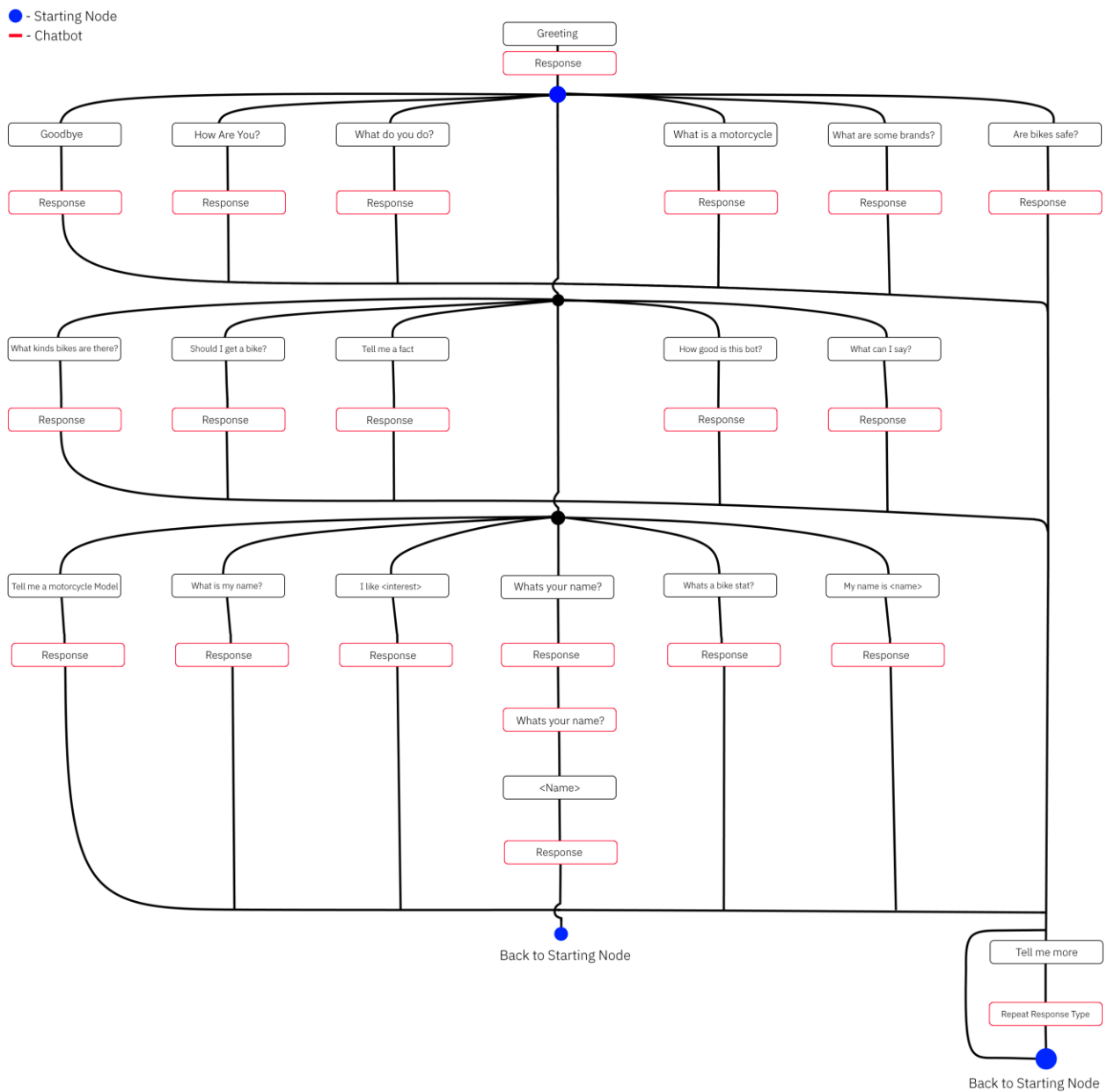


System Description

This chatbot is a motorcycle chatbot capable of providing users with various motorcycle facts, statistics, definitions, and examples of motorcycles. All possible responses are stored in the knowledge base JSON. Each response is associated with a “tag” which signifies what type of user input the response is meant for. These tags also contain example user inputs called patterns which are used by a neural network to learn text patterns to classify user inputs as one of the tags. To create a neural network model, I took in the input patterns and stemmed them using nltk’s LancasterStemmer module. The model would then be trained on the stemmed patterns and corresponding tags. Once a model is made, the chatbot can run off of it. When running, the bot prompts a user for input. This input gets stemmed and passed into the model for predictions. The tag with the highest prediction is selected and a random response from that class is selected to give the user. In special cases, when a user gives the bot their name or likes/interests, these responses will be saved to a user model. When a tag is predicted that asks the bot what they know about the user, it will reply with the name and interests of the user if they are known.

Dialog Diagram



Sample Dialog Interactions

Example 1

```
Say something to get started!
Or say " Example Prompts " to see examples
>> Human: Hello!
>> Chatbot: Hello!
>> Human: What is your name?
>> Chatbot: I'm Nik's amazing chat bot that deserves an A+, but you can call me Bob
>> Chatbot: What is your name?
>> Human: Nikolas
>> Chatbot: Nice to meet you Nikolas
>> Human: What do you do?
>> Chatbot: I am a chatbot that can answer some questions about motorcycles!
>> Human: What can you tell me?
>> Chatbot: Sonny Barger, the founder of the Hell's Angels wrote in his autobiography that he
prefers Japanese bikes over Harley-Davidsons.
