COCO-CHATBOT

Team 6

Coco is the chat bot to go to if you have any questions about smart watches.

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Table of Contents

Chatbot Domain	3
Ontology	3
Competency questions & Test cases	5
Question 1	5
Question 2	5
Question 3	5
Question 4	5
Question 5	6
Question 6	6
Training Question-Answers	6
Question 1	6
Question 2	6
Question 3	6
Question 4	7
Question 5	7
Question 6	7
Intent Development	7
General intents	7
Welcome	7
Default Fallback Intent	8
GetName	9
Thanks	10
Goodbye	11
Buy – yes	12
Buy – no	13
Smart watch specific intents	14
SW_Battery	14
SW_Features	15
SW_Featutres – more	16
SW_Manufacturers	17
SW_Price	18
SW_Sensors	18

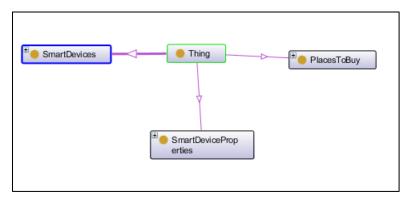
SW_Stores	19
SW_Touchscreen	19
SW_Types	20
Types – Simple	21
Types – Classic	21
Types – PhoneFunc	22
Types – Sport	23
Types – later	23
Evaluation	24
Questions answers evaluation	24
Question 1	24
Question 2	25
Question 3	26
Question 4	27
Question 5	28
Question 6	29
Questions test cases summary	29
Human evaluation	30
Conversation Example	30

Chatbot Domain

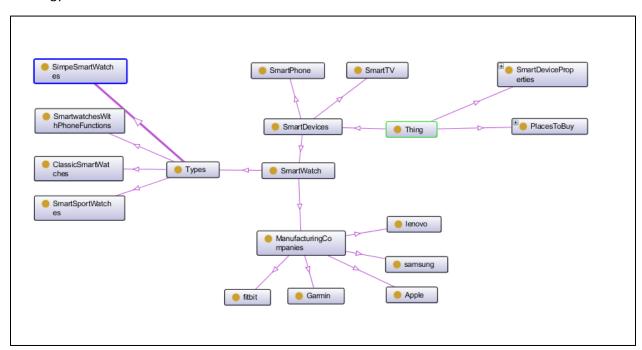
Answering users' questions about smart watches.

Ontology

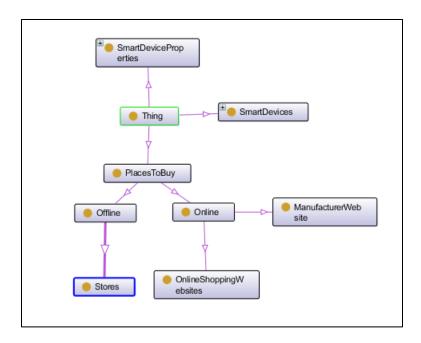
Overall ontology of the whole topic:



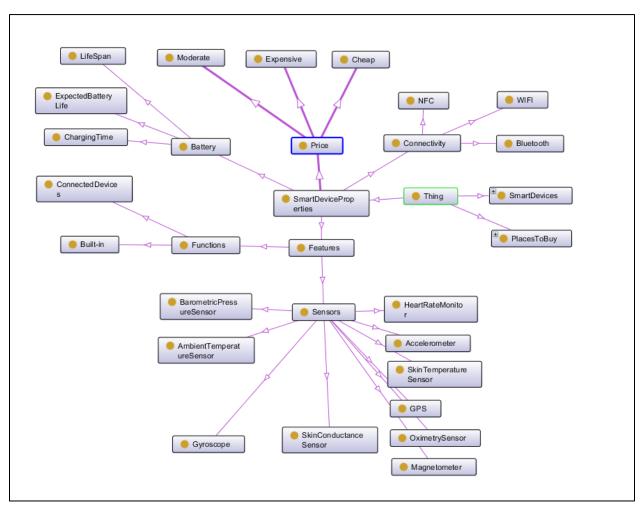
Ontology of smart devices:



Ontology of places to buy smart devices from:



Ontology of smart device properties:



Competency questions & Test cases

After evaluating the ontology of smart watch, the following questions were selected to limit the scope of the chatbot knowledge implementation. For every question 5 more variations of it were created to test the chatbot ability of answering similar question correctly.

