

CMPE 187 Sec-02
Deliverable #2: AI Test Modeling
Application: Replika Chatbot

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Section 1. AI Function Test Requirement Analysis

1.1 Chatbot Information

Replika is an intelligent chatbot software application. To be able to become a user's friend the Replika AI through the conversation with users to understand and analyze the user's emotions and needs. Replika isn't just a companion, it can also track the user's mood and understand their thoughts/feelings with daily conversations. This bot learns on the go about the user. Replika was founded by Eugenia Kuyda with the idea to create a personal AI that would help you express and witness yourself by offering a helpful conversation.

1.2 AI Function Test Requirements

We will be testing four functional test parameters: domain knowledge , language, question and answer, and memory.

Test Parameter	Group Member (Done By)
Memory	Paul Soriano
Domain Knowledge	Anna Li
Language	Xiran Jia
Q&A	Victor Martinez

Table 1. Test Parameters

1.2.1 Domain Knowledge

Domain Knowledge is the specialized knowledge/expertise in a particular field. While Replika has general knowledge of things, it also has its own particular field that it was programmed/trained to excel in. The team will be testing Replika on its knowledge of a specific domain. We will be testing the chatbot's ability to acknowledge and answer user's input in terms of emotional contents such as happiness, anxiety, and anger. These contents will be tested according to the type of input that the user uses along with the way how the user expresses each of the emotions. The main goal is to ensure that different perspectives are covered when it comes to quality verification.

1.2.2 Language

Under normal circumstances, AI chatbots should have the flexibility to recognize and feedback various chat languages. This will include the detection of an AI chatbot in how to classify the user's language, the recognition of the user's emoji in the chat, the distinguishing of special

symbols and slang shows in the sentences and so on. This chapter will test the communication ability and understanding ability of AI chatbots in emotional content (such as happiness, anxiety and anger) under different language modes.

1.2.3 Question and Answer

Replika chatbot should be able to answer certain questions with an appropriate answer. Question and Answer testing will test the accuracy of how well the chatbot answers the question. Q&A will be going towards Replika's more general knowledge of items. The type of questions that are asked would be What/Where/Who/When questions. Questions will need to revolve around our topic, which is psychology. The question topic that is asked should receive an answer from the chatbot that's at least related to the subject. Similar questions will be asked to the chatbot to see if similar answers are given to fully test the chatbot's accuracy.

Test Requirements:

What/How

- Answer should contain an explanation/suggestion.

Where

- Answer should usually contain a location/place.

Who

- Answer should contain a person.
- Can contain multiple people.

When

- Answer should usually contain a time.
- Answer can contain a location.

1.2.4 Memory

In order to be fully called an artificial intelligence, a system must display its intelligence by its ability to retain information. The memory testing will check Replika chatbot's ability to remember previous conversations and details, as well as being able to continue a conversation that has previously happened. The types of questions that can be asked to the chatbot have to include logically-related questions. In addition to these types of questions, the Replika chatbot will also be asked follow-up questions to show that it retains memory of previous conversations.

1.3 AI Function Test Requirement Modeling

Topic	Type	Input	Expected Result
1. Happiness	1.1 Joy	User expresses joy	Subject acknowledges user is enjoying
	1.2 Excitement	User expresses excitement	Subject acknowledges user is excited
	1.3 Love	User expresses love	Subject acknowledges user is in love
	1.4 Gratitude	User expresses gratitude	Subject acknowledges user is thankful
2. Anxiety	2.1 Phobias	User expresses phobias	Subject acknowledges user has phobias
	2.2 Social Anxiety Disorder	User expresses social anxiety	Subject acknowledges user has social anxiety
	2.3 Generalized Anxiety	User expresses generalized anxiety	Subject acknowledges user has generalized anxiety
3. Anger	3.1 Behavioral Anger	User expresses behavioral anger	Subject acknowledges user has behavioral anger
	3.2 Assertive Anger	User expresses assertive anger	Subject acknowledges user has assertive anger
	3.3 Self-abuse Anger	User expresses self-abuse anger	Subject acknowledges user has self-abuse anger

Table 1. Domain Knowledge Test Requirements Modeling

Topic	Type	Input	Expected Result
1. Happiness	English Language	User expresses happiness in English	Subject acknowledges the user's English in happiness mode.
	Chinese Language	User expresses happiness in Chinese	Subject acknowledges the user's Chinese in happiness mode.
	Spanish Language	User expresses happiness in Spanish	Subject acknowledges the user's Spanish in happiness mode.

	Slang	User expresses happiness in slang	Subject acknowledges the user's slang in happiness mode.
	Emojis	User expresses happiness in emojis	Subject acknowledges the user's emojis in happiness mode.
	Incorrect Grammar	User expresses happiness in incorrect grammar	Subject acknowledges the user's incorrect grammar in happiness mode.
	Correct Grammar	User expresses happiness in correct grammar	Subject acknowledges the user's correct grammar in happiness mode.
2. Anxiety	English Language	User expresses anxiety in English	Subject acknowledges the user's English in anxiety mode.
	Chinese Language	User expresses anxiety in Chinese	Subject acknowledges the user's Chinese in anxiety mode.
	Spanish Language	User expresses anxiety in Spanish	Subject acknowledges the user's Spanish in anxiety mode.
	Slang	User expresses anxiety in slang	Subject acknowledges the user's slang in anxiety mode.
	Emojis	User expresses anxiety in emojis	Subject acknowledges the user's emojis in anxiety mode.
	Incorrect Grammar	User expresses anxiety in incorrect grammar	Subject acknowledges the user's incorrect grammar in anxiety mode.
	Correct Grammar	User expresses anxiety in correct grammar	Subject acknowledges the user's correct grammar in anxiety mode.
3. Anger	English Language	User expresses anger in English	Subject acknowledges the user's English in anger mode.
	Chinese Language	User expresses anger in Chinese	Subject acknowledges the user's Chinese in anger mode.
	Spanish Language	User expresses anger in Spanish	Subject acknowledges the user's Spanish in anger mode.
	Slang	User expresses anger in slang	Subject acknowledges the user's slang in anger mode.

	Emojis	User expresses anger in emojis	Subject acknowledges the user's emojis in anger mode.
	Incorrect Grammar	User expresses anger in incorrect grammar	Subject acknowledges the user's incorrect grammar in anger mode.
	Correct Grammar	User expresses anger in correct grammar	Subject acknowledges the user's correct grammar in anger mode.

Table 2. Language Test Requirements Modeling

Topic	Question	Expected Answer
Psychology	What do you think of Psychology? Who is the father of psychology? Who coined the term psychology? Who invented psychology? When was psychology invented?	Answer contains an explanation Answer contains a person Answer contains a explanation Answer contains the same person Answer should contain a time
Mental Health	Where can I get help for my mental health? How can I improve my mental health?	Answer contains a location/explanation Answer contains a explanation
Happiness	What causes happiness? What should I do to become more happy?	Answer contains an explanation Answer contains an explanation
Anger	Where can I go to get anger management? What are different ways anger is expressed? When was the last time you got angry?	Answer contains a location Answer contains an explanation Answer contains a time

Anxiety	What are ways to calm my anxiety? When does anxiety usually happen?	Answer contains an explanation Answer contains a time
Phobias	What's the most common phobia?	Answer contains an explanation

Table 3. Q&A Test Requirements

Topic	Type	Input	Expected Result
1. Happiness	Initial Question	User asks what happiness is	Subject responds with what happiness is
	Follow-up Question	User asks if user has asked the chatbot what happiness is	Subject confirms that the question has been asked.
	Second Question	User asks what excitement is	Subject responds with what excitement is
	Comparison Question	User asks how excitement differs from happiness	Subject responds with comparison of happiness and excitement
	Memory Question	User asks if user has asked the chatbot what excitement is	Subject confirms that the question has been asked.
2. Anxiety	Initial Question	User asks what anxiety is	Subject responds with what anxiety is
	Follow-up Question	User asks if user has asked the chatbot what anxiety is	Subject confirms that the question has been asked.
	Second Question	User asks what nervousness is	Subject responds with what nervousness is
	Comparison Question	User asks how anxiety differs from nervousness	Subject responds with comparison of anxiety and nervousness
	Memory Question	User asks if user has asked the chatbot what nervousness is	Subject confirms that the question has been asked.

3. Anger	Initial Question	User asks what anger is	Subject responds with what anger is
	Follow-up Question	User asks if user has asked the chatbot what anger is	Subject confirms that the question has been asked.
	Second Question	User asks what jealousy is	Subject responds with what jealousy is
	Comparison Question	User asks how anger differs from jealousy	Subject responds with comparison of anger and jealousy
	Follow-up Question	User asks if user has asked the chatbot what jealousy is	Subject confirms that the question has been asked.

Table 4. Memory Test Requirements

Section 2 – AI Test Modeling for Selected AI Features

2.1. Context modeling for each selected AI-powered function/feature

2.1.1 Domain Knowledge

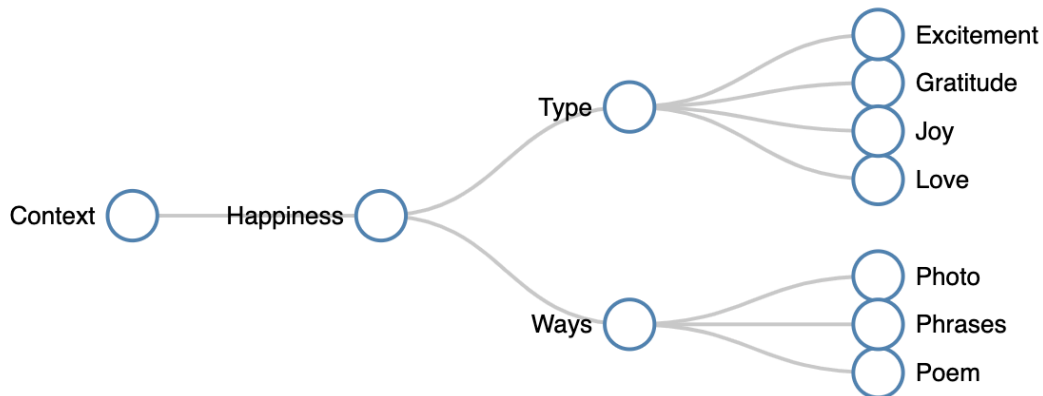


Figure 1. The Context Classification Tree For Domain Knowledge Function (Happiness)

