Chatbot Report

The process of making one?

When I started thinking about how I wanted to make my chatbot I never considered using a framework as that will take a long time to learn and I may never use one so I considered just writing it from scratch so that I can get better practice with Python and learn more NLP techniques that way I can maximize my time learning what I want to learn so I have those resources ready for when its needed at the job site as a future Software Engineer. I've also thought about how I can work on this project as fast as possible so when I first investigated making a chatbot I looked all over the internet on how to make one. I found many sources that were helpful, and I gathered enough resources that described approaches with using different models like Neural Network, TensorFlow, and TFLearn and I combined them into what is now my chatbot.

For my topic of choice, I wanted to do something with video games because I have strong interests in working at a video game company one day. And I love playing video games myself so when I make this chatbot that likes to talk about video games, it'll bring in an audience of gamers who can gain insight on what the bot might like and what the person talking to the bot may or may not like themselves. In terms of the type of games, I went with Nintendo because I believe everyone knows what Nintendo is and I want the bot to answer questions about Nintendo including Mario and the top 10 Nintendo games of all time. The diagram flow of the chatbot starts out with introducing myself and then following down the path of video games and then towards Nintendo topics and ending with our goodbyes and closing the program successfully chatting with a Chatbot about video games.
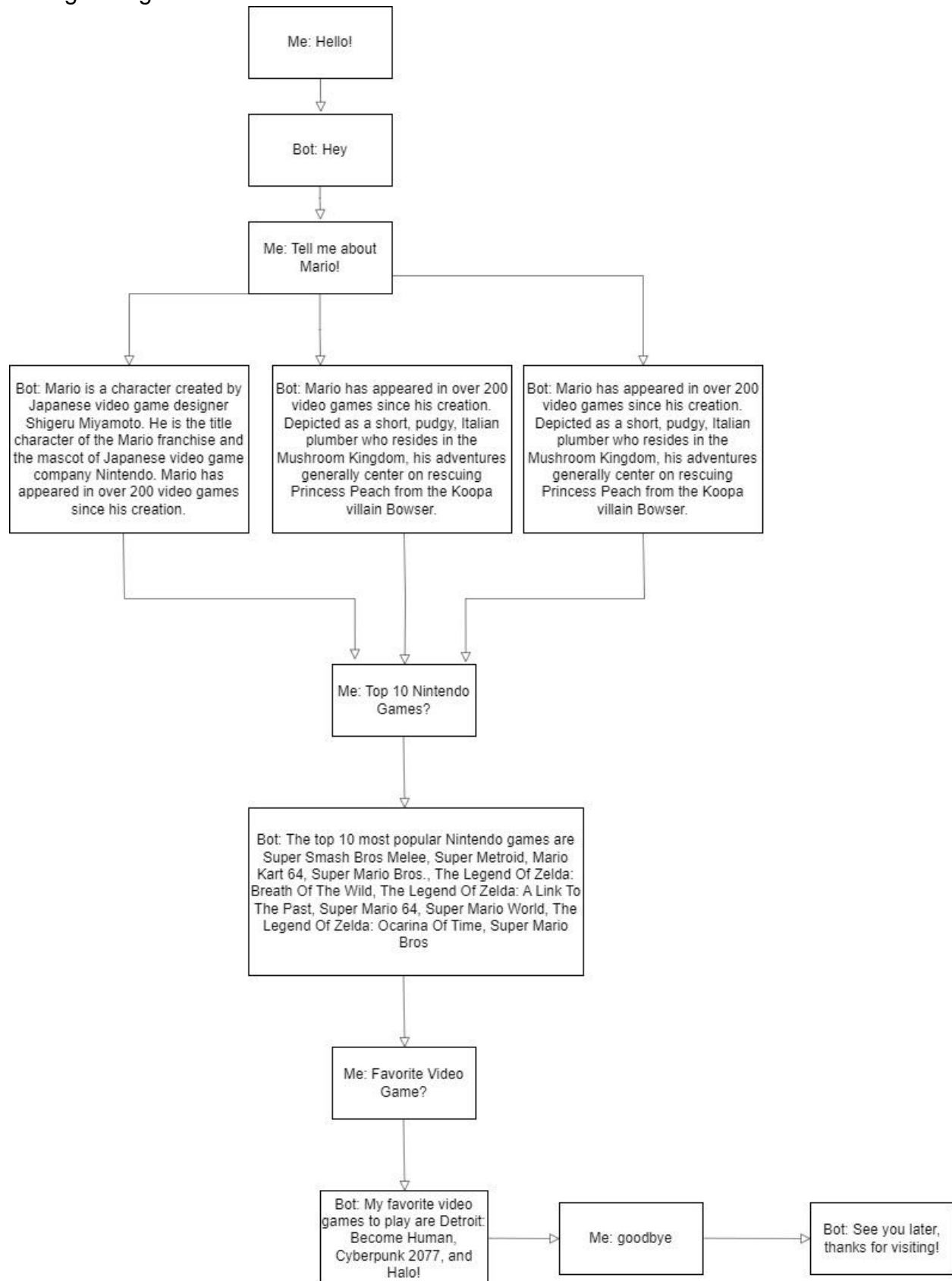
What models did I use for the chatbot? How does it work?

I start out by making my intents for the knowledge base which has tags that stores the patterns and responses. The tags that I use for this project are words that describe the true meaning of the question and response. In my Intents file, patterns are example user input with questions and/or words that the user may say to the bot. And responses are straight forward which it's the chatbots response to the question the user might ask about that certain topic or "tag". In every pattern in each tag, the pattern will be word tokenized and stored in a list called words. Also, the creation of docs_x is for the list of words and docs_y is the list of tags. The reason for this is it will be easier to classify our patterns when the model is being trained. After setting our patterns and intent[tags], words shouldn't have any duplicates when running the model so preprocessing the text by stemming the words is the first step and the second step is to use the sorted and set methods to not let any words repeat again.