Question 1

Question	What are the features included in smart watch?
Test cases	1) What sensors are integrated in smart watch?
	2) What are the benefits of buying smart watches?
	3) How can smart watch improve my life?
	4) Why do I need to buy smart watch?
	5) Is smart watch useful?
	6) why buy a smart watch?

Question 2

Question	What is the expected battery life of smart watch?
Test cases	 How long can smart watch work? How much time can smart watch battery last? How often do I need to charge my smart watch? When will the smart watch battery be damaged? When do I need to change my smart watch battery?

Question 3

Question	What companies produces smart watch?
Test cases	 Which companies are specialized in manufacturing of smart watches? What are famous smart watches brands? Who are the best companies around the world that make smart watches? Who are the suppliers of smart watches? What are the available tech companies that make smart watches? Which groups provide smart watches?

Question 4

Question	What are types of smart watch?
Test cases	 Do smart watches have many types? Is there a smart watch without a touch screen? What are different versions of smart watch? What are different screen types of smart watch? What are the available models of smart watches? What are the latest models of smart watch?

Question	Where can I buy smart watch?
Answer	1) What stores can I buy smart watch from?
	2) What are the available places to buy smart watch?
	3) Where can I purchase the best smart watch from?
	4) Which places can I get smart watch from?
	5) What are famous stores that I can buy smart watches from?
	6) Which is the best place to buy smart watch?

Question 6

Question	How much does smart watch cost?
Test cases	1) How expensive is smart watch?
	2) What is the price range of smart watch?
	3) Is smart watches affordable?
	4) What is the average budget of smart watch?
	5) Which smart watch is the best in low price?

Training Question-Answers

The following are the selected questions answers.

Question 1

Question	What are the features included in smart watch?
Answer	Smartwatches come with a lot more functionality than regular digital models. They usually consist of a touch screen interface and are able to connect to your phone or the internet. would you like to know more?
Follow up answers	If the user asks for more features, more benefits will be presented to the user.

Question 2

Question	What is the expected battery life of smart watch?
Answer	smartwatches batteries last up-to 7-8 hours on an average on a single charge. The
	total lifespan is 2.5-3 years.

Question 3

Question	What companies produces smart watch?
Answer	Top 5 smart watch manufacturers are:
	1-Apple
	2-samsung
	3-lenovo
	4-Garmin

5-fitbit	
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Question	What are types of smart watch?
Answer	Smart sport watches, Classic smart watches, Simple smart watches, Smart watches
	with phone function, which one do you want to know more about?
Follow up	If the user asks for more information about any smart watch type, he will be
answers	presented with extra information about the selected smart watch type.

Question 5

Question	Where can I buy smart watch?
Answer	you can make an order from Amazon or Jumia website. or you can visit any major
	Tech store to buy a smart watch.

Question 6

Question	How much does smart watch cost?
Answer	The best smartwatches generally cost between \$300 and \$400.

Intent Development

Using Google DialogueFlow service for the chatbot development, a new chatbot agent was created using the following intents:

General intents

Welcome

Description

An intent to welcome the user, introduce the chatbot and ask the user for his name.

Context







Default Fallback Intent

Description

A default fallback intent for the chatbot activated when the user says something that the chatbot does not understand

Context

No context is required for this intent

Training phrases

No training phrases are required for this intent

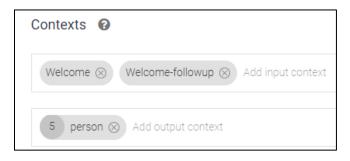
Text Response	
1	I didn't get that. Can you say it again?
2	I missed what you said. What was that?
3	Sorry, could you say that again?
4	Sorry, can you say that again?
5	Can you say that again?
6	Sorry, I didn't get that. Can you rephrase?
7	Sorry, what was that?
8	One more time?
9	What was that?
10	Say that one more time?
11	I didn't get that. Can you repeat?
12	I missed that, say that again?
13	Enter a text response variant

GetName

Description

An intent to welcome the user using his name, activates "Person" context to keep track of the user's name.

Context





Text Response	
1	Hi, \$person .What would you like to know about smart watches?
2	Enter a text response variant

Thanks

Description

An intent to reply to the users' gratitude for the chatbot's help and asks the user if he will buy a smartwatch or not then it activates the "BuySW" context.