>> Human: What is a motorcycle?
>> Chatbot: It's a two-wheeled vehicle that is powered by a motor
>> Human: Tell me more.
>> Chatbot: Motorcycles, motorbikes, or bikes, are essentially two wheeled motorized vehicles.
>> Human: Tell me a motorcycle fact
>> Chatbot: The first Harley Davidson motorcycle, built in 1903, used a tomato soup can for a
carburetor.
>> Human: What else can you tell me
>> Chatbot: Technically, up to eight motorcycles can fit into the same parking space occupied
by one car.
>> Human: Are motorcycle dangerous?
>> Chatbot: Motorcycles are more risky when compared to cars.
>> Human: Should I buy a motorcycle?
>> Chatbot: Definitely! They're greatly fun and exciting but continuously keep in mind to be
secure and ride in you limits!
>> Human: I like motorcycles alot.
>> Chatbot: Cool!
>> Human: What do you know about me?
>> Chatbot: Your name is Nikolas
>> Chatbot: You also told me youlike motorcycles alot.
```

Example 2

```
Say something to get started!
Or say " Example Prompts " to see examples
>> Human: Hello!
```

```
>> Chatbot: Hello!
>> Human: What is your name
>> Chatbot: I'm Nik's amazing chat bot that deserves an A+, but you can call me Bob
>> Chatbot: What is your name?
>> Human: Bobby
>> Chatbot: Nice to meet you Bobby
>> Human: What are some motorcycle stats?
>> Chatbot: 35% of all motorcycle accidents occur in an intersection.
>> Human: What type of bikes are there
>> Chatbot: Here are some types of motorcycles; Standard, Cruiser, Sport, Touring, Sport-
Touring, Dual Sport, Scooter, Moped, Dirt Bike/Offroad
>> Human: Give me a motorcycle model
>> Chatbot: Honda CBR500R
>> Human: Tell me more
>> Chatbot: Honda CBR500R
>> Human: tell me more
>> Chatbot: Yamaha XSR700
>> Human: How good is this bot?
>> Chatbot: This bot is spectacular so I think a 98% is fair.
```

Knowledge Base

This is a list of the various responses that the chatbot can reply to a user with;