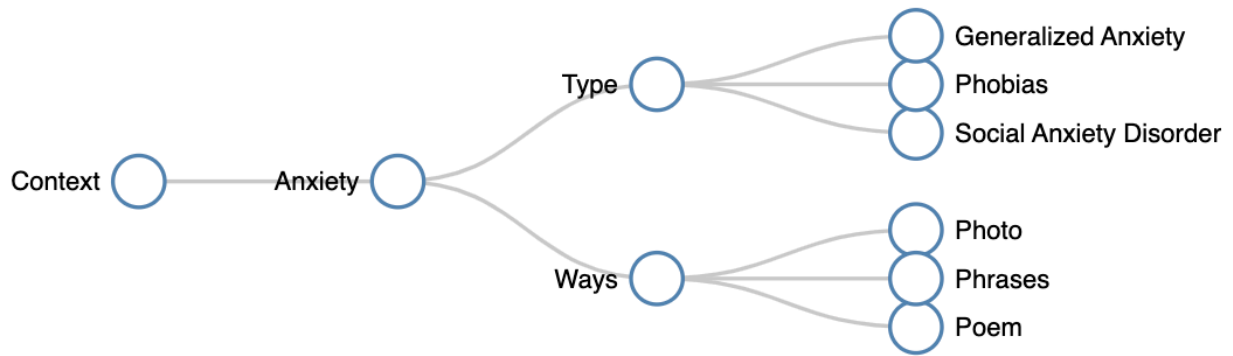


Figure 2. The Context Classification Tree For Domain Knowledge Function (Anxiety)

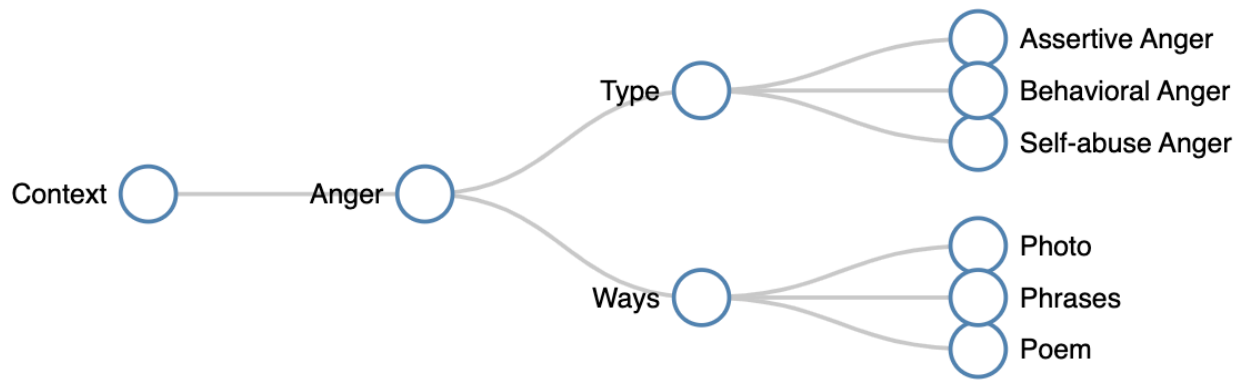


Figure 3. The Context Classification Tree For Domain Knowledge Function (Anger)

2.1.2 Language

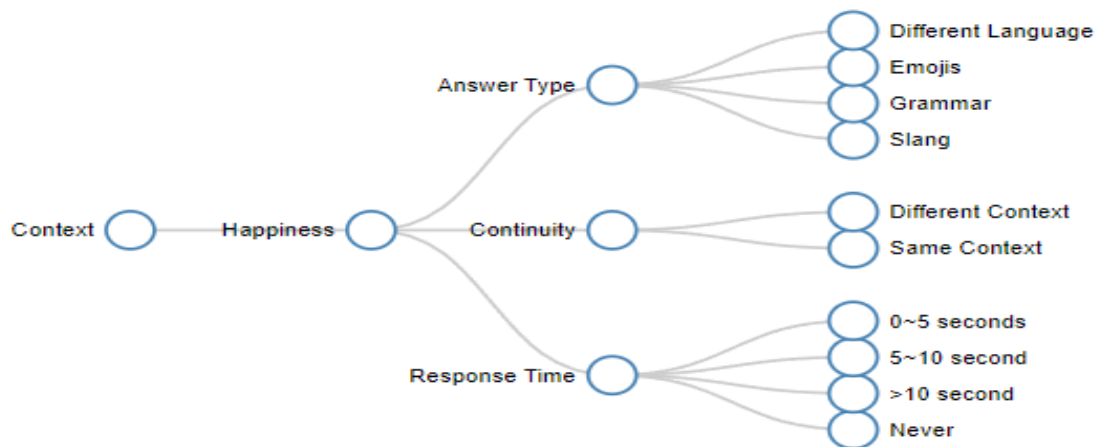


Figure 4. The Context Classification Tree for Language Function (Happiness)

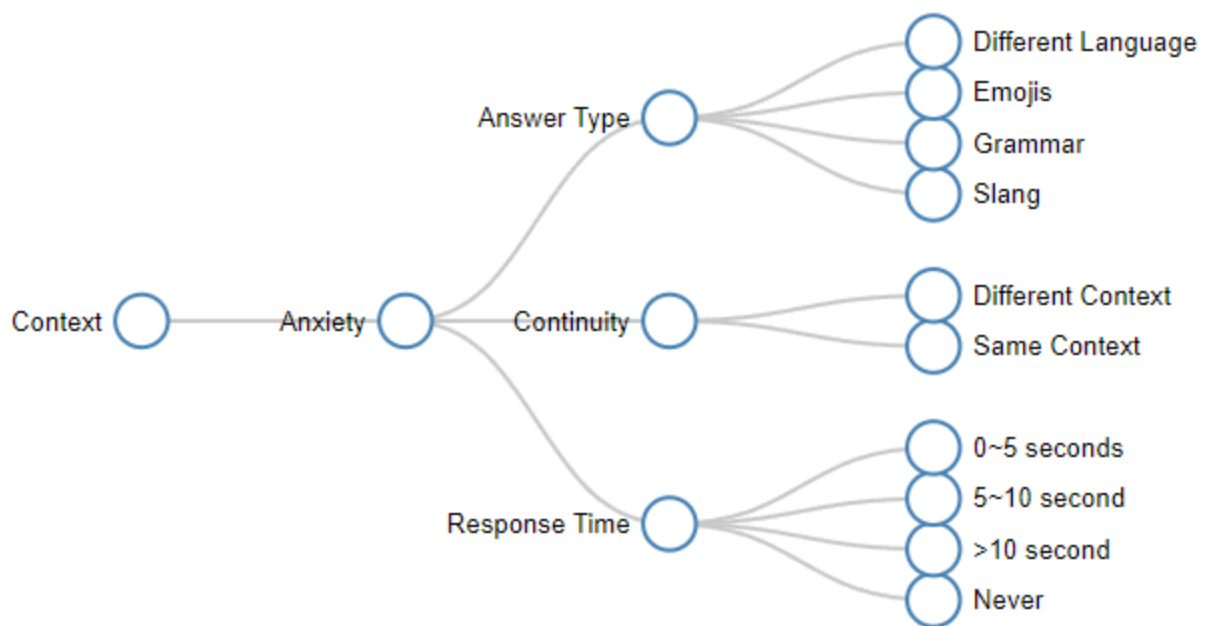


Figure 5. The Context Classification Tree for Language Function (Anxiety)

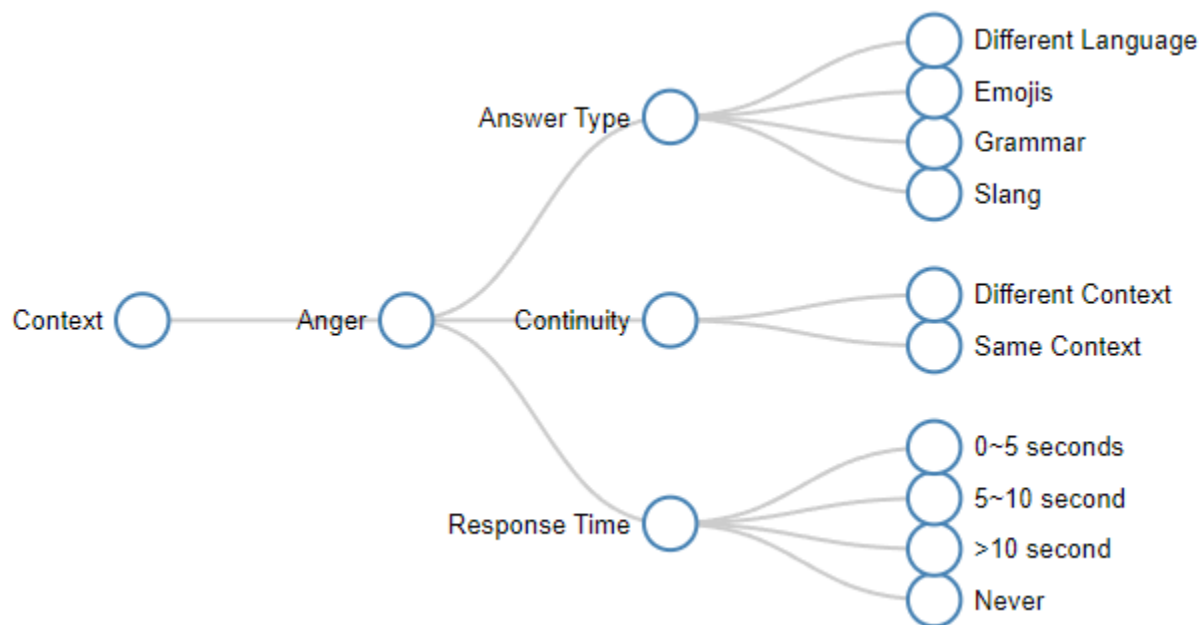


Figure 6. The Context Classification Tree for Language Function (Anger)