Context





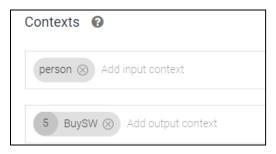


Goodbye

Description

An intent to respond to user leaving, and asks if the user will buy a smart watch or not, so it activates the "BuySW" context

Context





Text Response	
1	It was my pleasure #person.person, See you later. Are you going to buy a smart watch?
2	Goodbye #person.person. Are you going to buy a smart watch?
3	Enter a text response variant

Buy – yes

Description

An intent activated when the user answers to chatbot question about buying a smartwatch with an intent to buy a smartwatch.

Context







Buy - no

Description

An intent activated when the user answers to chatbot question about buying a smartwatch with an intent to not buy a smartwatch.

Context



Training phrases



Responses

Text Response	
1	Then I will try to convince you next time.
2	I will study some more to convince you next time!
3	No worries. At least you now know what you'll be missing.
4	Enter a text response variant

Smart watch specific intents

SW_Battery

Description

An intent to answer users' questions about smartwatch battery.

Context

No specific input or output context exist for this intent

99	Can smart watch battery last for @date ?
99	When do I need to change my smart watch battery?
99	When will the smart watch battery be damaged?
99	How often do I need to charge my smart watch?
99	How much time can smart watch battery last?
99	How long can smart watch work?
99	What is the expected battery life of smart watch?

Text Response

- 1 smartwatches batteries last up-to 7-8 hours on an average on a single charge. The total lifespan is 2.5-3 years.
- 2 Enter a text response variant

SW_Features

Description

An intent to answer users' questions about smartwatch features.

Context



Training phrases





Text Response

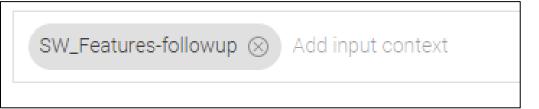
- 1 Smartwatches come with a lot more functionality than regular digital models. They usually consist of a touch screen interface and are able to connect to your phone or the internet, would you like to know more?
- 2 Enter a text response variant

SW_Featutres – more

Description

An intent to answer users' questions about wanting to know more smartwatch features.

Context



Training phrases



Text Response You can quickly locate your phone using the 'Find Your Phone' feature on your smartwatch. Once you start the find my phone process on your smartwatch, the phone will begin ringing loudly. Navigating with your phone in hand can be a bit cumbersome. Driving or cycling while holding a phone divides the driver's attention. In many places, it's illegal to do so. As you look at your wrist, you will find all the information you need right on it, there is no chance of being distracted. Connecting your smartwatch to your phone allows you to make and receive calls from the watch. In addition, users can use the smartwatch without a phone. The smartwatch can receive/place calls using the built-in sim card on some models. Watches with smart notifications allow users to view phone notifications directly on their wrist. A smartwatch can receive notifications for social media, apps, and messages once linked to a smartphone. With the help of a drop sensor, smartwatches can detect falls. A fall sensor automatically alerts the user if it detects a fall. In the event of the wearer not responding to a smartwatch alarm within a short period, the watch automatically makes an emergency call for help. An older person who is more prone to falling might find this feature particularly useful. smartwatches have built-in microphones, you have the option of entering voice commands. You can even compose text messages and emails. smartwatches are waterproof, when you're a fan of running in the rain, swimming, your gadget will have protection.

SW_Manufacturers

Description

An intent to answer users' questions about wanting to know about smartwatch manufacturers.

Context

No specific input or output context exist for this intent

Training phrases

99	Which brand of smart watch is best to buy?
99	Which groups provide smart watches?
99	What are the available tech companies that make smart watches?
99	Who are the suppliers of smart watches?
99	Which companies are specialized in manufacturing of smart watches?
99	What are famous smart watches brands?
99	What companies produce smart watch?

Tex	Text Response	
1	Top 5 smart watch manufacturers are: 1-Apple 2-samsung 3-lenovo 4-Garmin 5-fitbit	
2	Enter a text response variant	

SW Price

Description

An intent to answer users' questions about wanting to know about smartwatch prices.