"Hello!"	"There's a lot of brands the \"Big Four\" are; Honda, Yamaha, Kawasaki, and Suzuki"
"Welcome!"	
"Hi there!"	"If you want a 'MURICAN motorcycle, then look no further than Harley Davidson. But if you want a good one, look at Japanese manufacturers like Honda, Yamaha, and Kawasaki"
"Bye!"	
"Goodbye!"	
"How are you?"	
"How you doing?"	"Motorcycles are more risky when compared to cars."
"Hows it going"	
"I'm doing well thank you."	"Motorcycles are less safe than 4-wheeled vehicles."
"I am a chatbot that can answer some questions about motorcycles!"	"Motorcycles are more dangerous than other modes of transport, and can be intimidating if you're new."
"I am a motorcycle chatbot."	
"I'm Nik's amazing chat bot that deserves an A+, but you can call me Bob"	"Here are some types of motorcycles; Standard, Cruiser, Sport, Touring, Sport-Touring, Dual Sport, Scooter, Moped, Dirt Bike/Offroad"
"Motorcycles, motorbikes, or scooters, are primarily two wheeled motorized vehicles."	"I wouldn't recommend buying one with no experience however you should swing by a local dealer to learn more!"
"It's a two-wheeled vehicle that is powered by a motor"	"Yes! They're extremely fun and thrilling but always remember to be safe and ride within you limits!"
"Motorcycles, motorbikes, or bikes, are essentially two wheeled motorized vehicles."	"Definitely! They're greatly fun and exciting but continuously keep in mind to be secure and ride in you limits!"
"There are many manufacturers of motorcycles, here are a few; Honda, Yamaha, Suzuki, Kawasaki, Harley Davidson, Ducati, Triumph, Aprilia, Norton, and BMW"	"On average, motorcycles are about twice as fuel efficient as cars."

"The first Harley Davidson motorcycle, built in 1903, used a tomato soup can for a carburetor."

"The first motorcycle rider to ever go over 300 mph was Don Vesco in 1975, on a 1496cc Yamaha-engined streamliner."

"When rounding corners, 75% of a bike's grip comes from the front tire."

"The German inventor Gottlieb Daimler is generally credited with building the first practical motorcycle in 1885."

"The record for the longest-ever backwards motorcycle ride was set by Dipayan Choudhury in Jabalpur, India on October 7, 2014, lasting 125.52 miles"

"Motorcyclists in Indiana only have to stop for 120 seconds at a red stop light. They can treat the stop light as if it were a stop sign, then proceed through the intersection cautiously."

"Only about 30% of all stolen motorcycles are recovered, which is half of all automobiles at 60% recovery."

"The greatest motorcycles of all time are the Kawasaki Z650 and the Triumph Street Triple R because that's what my creator owns."

"Front motorcycle tires dispense water at three times the rate of rear tires."

"British inventor Edward Butler is credited with coining the term 'motorcycle' when inventing a 3-wheeled petrol vehicle in 1884."

"It is estimated that 1 in 5 bikes that are not garaged get stolen, but insurance companies estimate that nearly 25% of bike theft claims are in fact fraudulent."

"In addition to motorcycles, Kawasaki also builds ships, power plants, industrial equipment, robots, and spaceships."

"Technically, up to eight motorcycles can fit into the same parking space occupied by one car. "

"Sonny Barger, the founder of the Hell's Angels wrote in his autobiography that he prefers Japanese bikes over Harley-Davidsons."

"Japan built a motorcycle called the TOTO which was powered by human waste."

"Triumph makes golf balls in addition to motorcycles."

"Ducati started out as a radio-component company 13 years before before World War 2. "

"Modern sports-bike tires don't contain any actual rubber at all. They are made entirely from synthetic rubber, which is beneficial due to a balance between durability and traction."

"The fastest production motorcycle is the Kawasaki Ninja H2R with a top speed of 249 miles per hour (400 kph)."

"I am easily worth at least a 94%" "This bot is spectacular so I think a 98% is fair." "Good to know." "Nice to meet you."