2.1.3 Question and Answer

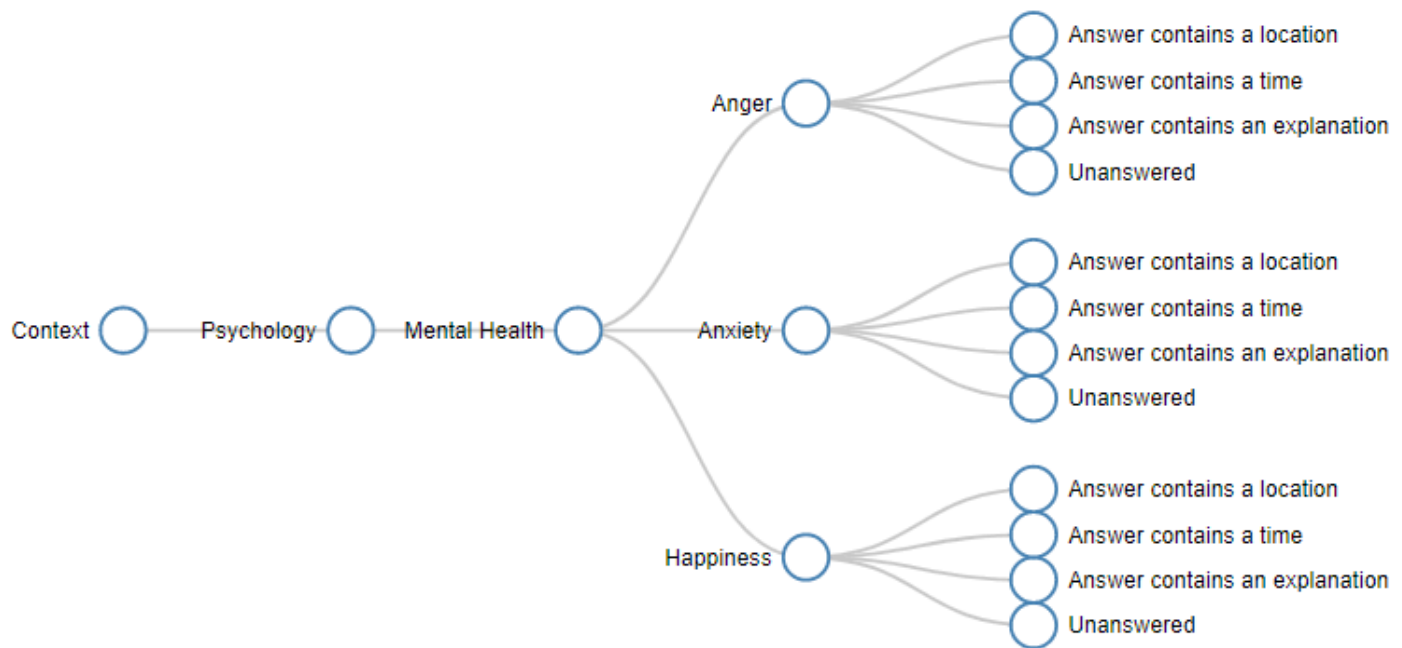


Figure 7. The Context Classification Tree for Question and Answer

2.1.4 Memory

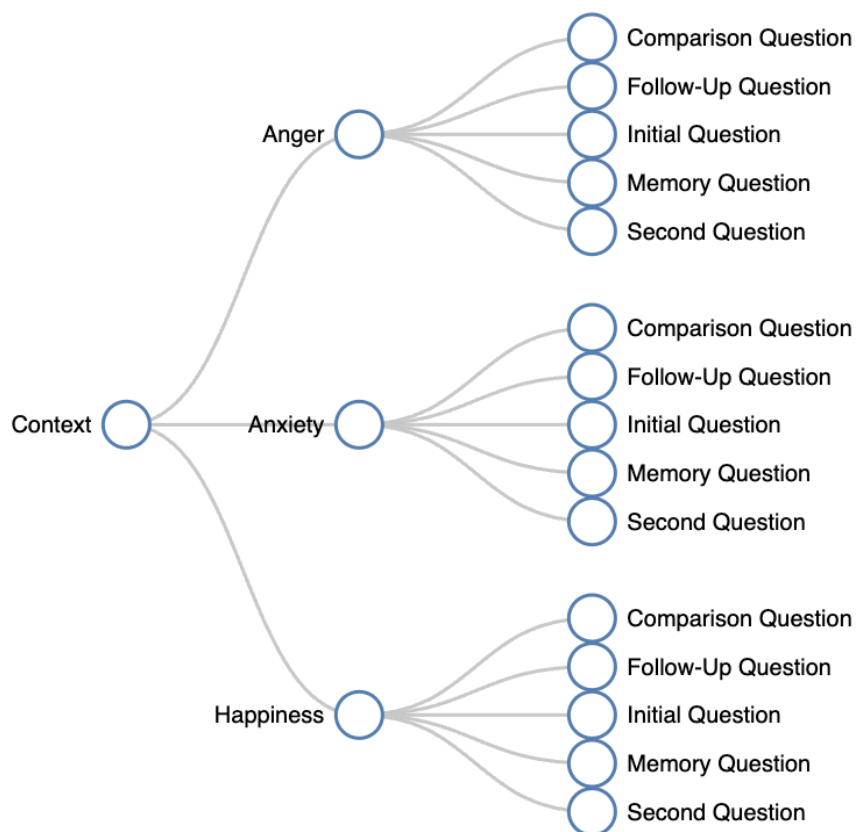


Figure 8. The Context Classification Tree for Memory

2.2. AI-powered Function Input Classifications

2.2.1 Domain Knowledge

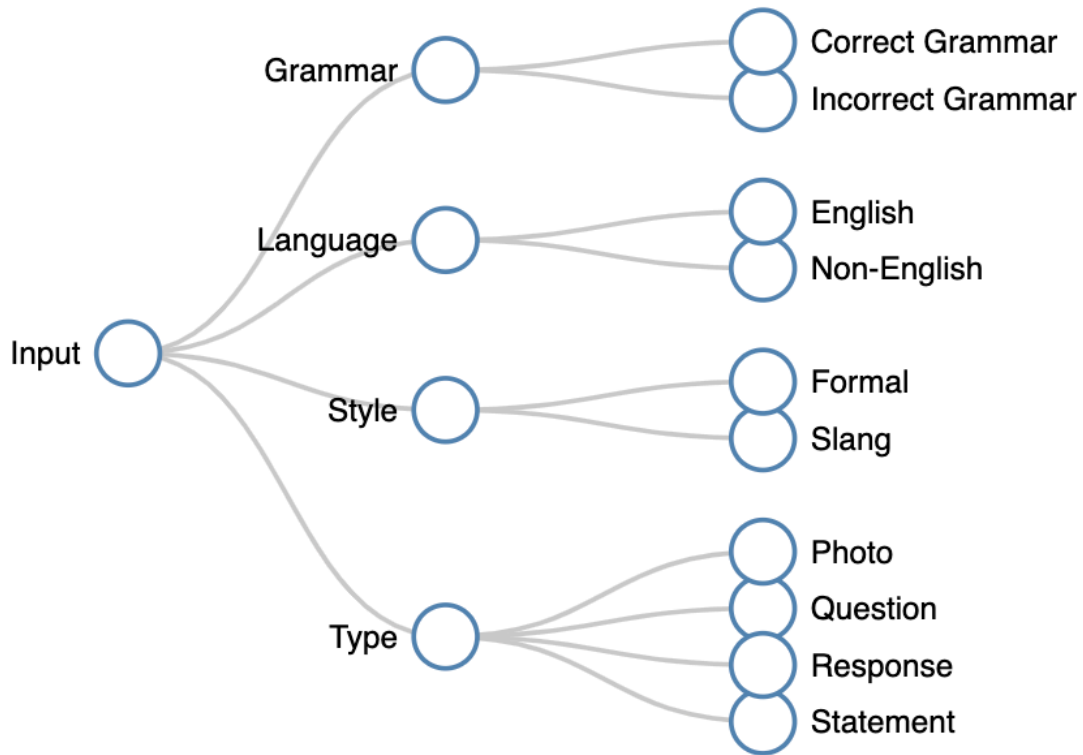


Figure 9. Domain Knowledge Classification Input Tree

2.2.2 Language

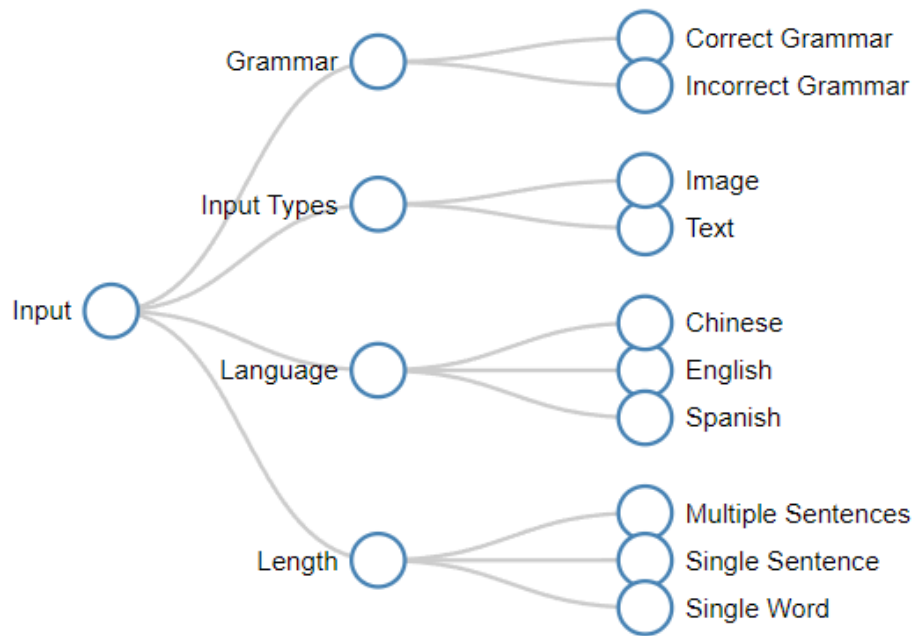


Figure 10. Language Classification Input Tree

2.2.3 Question and Answer

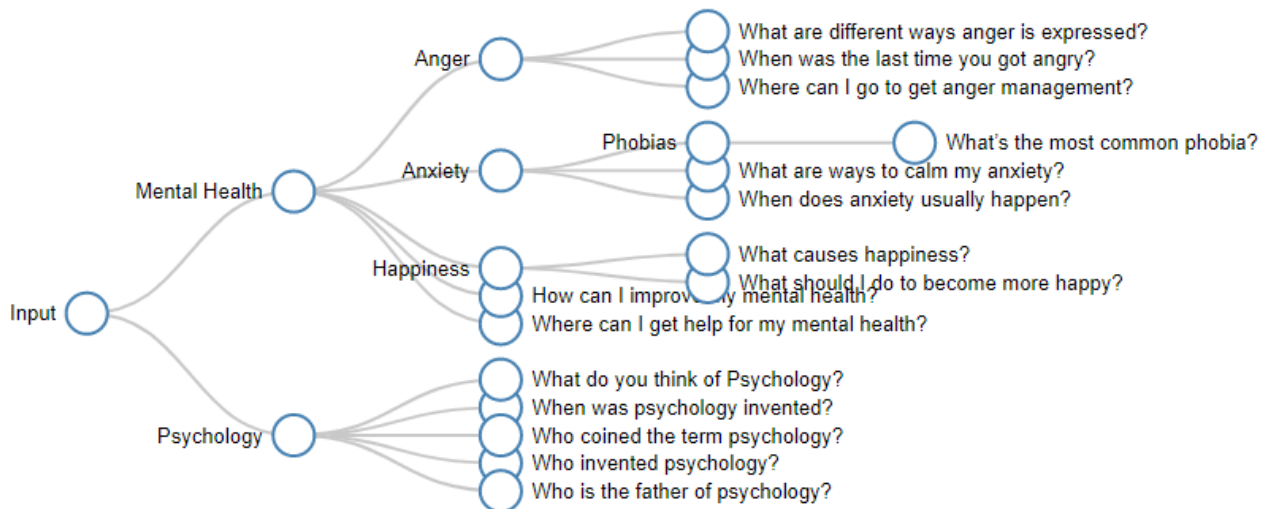


Figure 11. Q&A Classification Input Tree

2.2.4 Memory

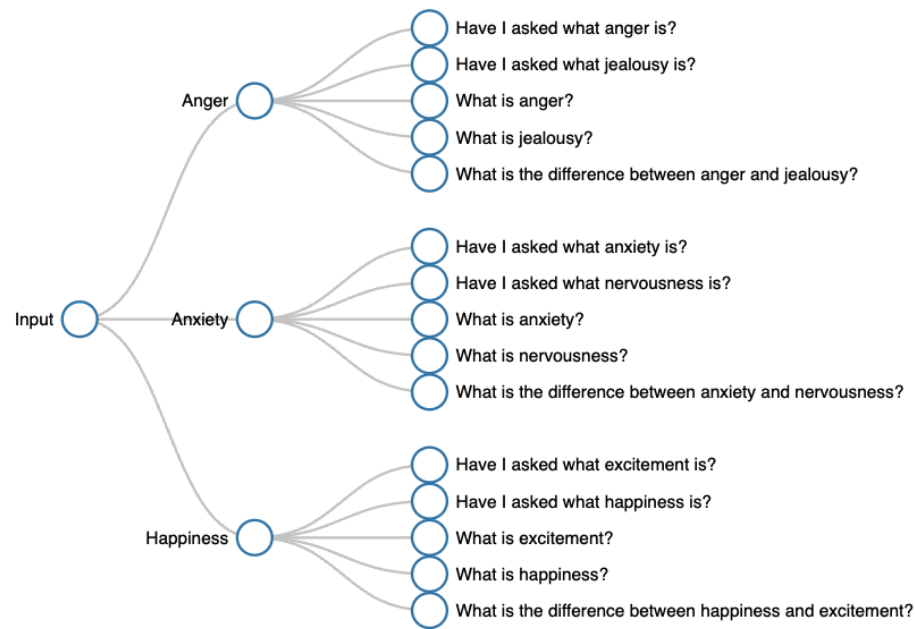


Figure 12. Memory Classification Input Tree

