

Edward: The Part-Time Chatbot

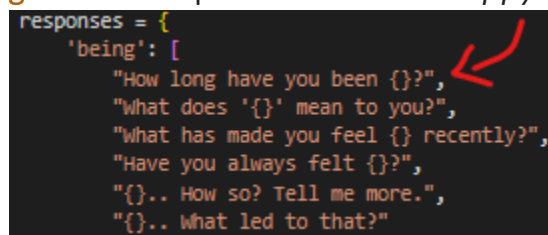
The chatbot uses the `regex` module to match patterns in whatever the user inputs, then responds with the predefined statements the user has placed beforehand. It categorizes inputs based on the patterns like:

- `pttrn_being`: "I am happy";
- `pttrn_being_negation`: "I am not sad";
- `pttrn_my_family`: "My dad was a biker";
- `pttrn_my_general`: "My ego got absolutely shattered".

Each of these categories has its set of 2-3 responses, and the chatbot checks for matches sequentially to appropriately choose which response to use.

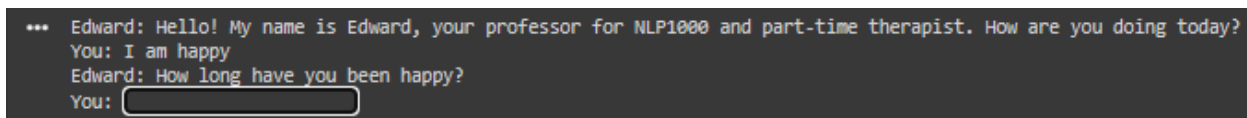
With that being said, the patterns provided to us successfully capture their respective categories. For example:

The pattern `pttrn_being` can detect phrases like "I am happy" or "I'm excited".



```
responses = {
  'being': [
    "How long have you been {}?",
    "What does '{}' mean to you?",
    "What has made you feel {} recently?",
    "Have you always felt {}?",
    "{}.. How so? Tell me more.",
    "{}.. What led to that?"
  ]
}
```

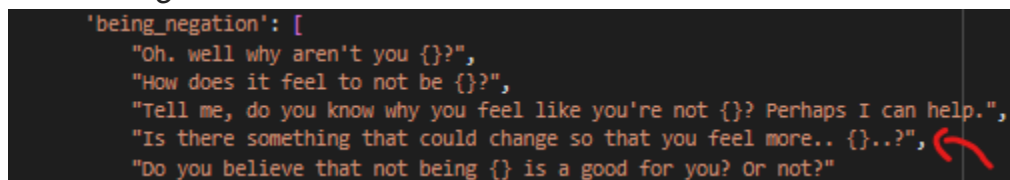
Figure 1.1 (Responses - 'being')



```
... Edward: Hello! My name is Edward, your professor for NLP1000 and part-time therapist. How are you doing today?
You: I am happy
Edward: How long have you been happy?
You: 
```

Figure 2.1 (Chatting - 'being')

And the pattern `pttrn_being_negation` effectively matches statements like "I am not sad" or "I am not sigma".



```
'being_negation': [
  "Oh. well why aren't you {}?",
  "How does it feel to not be {}?",
  "Tell me, do you know why you feel like you're not {}? Perhaps I can help.",
  "Is there something that could change so that you feel more.. {}..?",
  "Do you believe that not being {} is a good for you? Or not?"
]
```

Figure 1.2 (Responses - 'being_negation')

```
*** Edward: Hello! My name is Edward, your professor for NLP1000 and part-time therapist. How are you doing today?  
You: I am not sad  
Edward: Is there something that could change so that you feel more.. sad..?  
You: 
```

Figure 2.2 (Chatting - 'being_negation')

Although, there are still limitations when user inputs deviate from the expected format given to us. For example, variations like *"I don't feel sigma alpha male enough"* or *"I've been feeling a little down recently"* may not match what the user believes it'll match due to their different and somewhat complex structures (well it's complex to the current chatbot), highlighting the inflexibility of the current pattern matching. Let's take a look at an example:

```
*** Edward: Hello! My name is Edward, your professor for NLP1000 and part-time therapist. How are you doing today?  
You: I don't feel sigma alpha male enough  
Edward: How does that make you feel?  
You: I've been feeling a little down recently  
Edward: What does that mean to you?  
You: 
```

Figure 2.3 (Chatting - Rigid Pattern Matching)

Strengths & Weaknesses?

- **Strengths:**

- **Excellent Pattern Responsiveness:** The chatbot is highly responsive to specific patterns, allowing it to provide targeted responses that feel relevant to user inputs. As stated earlier, Patterns like `pttrn_being` and `pttrn_being_negation` can successfully capture the user's inputs such as *"I am happy"* and *"I am not sad"* respectively. This will also allow the chatbot to reply with contextually relevant responses to either pattern.
- **Targeted Response:** The chatbot matches inputs to distinct categories, it can deliver responses that are tailored to the user's emotional state or relationships. For example, when the chatbot recognizes that a user mentions a family member like *"my dad"*, it can initiate a dialogue about family dynamics, which makes the interaction feel more thoughtful.

