



Natural Language Understanding - CSL7340

Chatbot for Company Related Facts

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Module - 1 (Chatbot):

- Tasks:**
1. Creation of Knowledge Base for chatbot
 2. Building a chatbot for company related facts
 3. Report 15 sample conversations with your chatbot

Dataset used: KnowledgeNet

Dataset link: <https://github.com/diffbot/knowledge-net/blob/master/dataset/train.json>

[1] KnowledgeNet is a benchmark dataset for the task of automatically populating a knowledge base (Wikidata) with facts expressed in natural language text on the web. It provides text exhaustively annotated with facts, enabling the holistic end-to-end evaluation of knowledge base population systems as a whole, unlike previous benchmarks that are more suitable for the evaluation of individual subcomponents (e.g., entity linking, relation extraction).

1. Creation of Knowledge Base for chatbot:

1.1. Company related data extraction from KnowledgeNet dataset

Link of Google Colab Code File:

<https://colab.research.google.com/drive/11AzgVmgcJc1p0GiyhOrOxulj5JVIBElu?usp=sharing>

1.1.1. Selected Company related facts from KnowledgeNet database on the basis of following features:

- DATE_FOUNDED (ORG-DATE)
- HEADQUARTERS (ORG-LOC)
- SUBSIDIARY_OF (ORG-ORG)
- FOUNDED_BY (ORG-PER)
- CEO (ORG-PER)

Length of Knowledgenet database: 3977

Key Parameters of Knowledgenet database: dict_keys(['fold', 'source', 'documentId', 'documentText', 'passages'])

The KnowledgeNet database consists of a total of 3977 distinct data about various facts. Out of these we will select the ones which are company related on the basis of features specified above.

1.1.2. Out of 3977 data, count of documents/facts with the relevant features are listed below:

```
Count of documents with 'SUBSIDIARY_OF' feature: 369
Count of documents with 'CEO' feature: 301
Count of documents with 'HEADQUARTERS' feature: 379
Count of documents with 'DATE_FOUNDED' feature: 408
Count of documents with 'DATE_FOUNDED' and 'FOUNDED_BY' features: 29
```

1.1.3. Further based on the following combinations, documentId of the facts are filtered to further reduce our knowledgebase (due to the time constraint):

- Companies with Subsidiaries and Founded on
- Companies with Subsidiaries and Headquarters

- Companies with CEO and Founded on
- Companies with CEO and Founded on and Founded by
- Companies with CEO and Subsidiaries
- Companies with Headquarters,CEO and Founded on
- Companies with Headquarters,CEO and Founded on and Founded by

```
Count of Companies with Subsidiaries and Founded on: 10
Count of Companies with Subsidiaries and Headquarters: 24
Count of Companies with CEO and Founded on: 24
Count of Companies with CEO and Founded on and Founded by: 4
Count of Companies with CEO and Subsidiaries: 9
Count of Companies with Headquarters,CEO and Founded on: 2
Count of Companies with Headquarters,CEO and Founded on and Founded by: 1
```

1.1.4. DocumentId of companies used for creating the knowledge base of our chatbot are:

➤ Document Id of Companies used for the knowledge base of our chatbot:
 ['7213', '7227', '7063', '7063', '1434', '1640', '18202', '1571', '2217', '1590', '1590', '13', '1635', '7189', '7063', '7063']

16 different company's facts are used to train our chatbot.

1.2. Creating train data for Chatbot using RASA

Using the data extracted in part 1.1., we have created the train data for our chatbot created using RASA in the following format:

For each of the above company, train data consists of following facts:

- Brief description of the company
- CEO of the company
- When was the company founded
- Founder of the company
- Headquarter of the company
- Subsidiaries of the company

```
utter_description_google:
- text: "Google is an internet search engine. It uses a proprietary algorithm that's designed to retrieve and order search results."

utter_ceo_google:
- text: "Sundar Pichai"

utter_founded_on_google:
- text: "4 September 1998"

utter_founded_by_google:
- text: "Larry Page and Sergey Brin"

utter_headquarter_google:
- text: "Mountain View, California, United States"

utter_subsidiaries_google:
- text: "YouTube, Dialogflow, Kaggle, Google AdMob, Looker, MORE"
```