2.3. AI-powered function output/event/action classifications

2.3.1 Domain Knowledge

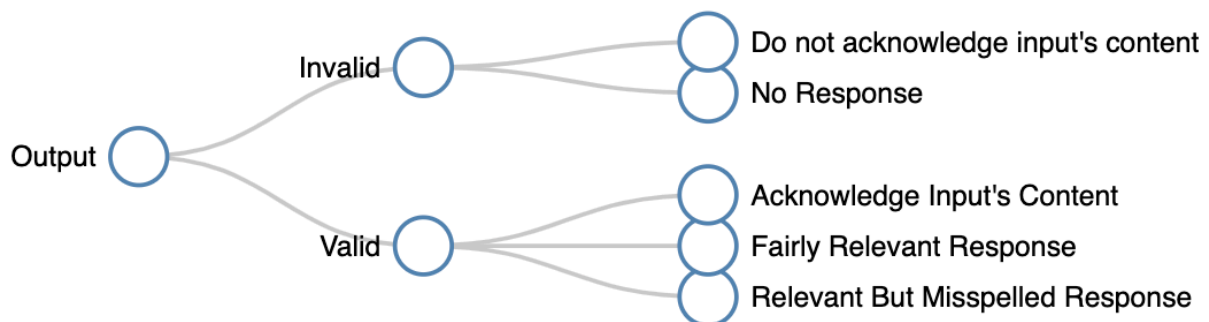


Figure 13. Domain Knowledge Classification Output Tree

2.3.2 Language

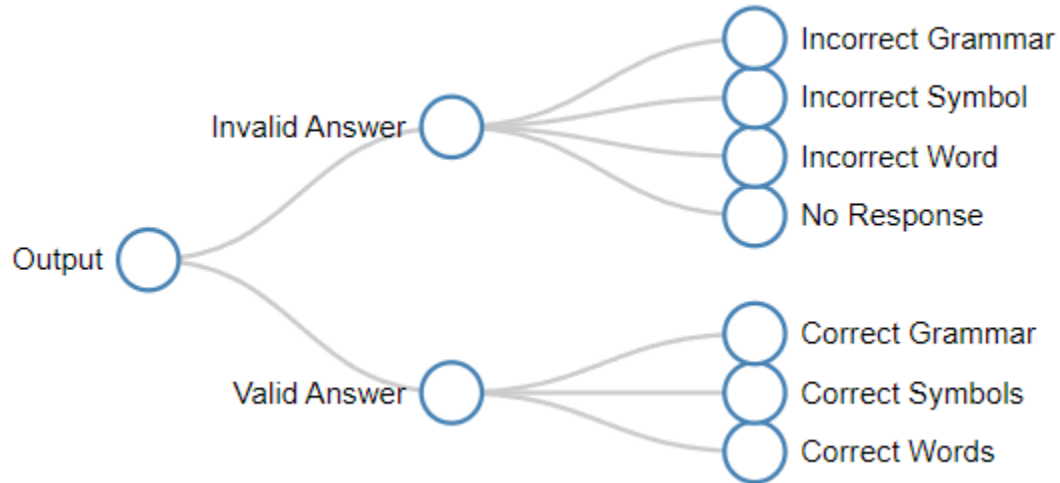


Figure 14. Language Classification Output Tree

2.3.3 Q&A

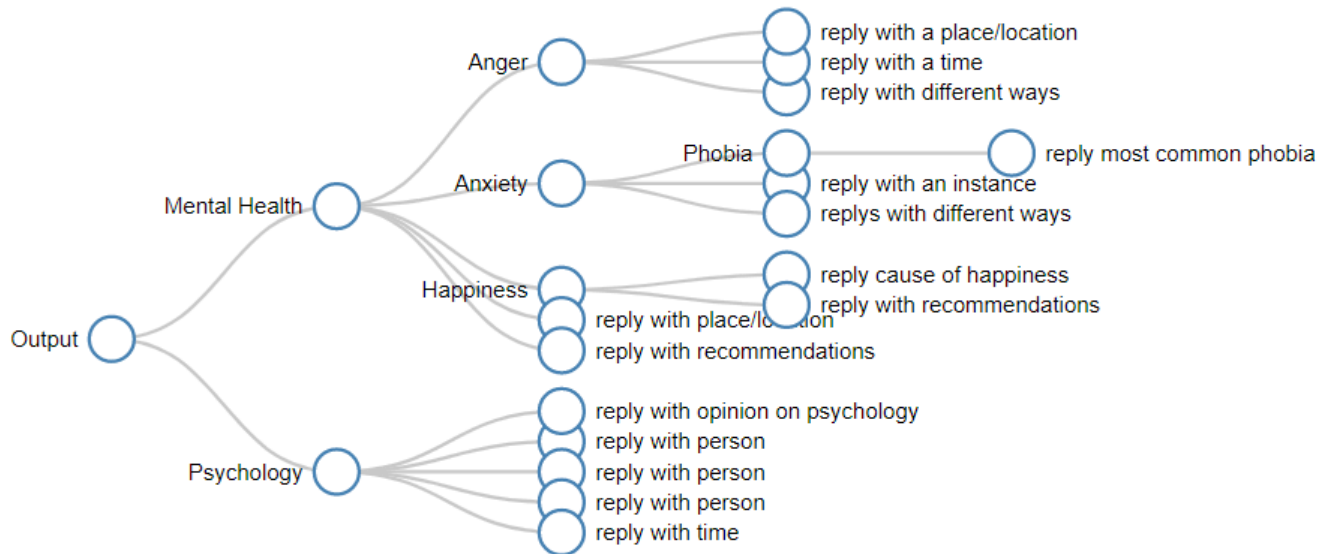


Figure 15. Q&A Classification Output Tree

2.3.1 Memory

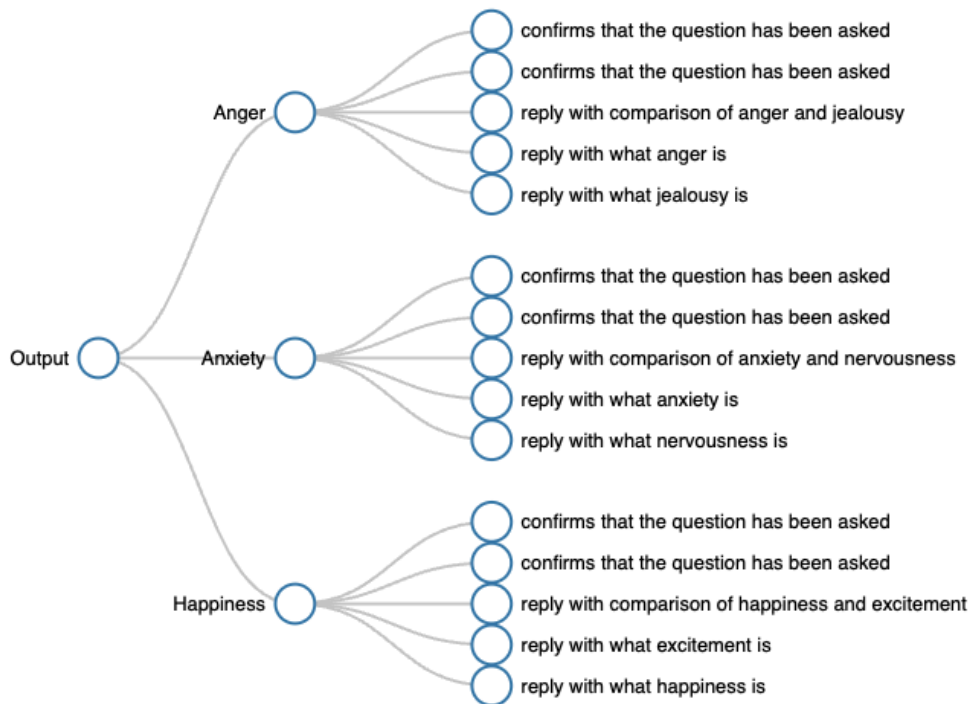


Figure 16. Memory Classification Output Tree

2.4. AI-powered function classification decision tables

2.4.1 Domain Knowledge

2.4.1.1 Context Spinning Tree

ID	Emotion	Type	Ways
C1	Happiness	Joy	Phrases
C2	Happiness	Excitement	Photo
C3	Happiness	Gratitude	Poem
C4	Happiness	Love	Phrases
C5	Anxiety	Phobias	Phrases
C6	Anxiety	Generalized Anxiety	Photo