- **Weaknesses:**

- **Difficulty Handling Complex Inputs:** When the user inputs contain multiple patterns/categories involved, the chatbot will not process them effectively. For example, if a user says, *"I am not sigma with my brother"*, the bot can only match one category at a time—either the emotional sigma state or the family reference. This limitation results in responses that feel incomplete.
- **Limited Flexibility in Understanding:** The inability to handle variations in phrasing is another weakness. While it successfully captures *"I am not sad"*, it may miss out on variations like *"I don't feel sigma skibidi toilet"* or *"I*

haven't been an alpha sigma male enough lately". These subtle differences in how users express themselves will cause the chatbot to literally ignore relevant inputs entirely. Since we humans naturally vary our phrasing, the system's reliance on exact matches restricts its effectiveness in real-world conversations, especially with Gen Z slang.

```
'generic': [
    "Can you tell me more about that?",
    "How does that make you feel?",
    "What does that mean to you?",
    "Very interesting, please elaborate further."
```

Figure 1.3 (Responses - 'generic')

```
*** Edward: Hello! My name is Edward, your professor for NLP1000 and part-time therapist. How are you doing today?
You: I don't feel sigma skibidi toilet
Edward: How does that make you feel?
You: I haven't been an alpha sigma male enough lately
Edward: Can you tell me more about that?
You: 
```

Figure 2.4 (Chatting - not very skibidi :<)

A part of the expected weakness this chatbot has is the fact that it was designed to be **"too simple"**. There, the challenge comes with integrating matches into responses for specific categories because the responses need to be coherent and meaningful based on the captured pattern. For example, a sentence like:

→ *"I am not happy with the idea that my mom won't allow me to buy a Kawasaki Ninja 400, 399 cc (24.3 cu in) liquid-cooled 4-stroke 8-valve DOHC parallel-twin, 14 L (3.1 imp gal; 3.7 US gal)"*

involves both `pttrn_being_negation` and `pttrn_my_family`, but the Edward Chatbot, as programmed, can only respond to one pattern at a time. Integrating both patterns into a single, coherent response would require more advanced logic and could complicate the system, which unfortunately or fortunately— is not implemented in this Mini Project.

```
'being_negation': [
    "Oh. well why aren't you {}?",
    "How does it feel to not be {}?",
    "Tell me, do you know why you feel like you're not {}? Perhaps I can help.",
    "Is there something that could change so that you feel more.. {}..?",
    "Do you believe that not being {} is a good for you? Or not?"
],
'family': [
    "Tell me more about your relationship with your {}.",
    "Hmm, how do you think {} influence's your life?",
    "I hope you don't mind answering but, are you close with your {}?",
    "What role does your {} play in your life?",
    "Do you love your {}?"
]
```

Figure 1.4 (Responses - 'being_negation' & 'family')

```
Edward: Hello! My name is Edward, your professor for NLP1000 and part-time therapist. How are you doing today?
You: I am not happy with the idea that my mom won't allow me to buy a Kawasaki Ninja 400, 399 cc (24.3 cu in) liquid-cooled 4-stroke 8-valve DOHC parallel-twin, 14 L (3.1 imp gal; 3.7 US gal)
Edward: Tell me, do you know why you feel like you're not happy with the idea that my mom won't allow me to buy a Kawasaki Ninja 400? Perhaps I can help.
You: 
```

Figure 2.5 (Chatting - 2 categories at a time)

I am unsure if I heard this during class, or maybe not– but a primary limitation to RegEx-Based Chatbots is their lack of true understanding. Yes, chatbots can recognize and respond to patterns accordingly, but it does not comprehend the meaning behind the words itself. An example of this is that the chatbot cannot tell the difference if the user states “I am happy” genuinely or sarcastically, and will always treat the input at face value. I would also like to repeat that RegEx patterns are fragile or delicate, in a sense that it’ll fail to match if the input slightly deviates from the expected pattern.

Well, one of the main observations was the challenge in handling session termination gracefully. The `pattern_stop_session` needs to capture various ways a user might indicate they want to stop, like:

- “stop”
- “Let's stop”
- “let us stop”

Ensuring the chatbot provides an appropriate response that acknowledges the user's wish to stop. I would lastly like to add that it is important for the bot to give the user a courteous and appropriate response that acknowledges the user's wish to stop, while also offering another session if the user would like one in the near future.

To be fair, a therapist shouldn't produce responses that feel formulaic, emotionally tone-deaf, or worse– make our therapist seem robotic– because who would want to have a robot therapist? Isn't the whole point of speaking to a therapist, to gain advice from someone who can emotionally understand how we feel? Right? Right...?

Potential Improvements and New Categories

First potential improvement that comes to mind regarding the Edward Chatbot is to consider enhancing its ability to handle inputs containing **multiple categories**, such as combining `pttrn_being_negation` and `pttrn_my_family` in the same response. For example, if a user says: "I am not happy with my brother", the chatbot should respond in a way that addresses both the negative emotional state and the family relationship with their brother.

Another helpful category may be "emotional intensity" to capture statements like "I am tremendously upset" or "I am somewhat displeased." This would allow the chatbot to respond with a more sophisticated understanding of the user's emotional state. Although I have a feeling we'd do something like this in the future MPs.

My Reflections and Learnings

I learned how precise patterns need to be to capture specific inputs, apparently RegEx offers a powerful tool for text matching, but struggles with the delicacy of natural language, such as context, irony, sarcasm, gen z humor, and many more. It was a good exercise for a beginner like me, with little to no experience in NLP.

To be fair, theoretically, a RegEx-based chatbot doesn't "understand" the user in any meaningful sense. It simply processes inputs based on predefined rules without a solid comprehension of context or intent, hence it being a TOP-DOWN approach from the slides provided to us. The chatbot can only mimic some aspects of human interaction, and as it is simple— similar to Eliza. It lacks the adaptive learning characteristic of a more advanced artificial intelligence system.