"Tell me more" "continue"

"What do you want me to talk about?"

"You can ask things like; \"How good is this bot?\" or \"Tell me a motorcycle fact\" or \"Tell me a motorcycle model\" or \"What are some motorcycle stats?\""

"Motorcyclists are 29 times more likely to die in a crash than those in cars."

"35% of all motorcycle accidents occur in an intersection."

"1/3rd of motorcycle fatalities involved a motorcyclist over 50 and another 1/3rd were under 30"

"42% of motorcycle fatalities occurred on a 500 - 1000cc engine."

"25% of motorcyclists killed have prior speeding convictions."

"21% of motorcyclists killed have recorded suspensions or revocations of their license."

"28% of motorcyclists killed were above the legal BAC limit (alcohol-impaired)."

"Kawasaki Z125"

"Kawasaki Z400"

"Kawasaki Z650"

"Kawasaki Z900"

"Kawasaki Z650RS"

"Kawasaki Z900RS"

"Kawasaki ZH2"

"Kawasaki Ninja 400"

"Kawasaki Ninja 650"

"Kawasaki Ninja 1000SX"

"Kawasaki Ninja ZX-6R"

"Kawasaki Ninja ZX-10R"

"Kawasaki Ninja ZX-14R"

"Kawasaki Ninja H2"

"Kawasaki Versys 1000"

"Triumph Street Triple R"

"Triumph Speed Triple"

"Triumph Bonneville"

"Triumph Tiger 900"

"Harley Davidson Sportster Iron 883"

"Harley Davidson Sportster S"

"Harley Davidson Forty-Eight"

"Harley Davidson Iron 1200"

"Harley Davidson Fat Bob"

"Harley Davidson Fat Boy"

"Harley Davidson Sport Glide"

"Harley Davidson Softail"

"Honda CBR1000RR-R FireBlade"

"Honda CBR1000RR"

"Honda CBR600RR"

"Honda CBR500R"

"Honda CB1000R"

"Honda Goldwing"

"Honda Rebel 1100"

"Honda Rebel 500"

"Suzuki Hayabusa"

"Suzuki GSXR1000R"

"Yamaha MT03"

"Suzuki GSXR750"

"Yamaha MT07"

"Suzuki GSXR600"

"Yamaha XSR900"

"Suzuki Katana"

"Yamaha XSR700"

"Suzuki GSXS750"

"Yamaha Tracer 9"

"Suzuki SV650"

"Yamaha Bolt"

"Suzuki Boulevard"

"Yamaha WR450"

"Suzuki V-Strom"

"Yamaha Niken"

"Suzuki DRZ"

"I do not know who you are."

"Yamaha YZF-R1"

"That's interesting"

"Yamaha YZF-R6"

"Cool!"

"Yamaha YZF-R3"

"Noted"

"Yamaha MT10"

"Very cool"

"Yamaha MT09"

Sample User Models

Below are examples of the user models, which store the users name, likes/interests, and their response to “how are you” which I called their state.

```
user = {  
    "name": "Nikolas",  
    "likes": ["I like motorcycles", "I am interested in bikes", "I like NLP"],  
    "state": "I am well"  
}
```

```
user = {  
    "name": "John Doe",  
    "likes": ["I like programming", "I am a fan of the cowboys"],  
    "state": "I'm good"  
}
```

```
user = {  
    "name": "Jane Doe",  
    "likes": ["I am interested in money", "I like trains"],  
    "state": "I'm alright"  
}
```

Evaluation

Overall I think the chatbot is decent. It is able to determine the proper tags for user inputs fairly well and provides the responses. It is also able to relay the user info that is given back to them accurately. The bot can give users a large number of motorcycle models, and facts.

As for weaknesses of the bot, The user model is probably weakest. Given how I decided to go about making this chatbot there was not a lot of room for learning about the user as the main purpose was to give facts and answer basic motorcycle questions.