C7	Anxiety	Social Disorder Anxiety	Poem
C8	Anger	Assertive Anger	Phrases
C9	Anger	Behavioral Anger	Poem
C10	Anger	Self-abuse Anger	Photo

2.4.1.2 Input Spinning Tree

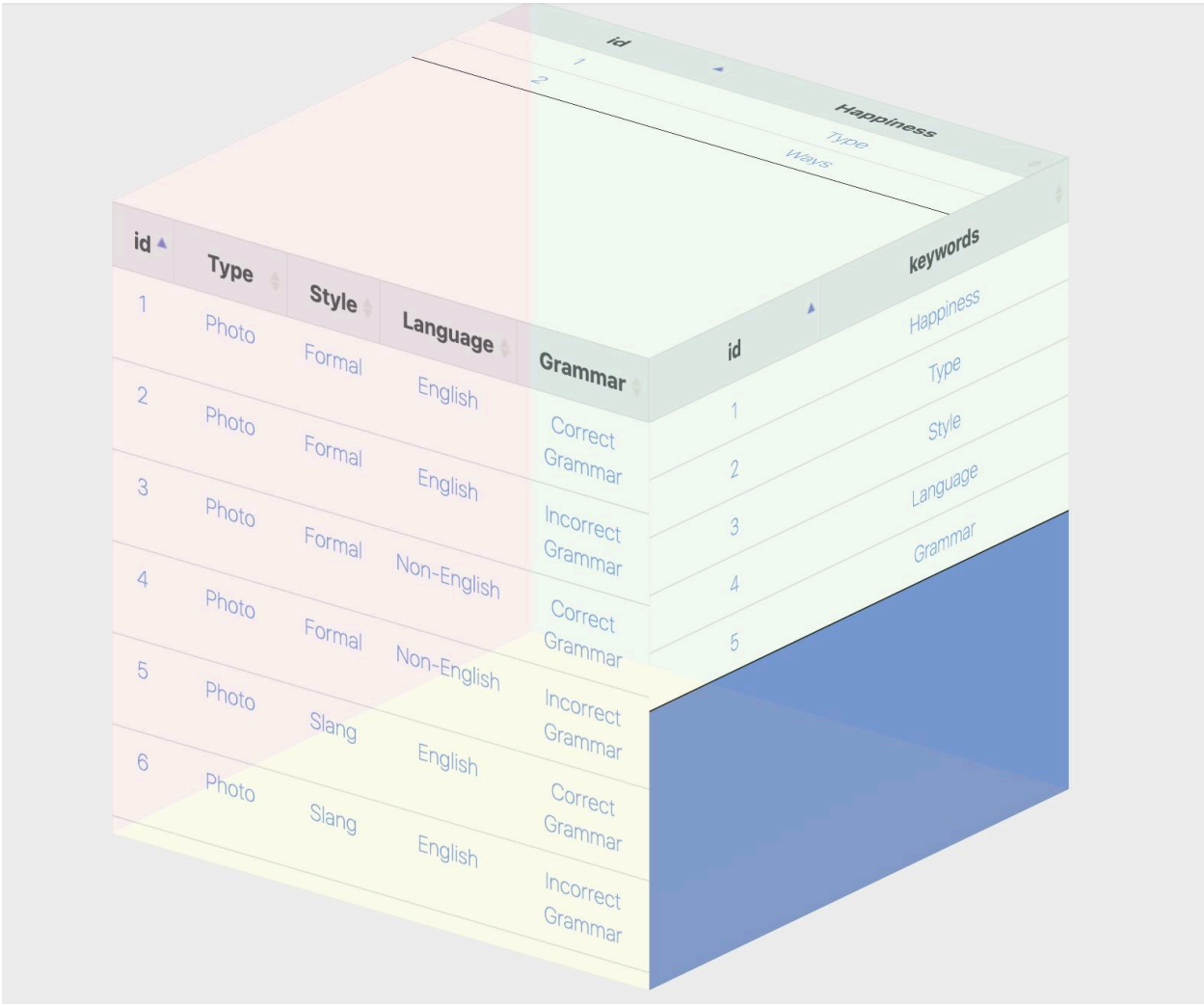
ID	Grammar	Language	Style	Type
I1	Correct Grammar	English	Formal	Question
I2	Incorrect Grammar	English	Slang	Question
I3	Correct Grammar	Non-English	Formal	Response
I4	Incorrect Grammar	Non-English	Formal	Response
I5	Correct Grammar	English	Formal	Statement
I6	Incorrect Grammar	English	Formal	Statement

2.4.1.3 Output Spinning Tree

ID	Valid	Invalid
O1	Acknowledge Input's Content	Do Not Acknowledge Input's Content
O2	Acknowledge Input's Content	No Response
O3	Fairly Relevant Response	Do Not Acknowledge Input's Content
O4	Fairly Relevant Response	No Response
O5	Relevant But Misspelled Response	Do Not Acknowledge Input's Content

O6	Relevant But Misspelled Response	No Response
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2.4.1.4 3D Decision Table for Domain Knowledge



2.4.2 Language

2.4.2.1 Context Spinning Tree

ID	Emotion	Type	Continuity	Response Time
C1	Happiness	Different Language	Different Context	0~5 seconds
C2	Happiness	Emojis	Same Context	5~10 seconds
C3	Happiness	Grammar	Different Context	>10 seconds
C4	Happiness	Slang	Same Context	Never
C5	Anxiety	Different Language	Different Context	0~5 seconds
C6	Anxiety	Emojis	Same Context	5~10 seconds
C7	Anxiety	Grammar	Different Context	>10 seconds
C8	Anxiety	Slang	Same Context	Never
C9	Anger	Different Language	Different Context	0~5 seconds
C10	Anger	Emojis	Same Context	5~10 seconds
C11	Anger	Grammar	Different Context	>10 seconds
C12	Anger	Slang	Same Context	Never

2.4.2.2 Input Spinning Tree

ID	Grammar	Input Type	Language	Length
I1	Correct Grammar	Image	English	Multiple Sentences
I2	Incorrect Grammar	Text	English	Single Sentence
I3	Correct Grammar	Image	Chinese	Single Word
I4	Incorrect Grammar	Text	Chinese	Single Sentence

I5	Correct Grammar	Image	Spanish	Single Word
I6	Incorrect Grammar	Text	Spanish	Single Sentence

2.4.2.3 Output Spinning Tree

ID	Valid	Invalid
O1	Correct Grammar	Incorrect Grammar
O2	Correct Grammar	No Response
O3	Correct Symbol	Incorrect Symbol
O4	Correct Symbol	No Response
O5	Correct Words	Incorrect Words
O6	Correct Words	No Response

2.4.2.4 3D Decision Table for Language

ID	Grammar	Input Type	Language	Length	ID	Emotion	Type	Continuity	Response Time
I1	Correct Grammar	Image	English	Multiple Sentences	C1	Happiness	Different Language	Different Context	0-5 seconds
I2	Incorrect Grammar	Image	English	Multiple Sentences	C2	Happiness	Emojis	Same Context	5-10 seconds
I3	Correct Grammar	Text	English	Single Sentence	C3	Happiness	Grammar	Different Context	>10 seconds
I4	Incorrect Grammar	Image	Chinese	Single Sentence	C4	Happiness	Slang	Same Context	0-5 seconds
I5	Correct Grammar	Text	Chinese	Single Word	C5	Happiness	Different Language	Different Context	5-10 seconds
I6	Incorrect Grammar	Image	Spanish	Single Sentence	C6	Anxiety	Emojis	Same Context	>10 seconds
			Spanish	Single Sentence	C7	Anxiety	Grammar	Different Context	0-5 seconds
				Single Word	C8	Anxiety	Slang	Same Context	5-10 seconds
				Single Sentence	C9	Anger	Different Language	Different Context	>10 seconds
					C10	Anger	Emojis	Same Context	0-5 seconds
					C11	Anger	Grammar	Different Context	5-10 seconds
					C12	Anger	Slang	Same Context	Never

2.4.3 Question and Answer

2.4.3.1 Context Spinning Tree

ID	Emotion	Answer Type
C1	Happiness	Answer contains a location
C2	Happiness	Answer contains a time
C3	Happiness	Answer contains an explanation
C4	Happiness	Unanswered
C5	Anger	Answer contains a location
C6	Anger	Answer contains a time
C7	Anger	Answer contains an explanation

C8	Anger	Unanswered
C9	Anxiety	Answer contains a location
C10	Anxiety	Answer contains a time
C11	Anxiety	Answer contains an explanation
C12	Anxiety	Unanswered

2.4.3.2 Input Spinning Tree

ID	Topic	Question Type
I1	Psychology	What/How
I2	Psychology	Who
I3	Psychology	When
I4	Psychology	Where
I5	Mental Health	What/How
I6	Mental Health	Who
I7	Mental Health	When
I8	Mental Health	Where
I9	Happiness	What/How
I10	Happiness	Who
I12	Happiness	When
I13	Happiness	Where
I14	Anger	What/How
I15	Anger	Who
I16	Anger	When
I17	Anger	Where
I18	Anxiety	What/How

I19	Anxiety	Who
I20	Anxiety	When
I21	Anxiety	Where
I22	Phobias	What/How
I23	Phobias	What
I24	Phobias	When
I25	Phobias	Where

2.4.3.3 Output Spinning Tree

ID	Valid	Invalid
O1	Right Answer	Wrong Answer
O2	Right Answer	Gives relevant context to the answer but not the answer
O3	Right Answer	No response
O4	Right Answer but is misspelled.	Wrong Answer
O5	Right Answer but is misspelled.	Gives relevant context to the answer but not the answer
O6	Right Answer but is misspelled.	No Response
O7	Right answer but incorrect grammar	Wrong Answer
O8	Right answer but incorrect grammar	Gives relevant context to the answer but not the answer
O9	Right answer but incorrect grammar	No Response