Context

No specific input or output context exist for this intent

Training phrases



Responses



SW_Sensors

Description

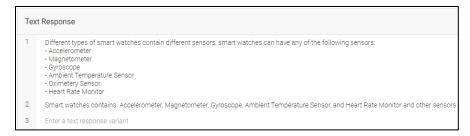
An intent to answer users' questions about wanting to know about smartwatch sensors.

Context

No specific input or output context exist for this intent

Training phrases

Do smart watches contain sensors?What sensors are integrated in smart watches?



SW Stores

Description

An intent to answer users' questions about wanting to know about where to buy smartwatch.

Context

No specific input or output context exist for this intent

Training phrases



Responses

Text Response you can make an order from Amazon or Jumia website. or you can visit any major Tech store to buy a smart watch. Enter a text response variant

SW_Touchscreen

Description

An intent to answer users' questions about wanting to know about smartwatch having touchscreens or not.

Context

No specific input or output context exist for this intent

55 Is there a smart watch without a touch screen?

Responses



SW_Types

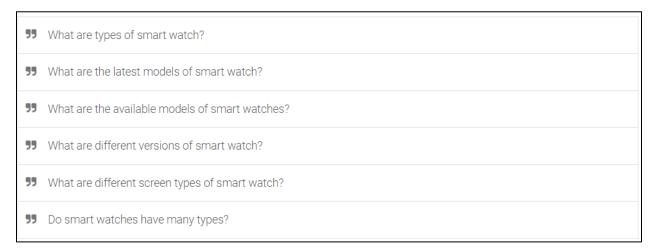
Description

An intent to answer users' questions about wanting to know about different smartwatch types.

Context



Training phrases





Types – Simple

Description

An intent to answer users' questions about wanting to know about simple smartwatch type.

Context



Training phrases



Responses



Types – Classic

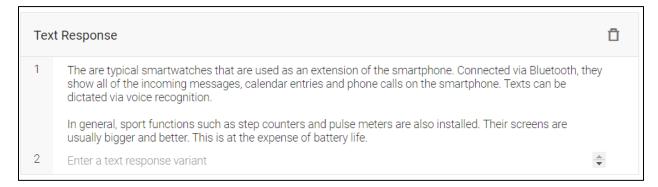
Description

An intent to answer users' questions about wanting to know about classic smartwatch type.

Context







Types - PhoneFunc

Description

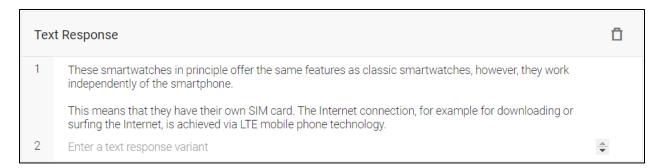
An intent to provide the user with more information about the smart watch with phone functions, it is activated only when the "SW_Types-followup" context is active.

Context



Training phrases





Types – Sport

Description

An intent to provide the user with more information about the sports smart watch, it is activated only when the "SW_Types-followup" context is active.

Context



Training phrases



Responses



Types – later

Description

An intent to handle user not wanting to ask about any specific smart watch type.

Context





Training phrases



Responses



Evaluation

The chatbot can be accessed through the following <u>link</u>.

Questions answers evaluation

Question 1

Question	What are the features included in smart watch?
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Answer	Smartwatches come with a lot more functionality than regular digital models.
	They usually consist of a touch screen interface and are able to connect to your
	phone or the internet. would you like to know more?
Answer Evaluation	Correct answers, it's relevant to the question.

