way? They are very purr-suasive!
- How do two cats end a fight? They hiss and make up!
- What should you use to comb a cat? A catacomb!
- What is a cat's favorite movie? The Sound of Mewsic!
- How do you know a cat is agitated? He's having a hissy fit!
- What's a cat's favorite magazine? Good Mousekeeping!
- Why did the cat wear a fancy dress? She was feline fine!
- What's a cat's favorite color? Purr-ple!
- Why was the cat afraid of the tree? Because of its bark!
- What did the cat say when it was confused? "I'm purr-plexed!"
- What's a cat's favorite dessert? Chocolate mouse!
- Where does a cat go when it loses its tail? The re-tail store!
- What do you call a cat who lives in an igloo? An eskimew!
- How do cats stop crimes? They call claw enforcement!
- Why was the cat so agitated? Because he was in a bad mewd!
- What do you call a cat who loves to bowl? An alley cat!
- What do cats love to do in the morning? Read the mewspaper!
- How is cat food sold? Usually, purr the can!
```

Cat Facts Knowledge Base:

Cat Facts Knowledge Base

- Cats are believed to be the only mammals who don't taste sweetness.
 - Cats are nearsighted, but their peripheral vision and night vision are much better than that of humans.
 - Cats are supposed to have 18 toes (five toes on each front paw; four toes on each back paw).
 - Cats can jump up to six times their length.
 - Cats' claws all curve downward, which means that they can't climb down trees head-first. Instead, they have to back down the trunk.
 - Cats' collarbones don't connect to their other bones, as these bones are buried in their shoulder muscles.
 - Cats have 230 bones, while humans only have 206.
 - Cats have an extra organ that allows them to taste scents on the air, which is why your cat stares at you with her mouth open from time to time.
 - Cats have whiskers on the backs of their front legs, as well.
 - Cats have nearly twice the amount of neurons in their cerebral cortex as dogs.
 - Cats have the largest eyes relative to their head size of any mammal.
 - Cats make very little noise when they walk around. The thick, soft pads on their paws allow them to sneak up on their prey – or you!
 - Cats' rough tongues can lick a bone clean of any shred of meat.
 - Cats use their long tails to balance themselves when they're jumping or walking along narrow ledges.
 - Cats walk like camels and giraffes: They move both of their right feet first, then move both of their left feet. No other animals walk this way.
 - Male cats are more likely to be left-pawed, while female cats are more likely to be right-pawed.
 - Though cats can notice the fast movements of their prey, it often seems to them that slow-moving objects are actually stagnant.
 - Some cats are ambidextrous, but 40 percent are either left- or right-pawed.
 - There are cats who have more than 18 toes. These extra-digit felines are referred to as being "polydactyl."
- Facts About Cat Health & Wellness
- A cat's average lifespan increased by a year over the span of time between 2002 and 2012, according to a study by Banfield Pet Hospital.

Live Lookup Example (using Wikipedia):

Hello, Welcome to catfacts!

To quit, type 'bye' or 'quit' or 'exit'

Catbot: What is your name?

You: *Ted*

Catbot: Hi Ted! How old are you?

You: *32*

Catbot: Cool, Do you have any questions for me?

You: *pizza toppings*

Let me look that up for you! Here is a wikipedia article:

Pizza (Italian: ['pittsa], Neapolitan: ['pittsə]) is a dish of Italian origin consisting of a usually round, flat base of leavened wheat-based dough topped with tomatoes, cheese, and often various other ingredients (such as anchovies, mushrooms, onions, olives, pineapple, meat, etc.), which is then baked at a high temperature, traditionally in a wood-fired oven. A small pizza is sometimes called a pizzetta.

You: *bones*

CatBot: Any more questions for me?

You: *goldfish*

Let me look that up for you! Here is a wikipedia article:

The goldfish (*Carassius auratus*) is a freshwater fish in the family Cyprinidae of order Cypriniformes. It is commonly kept as a pet in indoor aquariums, and is one of the most popular aquarium fish.

You: *bye*

Bye Ted, see you later!

VIII. Appendix B. User Models

User Model:

The user model contains key information such as the likes and dislikes of a user. When the user mentions that they like sunsets in the conversation, the Catbot will bring this up later by saying ‘I know you like sunsets too, Ash!’ for a personalized response.

In this user model dictionary, the key is the user’s name, the value is another dictionary with keys ‘Age’, ‘likes’, and ‘dislikes’ with user input stored as the values

Additionally, whenever the user quits the program, the user model is stored in a pickled file and unpickled when the user runs the program again

Example of Catbot recognizing the User:

```
Name: Ash
{'Age': '21', 'likes': ['pizza ', 'pancakes ', 'burgers ', 'cakes '], 'hates': ['spiders ', 'the sky ']}
Name: Teddy
{'Age': '63', 'likes': ['the sky ', 'cats ', 'rain '], 'hates': ['mornings ', 'mondays ']}
Name: Fish
{'Age': '2', 'likes': ['sunrises ', 'nlp ', 'music ', 'you '], 'hates': ['school ', 'homework ']}
Hello, Welcome to catfacts!
To quit, type 'bye' or 'quit' or 'exit'

Catbot: What is your name?
You: Teddy
Catbot: Hi Teddy, you're back!!
You:
```

User Model Example:

```
Name: Ash
{'Age': '21', 'likes': ['pizza ', 'pancakes ', 'burgers ', 'cakes '], 'hates': ['spiders ', 'the sky ']}
Name: Teddy
{'Age': '63', 'likes': ['the sky ', 'cats ', 'rain '], 'hates': ['mornings ', 'mondays ']}
Name: Fish
{'Age': '2', 'likes': ['sunrises ', 'nlp ', 'music ', 'you '], 'hates': ['school ', 'homework ']}
```