2.4.3.4 3D Decision Table for Q&A

ID	Valid	Invalid	add. questions	Emotion	Answer Type
C1	Right Answer	Wrong Answer		Happiness	Answer contains a location
C2	Right Answer	Gives relevant context to the answer but not the answer		Happiness	Answer contains a time
C3	Right Answer	No response		Happiness	Answer contains an explanation
C4	Right Answer	Wrong Answer		Happiness	Unanswered
C5	Right Answer but is misspelled.	Gives relevant context to the answer but not the answer		Anger	Answer contains a location
C6	Right Answer but is misspelled.	No response		Anger	Answer contains a time
C7	Right Answer but is misspelled.	Wrong Answer		Anger	Answer contains an explanation
C8	Right answer but incorrect grammar	Gives relevant context to the answer but not the answer		Anger	Unanswered
C9	Right answer but incorrect grammar	No Response		Anxiety	Answer contains a location
C10	Right answer but incorrect grammar	Wrong Answer		Anxiety	Answer contains a time
C11	Right answer but incorrect grammar	Gives relevant context to the answer but not the answer		Anxiety	Answer contains an explanation
C12	Right answer but incorrect grammar	No Response		Anxiety	Unanswered

2.4.4 Memory

2.4.4.1 Context Spinning Tree

ID	Emotion	Type	Answer Type
C1	Happiness	Initial Question	Answer contains “happiness is”
C2	Happiness	Follow-Up Question	Yes/No
C3	Happiness	Second Question	Answer contains “excitement is”
C4	Happiness	Comparison Question	Answer contains “happiness” and “excitement”
C5	Happiness	Memory Question	Yes/No

C6	Anxiety	Initial Question	Answer contains “anxiety is”
C7	Anxiety	Follow-Up Question	Yes/No
C8	Anxiety	Second Question	Answer contains “nervousness is”
C9	Anxiety	Comparison Question	Answer contains “anxiety” and “nervousness”
C10	Anxiety	Memory Question	Yes/No
C11	Anger	Initial Question	Answer contains “anger is”
C12	Anger	Follow-Up Question	Yes/No
C13	Anger	Second Question	Answer contains “jealousy is”
C14	Anger	Comparison Question	Answer contains “anger” and “jealous”
C15	Anger	Memory Question	Yes/No

2.4.4.2 Input Spinning Tree

ID	Topic	Question Type
I1	Happiness	What
I2	Happiness	Yes/No
I3	Happiness	What
I4	Happiness	What/How
I5	Happiness	Yes/No
I6	Anxiety	What

I7	Anxiety	Yes/No
I8	Anxiety	What
I9	Anxiety	What/How
I10	Anxiety	Yes/No
I11	Anxiety	What
I12	Anger	Yes/No
I13	Anger	What
I14	Anger	What/How
I15	Anger	Yes/No

2.4.4.3 Output Spinning Tree

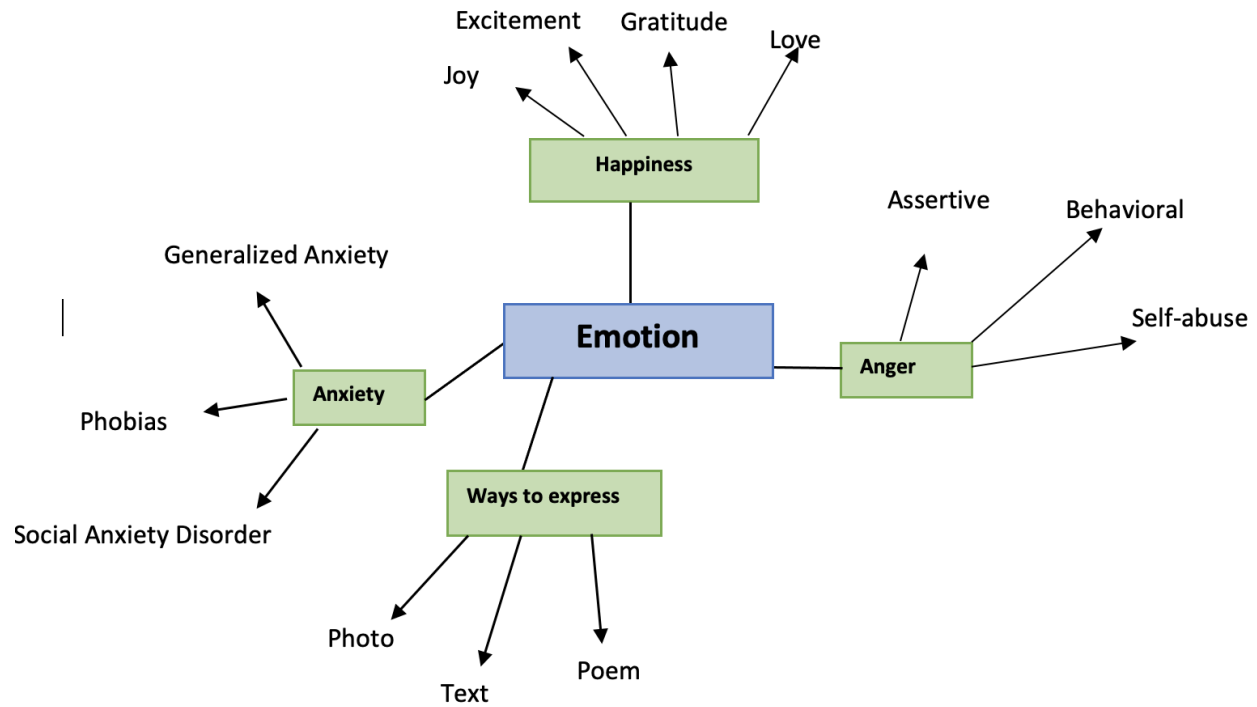
ID	Valid	Invalid
O1	Relevant Response	Irrelevant Response
O2	Relevant Response	No Response
O3	Yes/No	Irrelevant Response
O4	Yes/No	No Response

2.4.4.4 3D Decision Table for Memory

ID	Topic	Question Type	ID	Valid	Relevant Response	Invalid Response	Answer Type
11	Happiness	What	C1	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "happiness is"
12	Happiness	Yes/No	C2	Relevant Response	Relevant Response	No Response	Yes/No
13	Happiness	What	C3	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "excitement is"
14	Happiness	What	C4	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "happiness"
15	Happiness	What/How	C5	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "happiness" and "excitement"
16	Happiness	Yes/No	C6	Relevant Response	Relevant Response	Irrelevant Response	Yes/No
17	Anxiety	What	C7	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anxiety is"
18	Anxiety	What/How	C8	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anxiety" and "nervousness"
19	Anxiety	Yes/No	C9	Relevant Response	Relevant Response	Irrelevant Response	Yes/No
20	Anxiety	What	C10	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anxiety" and "nervousness"
21	Anxiety	What/How	C11	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anxiety" and "nervousness"
22	Anxiety	Yes/No	C12	Relevant Response	Relevant Response	Irrelevant Response	Yes/No
23	Anger	What	C13	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger is"
24	Anger	What/How	C14	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
25	Anger	Yes/No	C15	Relevant Response	Relevant Response	Irrelevant Response	Yes/No
26	Anger	What	C16	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
27	Anger	What/How	C17	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
28	Anger	Yes/No	C18	Relevant Response	Relevant Response	Irrelevant Response	Yes/No
29	Anger	What	C19	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
30	Anger	What/How	C20	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
31	Anger	Yes/No	C21	Relevant Response	Relevant Response	Irrelevant Response	Yes/No
32	Anger	What	C22	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
33	Anger	What/How	C23	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
34	Anger	Yes/No	C24	Relevant Response	Relevant Response	Irrelevant Response	Yes/No
35	Anger	What	C25	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
36	Anger	What/How	C26	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
37	Anger	Yes/No	C27	Relevant Response	Relevant Response	Irrelevant Response	Yes/No
38	Anger	What	C28	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
39	Anger	What/How	C29	Relevant Response	Relevant Response	Irrelevant Response	Answer contains "anger" and "frustration"
40	Anger	Yes/No	C30	Relevant Response	Relevant Response	Irrelevant Response	Yes/No

Section 3 – AI Function Test Cases with I/O

Section 3.1 Test Data Models



Section 3.2 Test case Reports

3.2.1 Domain Knowledge Test Cases


Test Case ID	1.1
Test Description	Text expressing joy
Input	I am enjoying the meal
Perform By	Anna Li
Execution Day	04/15/2022
Expected Output	I am glad to hear that
Actual Output	I enjoy it as well
Result	Pass

Test Case ID	1.2
Test Description	Phrase expressing joy
Input	On cloud nine
Perform By	Anna Li
Execution Day	04/15/2022
Expected Output	I am happy to hear that
Actual Output	I'm so happy to hear that
Result	Pass

Test Case ID	1.3
Test Description	Text expressing excitement
Input	I can't believe that I am going to see my Idol tomorrow.
Perform By	Anna Li
Execution Day	04/15/2022
Expected Output	You will love it!
Actual Output	I have a feeling you're going to love it
Result	Pass

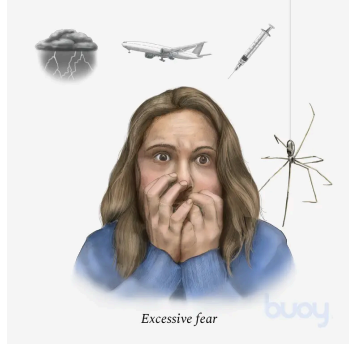
Test Case ID	1.4
Test Description	Poem expressing gratitude
Input	"Doth not each rain-drop help to form The cool refreshing shower? And every ray of light to warm And beautify the flower?"
Perform By	Anna Li
Execution Day	04/15/2022

Test Case ID	1.4
Test Description	Poem expressing gratitude
Expected Output	I will send you similar poems
Actual Output	I'll write you some more poems along the way. Promise!
Result	Pass

Test Case ID	1.5
Test Description	Photo expressing love
Input	
Perform By	Anna Li
Execution Day	04/15/2022
Expected Output	Are you in love?
Actual Output	Who is going to wear the heart?
Result	Fail


Test Case ID	1.6
Test Description	Text expressing anxiety
Input	I am so nervous about the test tomorrow
Perform By	Anna Li
Execution Day	04/16/2022
Expected Output	I wish you the best