Test Cases for question 1

TC1	What sensors are integrated in smart watch?
Answer	Different types of smart watches contain different sensors. Smart watches can
	have any of the following sensors: - Accelerometer - Magnetometer -
	Gyroscope - Ambient Temperature Sensor - Oximetery Sensor - Heart Rate
	Monitor.
Answer Evaluation	Correct answers, it's relevant to the question.
TC2	What are the benefits of buying smart watches?
Answer	Smartwatches come with a lot more functionality than regular digital models.
	They usually consist of a touch screen interface and are able to connect to your
	phone or the internet. would you like to know more?
Answer Evaluation	Correct answers, it's relevant to the question.
TC3	How can smart watch improve my life?
Answer	smartwatches batteries last up-to 7-8 hours on an average on a single charge.
	The total lifespan is 2.5-3 years.
Answer Evaluation	Incorrect answer, it isn't related to the question.
TC4	Why do I need to buy smart watch?
Answer	Smartwatches come with a lot more functionality than regular digital models.
	They usually consist of a touch screen interface and are able to connect to your
	phone or the internet. would you like to know more ?
Answer Evaluation	Correct answers, it's relevant to the question.
TC5	Is smart watch useful?
Answer	Smartwatches come with a lot more functionality than regular digital models.
	They usually consist of a touch screen interface and are able to connect to your
	phone or the internet. would you like to know more ?
Answer Evaluation	Correct answers, it's relevant to the question.
TC6	why buy a smart watch?
Answer	you can make an order from Amazon or Jumia website. or you can visit any
	major Tech store to buy a smart watch.
Evaluation Answer	Incorrect answer, it isn't related to the question.

Question 2

Question	What is the expected battery life of smart watch?
Answer	smartwatches batteries last up-to 7-8 hours on an average on a single charge.
	The total lifespan is 2.5-3 years.
Answer Evaluation	Correct answer, it is relevant to the question.

Test Cases for question 2

TC1	How long can smart watch work?
Answer	smartwatches batteries last up-to 7-8 hours on an average on a single charge.
	The total lifespan is 2.5-3 years.
Answer Evaluation	Correct answer, it is relevant to the question.
TC2	How much time can smart watch battery last?
Answer	smartwatches batteries last up-to 7-8 hours on an average on a single charge.
	The total lifespan is 2.5-3 years.
Answer Evaluation	Correct answer, it is relevant to the question.
TC3	How often do I need to charge my smart watch?
Answer	smartwatches batteries last up-to 7-8 hours on an average on a single charge.
	The total lifespan is 2.5-3 years.
Answer Evaluation	Correct answer, it is relevant to the question.
TC4	When will the smart watch battery be damaged?
Answer	smartwatches batteries last up-to 7-8 hours on an average on a single charge.
	The total lifespan is 2.5-3 years.
Answer Evaluation	Correct answer, it is relevant to the question.
TC5	When do I need to change my smart watch battery?
Answer	smartwatches batteries last up-to 7-8 hours on an average on a single charge.
	The total lifespan is 2.5-3 years.
Answer Evaluation	Correct answer, it is relevant to the question.

Question 3

Question	What companies produces smart watch?
Answer	Top 5 smart watch manufacturers are: 1-Apple
	2-samsung
	3-lenovo
	4-Garmin
	5-fitbit
Answer Evaluation	Correct answer, it is relevant to the question.

Test Cases for question 3

est eases for question 5	
TC1	Which companies are specialized in manufacturing of smart watches?
Answer	Top 5 smart watch manufacturers are: 1-Apple
	2-samsung
	3-lenovo
	4-Garmin
	5-fitbit
Answer Evaluation	Correct answer, it is relevant to the question.
TC2	What are famous smart watches brands?
Answer	Top 5 smart watch manufacturers are: 1-Apple
	2-samsung

	3-lenovo 4-Garmin 5-fitbit
	3 Healt
Answer Evaluation	Correct answer, it is relevant to the question.
TC3	Who are the best companies around the world that make smart watches?
Answer	Top 5 smart watch manufacturers are: 1-Apple
	2-samsung
	3-lenovo
	4-Garmin
	5-fitbit
Answer Evaluation	Correct answer, it is relevant to the question.
TC4	Who are the best companies around the world that make smart watches?
Answer	Top 5 smart watch manufacturers are: 1-Apple
	2-samsung
	3-lenovo
	4-Garmin
	5-fitbit
Answer Evaluation	Correct answer, it is relevant to the question.
TC5	What are the available tech companies that make smart watches?
Answer	Top 5 smart watch manufacturers are: 1-Apple
	2-samsung
	3-lenovo
	4-Garmin
	5-fitbit
Answer Evaluation	Correct answer, it is relevant to the question.
TC6	Which groups provide smart watches?
Answer	Top 5 smart watch manufacturers are: 1-Apple
	2-samsung
	3-lenovo
	4-Garmin
	5-fitbit
Answer Evaluation	Correct answer, it is relevant to the question.