To start setting up for modeling neural networks in our chatbot, a bag of words, also known as one hot encoding, is what represents the words in the patterns and process of setting the words from strings to integers of 0s and 1s. If the word is in the pattern, then that word is set to 1 and if not then it's set to 0. The entries will mostly be filled with 0s and couple of 1s depending on the length of the bag of words.

For building the model, the input data stores in the training array and for connecting the network with the training I've decided to do eight neurons as that is the safest number of neurons to train the model and for activation is to set to SoftMax which outputs the probability for each neuron of every layer.

Dialogue Logic:

```
                    ┌─────────────────┐
                    │   Me: Hello!    │
                    └─────────────────┘
                             │
                             ▼
                    ┌─────────────────┐
                    │    Bot: Hey     │
                    └─────────────────┘
                             │
                             ▼
                    ┌─────────────────┐
                    │ Me: Tell me about│
                    │      Mario!      │
                    └─────────────────┘
```

Bot: Mario is a character created by Japanese video game designer Shigeru Miyamoto. He is the title character of the Mario franchise and the mascot of Japanese video game company Nintendo. Mario has appeared in over 200 video games since his creation.

Bot: Mario has appeared in over 200 video games since his creation. Depicted as a short, pudgy, Italian plumber who resides in the Mushroom Kingdom, his adventures generally center on rescuing Princess Peach from the Koopa villain Bowser.

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Me: Top 10 Nintendo Games?

Bot: The top 10 most popular Nintendo games are Super Smash Bros Melee, Super Metroid, Mario Kart 64, Super Mario Bros., The Legend Of Zelda: Breath Of The Wild, The Legend Of Zelda: A Link To The Past, Super Mario 64, Super Mario World, The Legend Of Zelda: Ocarina Of Time, Super Mario Bros

Me: Favorite Video Game?

Bot: My favorite video games to play are Detroit: Become Human, Cyberpunk 2077, and Halo!

Me: goodbye

Bot: See you later, thanks for visiting!

```
Sean: Hello!
Bot: Hello, thanks for visiting
Sean: I've never heard of Mario.
Bot: Mario has access to a variety of power-ups that give him different abilities. Mario's fraternal twin brother is Luigi.
Sean: thanks
Bot: Happy to help!
Sean: popular nintendo games?
Bot: The top 10 most popular Nintendo games are Super Smash Bros Melee, Super Metroid, Mario Kart 64, Super Mario Bros.,
The Legend Of Zelda: Breath Of The Wild, The Legend Of Zelda: A Link To The Past, Super Mario 64,
Super Mario World, The Legend Of Zelda: Ocarina Of Time, Super Mario Bros 3
Sean: What are your favorite video games?
Bot: My favorite video games to play are Detroit: Become Human, Cyberpunk 2077, and Halo!
Sean: see you later!
Bot: Bye! Come back again soon.
```

Knowledge Base:

```
{"intents": [
    {"tag": "greeting",
     "patterns": [
        "Hi",
        "Hey",
        "How are you",
        "Is anyone there?",
        "Hello",
        "Good day"
     ],
     "responses": [
        "Hey :-)",
        "Hello, thanks for visiting",
        "Hi there, what can I do for you?",
        "Hi there, how can I help?"
     ]
    },
    {"tag": "goodbye",
     "patterns": ["Bye", "See you later", "Goodbye"],
     "responses": [
        "See you later, thanks for visiting",
        "Have a nice day",
        "Bye! Come back again soon."
     ]
    },
    {"tag": "thanks",
     "patterns": ["Thanks", "Thank you", "That's helpful", "Thank's a lot!"],
     "responses": ["Happy to help!", "Any time!", "My pleasure"]
    },
```

```
{"tag": "mario",
  "patterns": [
    "What is Mario?",
    "Tell me about Mario.",
    "Give me some background information about Mario."
  ],
  "responses": [
    "Mario is a character created by Japanese video game designer Shigeru
Miyamoto. He is the title character of the Mario franchise and the mascot of
Japanese video game company Nintendo. Mario has appeared in over 200 video games
since his creation.",
    "Mario has appeared in over 200 video games since his creation. Depicted
as a short, pudgy, Italian plumber who resides in the Mushroom Kingdom, his
adventures generally center on rescuing Princess Peach from the Koopa villain
Bowser.",
    "Mario has access to a variety of power-ups that give him different
abilities. Mario's fraternal twin brother is Luigi."
  ]
},
{"tag": "nintendo",
  "patterns": [
    "What are the top 10 most popular Nintendo games?",
    "What is considered the best Nintendo games of all time?",
    "Can you list some popular Nintendo games ever made?"
  ],
  "responses": [
    "The top 10 most popular Nintendo games are Super Smash Bros Melee, Super
Metroid, Mario Kart 64, Super Mario Bros., The Legend Of Zelda: Breath Of The
Wild, The Legend Of Zelda: A Link To The Past, Super Mario 64, Super Mario World,
The Legend Of Zelda: Ocarina Of Time, Super Mario Bros 3"
  ]
},
{"tag": "video game",
  "patterns": [
    "What is your favorite video game?",
    "Are there any video games you like to play?"
  ],
  "responses": [
    "My favorite video games to play are Detroit: Become Human, Cyberpunk
2077, and Halo!"
  ]
  }
 ]
}
```

Strengths and Weaknesses:

Strength:	Weakness:
Responsive and answers back	Minimum user model
Accuracy of answers of above .90	Can't sympathize with user
Can talk about the domain knowledge very well	Word choice is important for getting the right response from the chatbot