Response for each of company's facts are listed in the given format:

- utter_description_<company_name>
- utter_ceo_<company_name>
- utter_founded_on_<company_name>
- utter_founded_by_<company_name>
- utter_headquater_<company_name>
- utter_subsidiaries_<company_name>

2. Building a chatbot for company related facts:

2.1. [2]Rasa is an open source machine learning framework for automated text and voice-based conversations and widely used for building customizable chatbots.

Steps Involved:

- Created a virtual environment. Command used (Windows): `python3 -m venv ./venv`
- Activated the environment. Command used (Windows): `.\venv\Scripts\activate`
- Installed Rasa open source using the pip command.
Command used (Windows): `pip3 install -U --user pip && pip3 install rasa`
- Created a new project. Command used : `rasa init`

2.2. Created company's related Intent in data/nlu.yml (It basically addresses what kind of questions the user can ask?)

Format used for creating intent for each company:

- company_desc_<company_name>
- ceo_<company_name>
- founded_on_<company_name>
- founded_by_<company_name>
- headquater_<company_name>
- subsidiaries_<company_name>

2.3. Created company's related Response to answer the facts (intent) about the company in domain.yml (It basically addresses what will be the Chatbot's response after classifying the intent of the user's message)

Format used for creating response for each company:

- utter_description_<company_name>
- utter_ceo_<company_name>
- utter_founded_on_<company_name>
- utter_founded_by_<company_name>
- utter_headquater_<company_name>
- utter_subsidiaries_<company_name>

2.4. Creating Stories in data/stories.yml

[2]Stories are examples of conversations that train a chatbot to respond correctly depending on what the user has said previously in the conversation. The story format shows the intent of the user message

followed by the chatbot's action or response. Example of few of the created stories are shown in the below screenshot

```
- story: AIM Your Way
  steps:
  - intent: greet
  - action: utter_greet
  - intent: faq_company
  - action: utter_faq_comapny
  - intent: company_desc_aim_your_way
  - action: utter_description_aim_your_way
  - intent: ceo_aim_your_way
  - action: utter_ceo_aim_your_way
  - intent: founded_on_aim_your_way
  - action: utter_founded_on_aim_your_way
  - intent: founded_by_aim_your_way
  - action: utter_founded_by_aim_your_way
  - intent: headquater_aim_your_way
  - action: utter_headquater_aim_your_way
  - intent: subsidiaries_aim_your_way
  - action: utter_subsidiaires_aim_your_way
```

```
- story: Safaricom
  steps:
  - intent: greet
  - action: utter_greet
  - intent: faq_company
  - action: utter_faq_comapny
  - intent: company_desc_safaricom
  - action: utter_description_safaricom
  - intent: ceo_safaricom
  - action: utter_ceo_safaricom
  - intent: founded_on_safaricom
  - action: utter_founded_on_safaricom
  - intent: founded_by_safaricom
  - action: utter_founded_by_safaricom
  - intent: headquater_safaricom
  - action: utter_headquater_safaricom
  - intent: subsidiaries_safaricom
  - action: utter_subsidiaires_safaricom
```

2.5. Specifying rules in data/rules.yml

[2]Rules describe parts of conversations that should always follow the same path no matter what has been said previously in the conversation. We want our assistant to always respond to a certain intent with a specific action, so we use a rule to map that action to the intent. Example of few of the rules created are shown in the below screenshot

```
- rule: Say goodbye anytime the user says goodbye
  steps:
  - intent: goodbye
  - action: utter_goodbye

- rule: Say 'I am a bot' anytime the user challenges
  steps:
  - intent: bot_challenge
  - action: utter_iamabot

- rule: Say 'Try again'
  steps:
  - intent: deny
  - action: utter_goodbye
```

2.5 Chatbot Tuning:

Configuring the config.yml to train our chatbot based on the specified knowledgebase.