Question	What are types of smart watch?
Answer	Smart sport watches, Classic smart watches, Simple smart watches, Smart
	watches with phone function, which one do you want to know more about?
Answer Evaluation	Correct answer, it is relevant to the question.

Test Cases for question 4

TC1	Do smart watches have many types?

Smart sport watches, Classic smart watches, Simple smart watches, Smart
watches with phone function, which one do you want to know more about?
Correct answer, it is relevant to the question.
Is there a smart watch without a touch screen?
NO, all modern smartwatches provide a local touchscreen interface daily use.
Correct answer, it is relevant to the question.
What are different versions of smart watch?
Smart sport watches, Classic smart watches, Simple smart watches, Smart watches with phone function, which one do you want to know more about?
Correct answer, it is relevant to the question.
What are different screen types of smart watch?
Smart sport watches, Classic smart watches, Simple smart watches, Smart
watches with phone function, which one do you want to know more about?
Correct answer, it is relevant to the question.
What are the available models of smart watches?
Smart sport watches, Classic smart watches, Simple smart watches, Smart
watches with phone function, which one do you want to know more about?
Correct answer, it is relevant to the question.
What are the latest models of smart watch?
Smart sport watches, Classic smart watches, Simple smart watches, Smart
watches with phone function, which one do you want to know more about?
Correct answer, it is relevant to the question.

Question	Where can I buy smart watch?
Answer	you can make an order from Amazon or Jumia website. or you can visit any
	major Tech store to buy a smart watch.
Answer Evaluation	Correct answer, it is relevant to the question.

Test Cases for question 5

TC1	What stores can I buy smart watch from?
Answer	you can make an order from Amazon or Jumia website. or you can visit any major Tech store to buy a smart watch.
Answer Evaluation	Correct answer, it is relevant to the question.
TC2	What are the available places to buy smart watch?
Answer	you can make an order from Amazon or Jumia website. or you can visit any major Tech store to buy a smart watch.
Answer Evaluation	Correct answer, it is relevant to the question.
TC3	Where can I purchase the best smart watch from?

Answer	you can make an order from Amazon or Jumia website. or you can visit any major Tech store to buy a smart watch.
Answer Evaluation	Correct answer, it is relevant to the question.
TC4	Which places can I get smart watch from?
Answer	you can make an order from Amazon or Jumia website. or you can visit any major Tech store to buy a smart watch.
Answer Evaluation	Correct answer, it is relevant to the question.
TC5	What are famous stores that I can buy smart watches from?
Answer	you can make an order from Amazon or Jumia website. or you can visit any major Tech store to buy a smart watch.
Answer Evaluation	Correct answer, it is relevant to the question.
TC6	Which is the best place to buy smart watch?
Answer	you can make an order from Amazon or Jumia website. or you can visit any major Tech store to buy a smart watch.
Answer Evaluation	Correct answer, it is relevant to the question.

Question	How much does smart watch cost?
Answer	The best smartwatches generally cost between \$300 and \$400
Answer Evaluation	Correct answer, it is relevant to the question.

Test Cases for question 6

TC1	How expensive is smart watch?
Answer	The best smartwatches generally cost between \$300 and \$400
Answer Evaluation	Correct answer, it is relevant to the question.
TC2	What is the price range of smart watch?
Answer	The best smartwatches generally cost between \$300 and \$400
Answer Evaluation	Correct answer, it is relevant to the question.
TC3	Is smart watches affordable?
Answer	The best smartwatches generally cost between \$300 and \$400
Answer Evaluation	Correct answer, it is relevant to the question.
TC4	What is the average budget of smart watch?
Answer	The best smartwatches generally cost between \$300 and \$400
Answer Evaluation	Correct answer, it is relevant to the question.
TC5	Which smart watch is the best in low price?
Answer	The best smartwatches generally cost between \$300 and \$400
Answer Evaluation	Correct answer, it is relevant to the question.

Questions test cases summary

Total questions asked: **34**

Irrelevant answers: 2

Human evaluation

From our evaluation of the chatbot performance, the following was noticed:

- When the chatbot welcomes the user and asks for his name, some names are not recognized.
- When the user asks for the reason to buy smart watches, one reason will be presented to the
 user, then if the user asks for more reasons another one will be presented, but if the user keeps
 writing more the chatbot gets into fallback intent and does not understand what the user is
 saying.

Conversation Example