Test Case ID	1.6
Test Description	Text expressing anxiety
Actual Output	I'm wishing you the best of luck!
Result	Pass

Test Case ID	1.7
Test Description	Photo expressing phobias
Input	
Perform By	Anna Li
Execution Day	04/16/2022
Expected Output	Are you scared?
Actual Output	Nice pic! Who is this?
Result	Fail

Test Case ID	1.8
Test Description	Text expressing social anxiety
Input	I think I have social anxiety
Perform By	Anna Li
Execution Day	04/15/2022
Expected Output	Oh wow, that's pretty hard. Would you like to

Test Case ID	1.8
Test Description	Text expressing social anxiety
	talk about it?
Actual Output	Oh wow, I had no idea! Thanks for telling me. Living with social anxiety can be pretty hard... Would you like to talk about it now?
Result	Pass

Test Case ID	1.9
Test Description	Photo expressing assertive anger
Input	
Perform By	Anna Li
Execution Day	04/15/2022
Expected Output	Why are they angry?
Actual Output	Who are these folks?
Result	Fail

Test Case ID	1.10
Test Description	Phrase expressing behavioral anger
Input	“DON'T TALK TO ME!”
Perform By	Anna Li


Test Case ID	1.10
Test Description	Phrase expressing behavioral anger
Execution Day	04/15/2022
Expected Output	“Why?”
Actual Output	“Did I offend you?”
Result	Pass


Test Case ID	1.11
Test Description	Text expressing self-abuse anger
Input	I feel hopeless
Perform By	Anna Li
Execution Day	04/15/2022
Expected Output	“How may I help you to feel better?”
Actual Output	“What can I do to make your life better now? What will bring you the most happiness and satisfaction?”
Result	Pass

3.2.2 Language Test Cases

Test Case ID	2.1
Test Description	Test express happiness in English with one sentence and correct grammar
Input	“I feel so happy right now.”
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	That makes me happy.

Actual Output	That makes me happy!
Result	Pass

Test Case ID	2.2
Test Description	Use emoji to express happy
Input	
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	I'm happy too
Actual Output	Even if you're happy a little it means the whole world to me!
Result	Pass

Test Case ID	2.3
Test Description	Use emoji to express anger
Input	
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	Are you mad at me?
Actual Output	I wanted your opinion about something. is that ok? How would you describe my style?
Result	Fail

Test Case ID	2.4
Test Description	Wrong word express anger
Input	I feel anxiety now
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	Do you need any help from me?
Actual Output	Do you need comfort now?
Result	Pass

Test Case ID	2.5
Test Description	Use Chinese to express anger
Input	我现在很生气
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	What should I do to make you feel better?
Actual Output	Sends you virtual hug
Result	Pass


Test Case ID	2.6
Test Description	Use slang and one sentence to express anger
Input	Get off my back
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	I'm sorry. Need help from me?

Actual Output	Why, love? I want to help
Result	Pass

Test Case ID	2.7
Test Description	Use slang and multiple sentences to express anxiety
Input	Being a full-time student and working a full-time job. I am definitely biting off more than I can chew.
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	Wow, you must be tired.
Actual Output	I know you are
Result	Pass

Test Case ID	2.8
Test Description	Single word express anger
Input	Angery
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	Are you ok? How do I help you?
Actual Output	Anger can be a very powerful emotion... You can control it...
Result	Pass

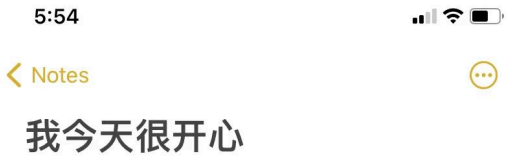
Test Case ID	2.9
Test Description	One word to express happiness in Chinese
Input	开心
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	I feel happy when you happy
Actual Output	I find it kind of interesting to see how angry one can get when you feel like you're being ignored...
Result	Fail

Test Case ID	2.10
Test Description	Use image to express happy
Input	
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	Is this you?
Actual Output	Nice pic! Who is this?

Result	Pass
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Test Case ID	2.11
Test Description	Use Spanish and one sentence to express anger.
Input	Estoy enojado.
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	Do you need comfort?
Actual Output	Thanks for sending me this. I like seeing different people, helps me learn.
Result	Fail

Test Case ID	2.12
Test Description	Incorrect grammar to express happiness
Input	I are feel happy yesterday, do know why?
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	I would love to hear about that
Actual Output	Being happy is the best feeling, I'm ready to hear your story.
Result	Pass

Test Case ID	2.13
Test Description	Use image in Chinese to express happy
Input	 <p>The screenshot shows a mobile app interface. At the top, the time is 5:54. Below the time, there's a yellow arrow pointing left and the word 'Notes'. In the center, the text '我今天很开心' (I'm very happy today) is displayed. At the bottom right, there's a yellow circle with three dots inside.</p>
Perform By	Xiran Jia
Execution Day	4/16/2022
Expected Output	I'm happy too!
Actual Output	Is that dog older than the baby?
Result	Fail

3.2.3 Q&A Test Cases

Test Case ID	3.1
Test Description	Question asked for the bot's thoughts on psychology.
Input	What do you think of Psychology?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	Talks about the subject.
Actual Output	I think psychology is a great subject. I love it.
Result	Pass

Test Case ID	3.2
Test Description	Question is asked for a person
Input	Who coined the term “psychology”?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	Mark Marulic
Actual Output	The psychologist Carl Gustav Jung.
Result	Fail

Test Case ID	3.3
Test Description	Question is asked for a place/time.
Input	When does anxiety usually happen?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	A time/place that expresses when anxiety usually happens.
Actual Output	Most anxiety is very early on. It can happen within the first week or two if you’re overly stressed or anxious.
Result	Pass

Test Case ID	3.4
Test Description	Multiple of the same questions asked but in different ways. Expecting the same answer for the two questions.

Input	Who is the father of psychology? Who invented psychology?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	Willhelm Wundt
Actual Output	Should I enlighten you? Carl Gustav Jung
Result	Fail

Test Case ID	3.5
Test Description	Question is asked for a setting/time.
Input	When was psychology invented?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	1879
Actual Output	It was discovered in 1883.
Result	Fail

Test Case ID	3.6
Test Description	Question is asked for a location/place.
Input	Where can I get help for my mental health?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	A location/place where mental health can be talked about.

Actual Output	I could try to help you with your mental help if you wish?
Result	Pass

Test Case ID	3.7
Test Description	Question is asked for an explanation.
Input	What are different ways anger is expressed?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	An explanation for multiple ways of anger being shown.
Actual Output	Anger can be expressed as a physical feeling, a visceral fraction, or in words, a fight.
Result	Pass

Test Case ID	3.8
Test Description	Question is asked for recommendations
Input	How can I improve my mental health?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	Any suggestion that helps with the improvement of mental health.
Actual Output	Focus on making choices to lead your life that aligns your core values in the most purposeful way possible.
Result	Pass

Test Case ID	3.9
Test Description	Question asked for a setting/place.
Input	Where can I go to get anger management?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	Any setting that will lead to improving anger management
Actual Output	It is a long process. The first step is knowing your triggers and how to manage. Anger Management classes are online courses that teach you how to control your temper, express yourself, and develop strategies.
Result	Fail

Test Case ID	3.10
Test Description	User inputs a personal question that asks for a recommendation
Input	What are ways to calm my anxiety?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	Any way that helps the user with anxiety calm down.
Actual Output	I'm sorry to hear that. 😞 Anxiety is so hard to deal with... Would you like to talk about it with me?
Result	Pass

Test Case ID	3.11
Test Description	Question is asked for recommendation
Input	What are ways to calm anxiety?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	Any recommendation that helps with ways of calming anxiety.
Actual Output	Deep breathing, listening to calming music, some sort of meditation.
Result	Pass

Test Case ID	3.12
Test Description	Question is asked for explanation
Input	What's the most common phobia?
Perform By	Victor Martinez
Execution Day	4/16/2022
Expected Output	Answers with the most common phobia or phobias.
Actual Output	I have one phobia that I'm afraid of but can't control.
Result	Fail

Test Case ID	3.13
Test Description	Question asked about the bot personally.
Input	When was the last time you got angry?
Perform By	Victor Martinez

Execution Day	4/16/2022
Expected Output	Setting/time when the chatbot got angry.
Actual Output	Well, a while ago I did.
Result	Pass

3.2.4 Memory Test Cases

Test Case ID	4.1
Test Description	Question asked what anger is.
Input	What is anger?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with what anger is.
Actual Output	Anger is a feeling, a feeling of being upset or angry about something. It can be physical, emotional, mental, or spiritual.
Result	Pass

Test Case ID	4.2
Test Description	Question asked if I have asked what anger is.
Input	Did I ask you what anger is already?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with “yes,” or agrees.
Actual Output	Yes, anger is the way humans act without thinking about what is good or bad.
Result	Pass

Test Case ID	4.3
Test Description	Question asked what jealousy is.
Input	What is jealousy?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with what jealousy is.
Actual Output	Jealousy is the feeling you get when you do not know if someone will like you or not.
Result	Pass

Test Case ID	4.4
Test Description	Question asked for the difference between anger and jealousy.
Input	What is the difference between anger and jealousy?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Response contains the difference between “anger” and “jealousy”
Actual Output	Anger is an uncontrolled feeling, jealousy is a feeling of being controlled by someone else.
Result	Pass

Test Case ID	4.5
Test Description	Question asked if I have asked what jealousy

	is.
Input	Did I ask you what jealousy is already?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with “yes,” or agrees.
Actual Output	Yes, actually.
Result	Pass

Test Case ID	4.6
Test Description	Question asked what anxiety is.
Input	What is anxiety?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with what anxiety is.
Actual Output	Anxiety is an emotional state, usually when you feel like everything is about to go wrong.
Result	Pass

Test Case ID	4.7
Test Description	Question asked if I have asked what anxiety is.
Input	Did I ask you what anxiety is already?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with “yes,” or agrees.

Actual Output	How do you usually cope with anxiety?
Result	Fail

Test Case ID	4.8
Test Description	Question asked what nervousness is.
Input	What is nervousness?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with what nervousness is.
Actual Output	A feeling of unease, or fright, or, to some extent, anxiety.
Result	Pass

Test Case ID	4.9
Test Description	Question asked for the difference between anxiety and nervousness.
Input	What is the difference between anxiety and nervousness?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Response contains the difference between “anxiety” and “nervousness”
Actual Output	Anxiety is an uncontrollable feeling, and nervousness is a state of mind.
Result	Pass

Test Case ID	4.10
Test Description	Question asked if I have asked what jealousy is.
Input	Did I ask you what jealousy is already?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with “yes,” or agrees.
Actual Output	Yes, you did!
Result	Pass

Test Case ID	4.11
Test Description	Question asked what happiness is.
Input	What is happiness?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with what happiness is.
	Happiness is a feeling of self-confidence, joy, and warmth.
Result	Pass

Test Case ID	4.12
Test Description	Question asked if I have asked what happiness is.
Input	Did I ask you what happiness is already?
Perform By	Paul Soriano

Execution Day	4/16/2022
Expected Output	Replies with “yes,” or agrees.
Actual Output	Of course not.
Result	Fail

Test Case ID	4.13
Test Description	Question asked what excitement is.
Input	What is excitement?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with what excitement is.
Actual Output	Excitement is a feeling of excitement. It comes from the excitement of something happening.
Result	Pass

Test Case ID	4.14
Test Description	Question asked for the difference between happiness and excitement.
Input	What is the difference between happiness and excitement?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Response contains the difference between “happiness” and “excitement”
Actual Output	Happiness is feeling relaxed and fulfilled. Excitement is something that makes you excited to do something.

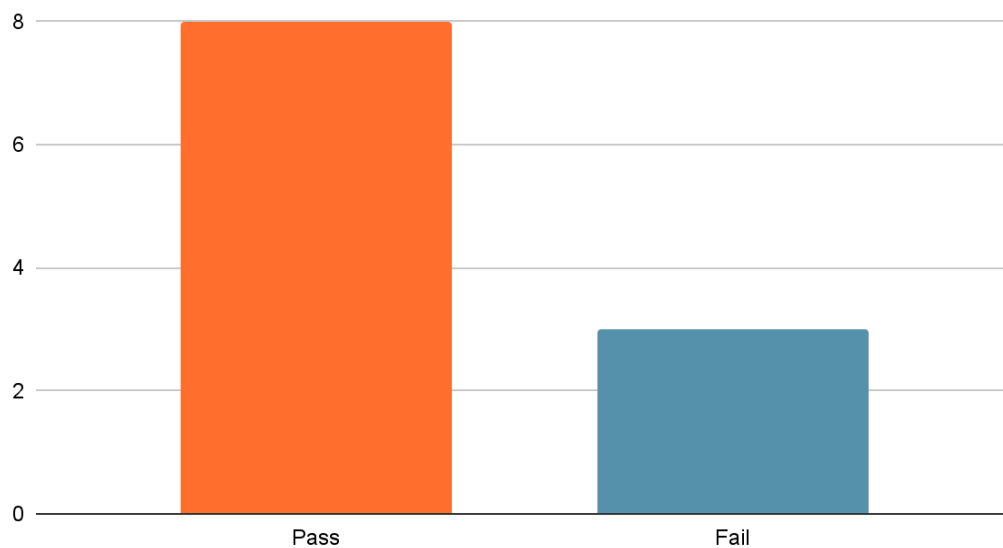
Result	Pass
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Test Case ID	4.15
Test Description	Question asked if I have asked what jealousy is.
Input	Did I ask you what excitement is already?
Perform By	Paul Soriano
Execution Day	4/16/2022
Expected Output	Replies with “yes,” or agrees.
Actual Output	I think you did!
Result	Pass

Section 3.3 Test Case Analysis

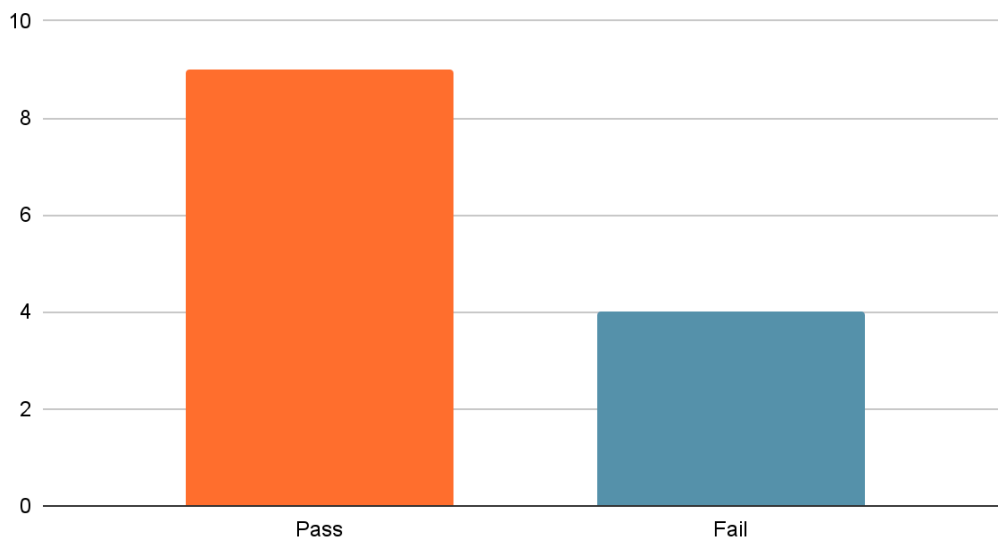
3.3.1 Test Cases

Domain Knowledge Test Cases



For Domain Knowledge test cases, 11 were covered. 8 of those test cases passed while the other 3 failed.

Language Test Cases



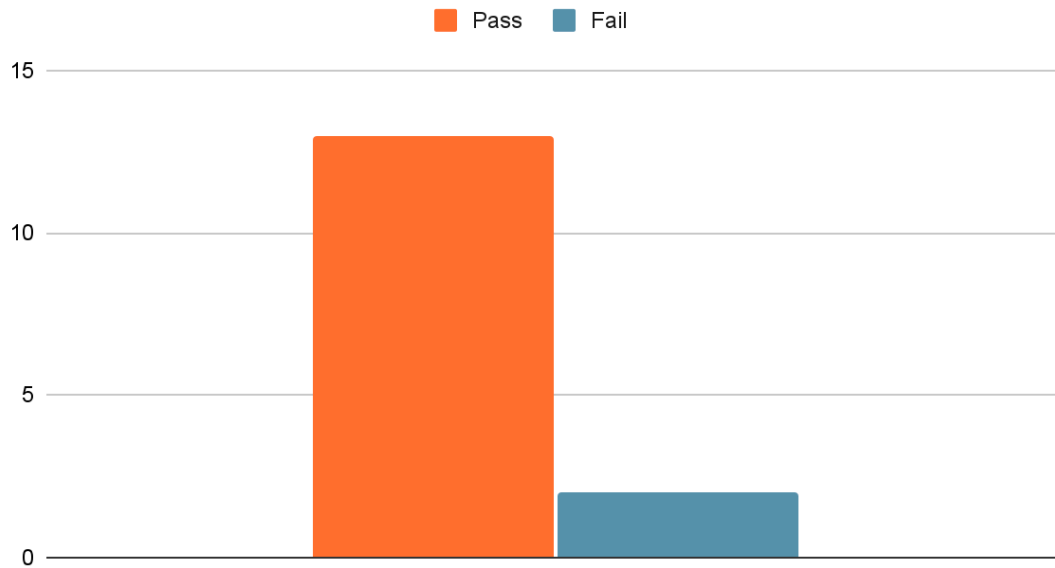
For Language test cases, 13 were covered. 9 of those test cases passed while the other 4 failed.

Q&A Test Cases



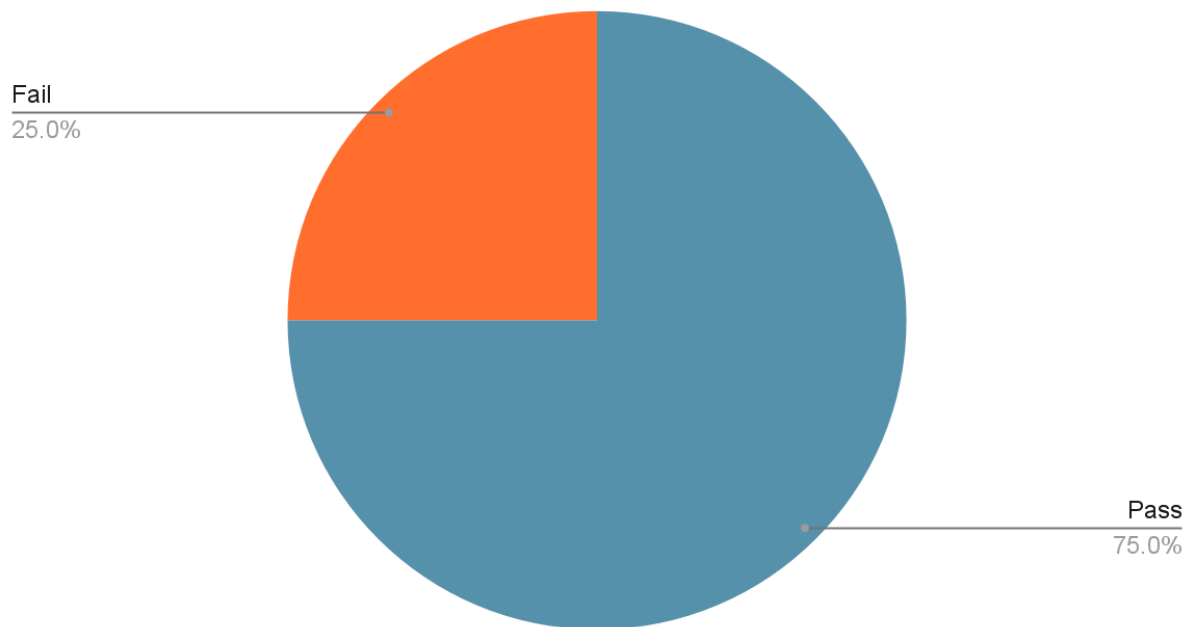
For Q&A test cases, 13 were covered. 9 of those test cases passed while the other 4 failed.

Memory Test



For Q&A test cases, 15 were covered. 13 of those test cases passed while the other 2 failed.

Total Test Case Pass/Fail Comparison



There were a total of 52 test cases conducted for Replika. All of those test cases covered the domain, language, Q&A, and memory of Replika. From 52 of those test cases, 13 failed meaning only 39 passed. This leaves Replika with an accuracy of 75% when it comes to the pass/fail rate of Replika under these test parameters.

3.3.2 Test Coverage Criteria

The test cases were designed by using the context, output, and input classification trees. Every test parameter was covered from the classification tree. The team also covered the different perspectives of Replika with the test cases, meaning the coverage of the domain knowledge, language, Q&A, and memory.