- Preprocessing: Following tokenizers and Featurizer are used in the pipeline:
 - * Whitespace Tokenizer
 - * RegexFeaturizer

- * LexicalSyntacticFeaturizer
- * CountVectorFeaturizer
- * CountVectorsFeaturizer

- Classifier used: DIETClassifier. It is a transformer based architecture which is used for intent classification.
- Number of Epochs used: 100

2.6. Training the chatbot

To train the chatbot on the NLU data, stories, forms, rules and responses following commands are used

- Command (Windows) used to train the chatbot: `rasa train -c config.yml -d domain.yml`
- Command (Windows) used to interact with the chatbot: `rasa shell`
- Accuracy while training our Chatbot: 92.7%

```
Processed trackers: 100% | 524/524 [00:01<00:00, 378.68it/s, # intent=178]
Epochs: 100% | 100/100 [00:36<00:00, 2.71it/s, t_loss=0.28, loss=0.203, acc=0.95]
2022-04-22 01:46:16 INFO rasa.engine.training.hooks - Finished training component 'UnexpectedIntentPolicy'.
Your Rasa model is trained and saved at 'models\20220422-014018-woolen-yaw.tar.gz'.
(venv) PS C:\Users\pujag\OneDrive\Desktop\Semester2\NLP_Assign\Chatbot>
```

2.6. Testing the chatbot

Once the chatbot is trained we need to check whether it is working as per our requirement or not. To do so we will use test stories to check if the chatbot is working as expected and making the correct predictions or not.

- Command (Windows) used to validate our test data: `rasa data validate`

3. Report 15 sample conversations with your chatbot:

Here need to paste the screenshot of 15 different conversations with the chatbot

3.1. Conversation1:

```
2022-04-22 01:32:01 INFO root - Rasa server is up and running.
Bot loaded. Type a message and press enter (use '/stop' to exit):
Your input -> Hi
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturi
ng corporation,coyote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar H
oldings, compaq computer corporation,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM
. how may I help you?
Your input -> I need information
What do you want to know?
Your input -> CEO of google
Sundar Pichai
Your input -> CEO of facebook
Mark Zuckerberg
Your input -> details about Amazon
Amazon is guided by four principles: customer obsession rather than competitor focus, passion for inven
tion, commitment to operational excellence, and long-term thinking. Amazon strives to be Earth's most c
ustomer-centric company, Earth's best employer, and Earth's safest place to work. Customer reviews, 1-C
lick shopping, personalized recommendations, Prime, Fulfillment by Amazon, AWS, Kindle Direct Publishin
g, Kindle, Career Choice, Fire tablets, Fire TV, Amazon Echo, Alexa, Just Walk Out technology, Amazon S
tudios, and The Climate Pledge are some of the things pioneered by Amazon.
Your input -> When was Amazon founded
5 July 1994, Bellevue, Washington, United States
Your input -> Founder of google
Larry Page and Sergey Brin
Your input -> Bye
Bye
```

3.2. Conversation2:


```

Your input -> Hey
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation,co
yote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
on,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> Hey how are you
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation,co
yote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
on,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> I want to know more about some companies
What do you want to know?
Your input -> Subsidiaries of Facebook
Subsidiaries: PrivateCore, WhatsApp, Oculus VR, MORE
Your input -> Where is Google headquater
Mountain View, California, United States
Your input -> IBM was founded by
Charles Ranlett Flint
Your input -> TCS was founded by
J R D Tata
Your input -> Thanks
Your input -> Bye
Bye

```

3.3. Conversation3:

```

2022-04-22 02:01:00 INFO      root - Rasa server is up and running.
Bot loaded. Type a message and press enter (use '/stop' to exit):
Your input -> Hii
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manu
uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer
Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> I need information
What do you want to know?
Your input -> Can you tell me something about a company
What do you want to know?
Your input -> Hii
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manu
uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer
Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> Bye
Bye

```

3.4. Conversation4:

```

Your input -> Hii
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation,co
yote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
on,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> Hello
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation,co
yote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
on,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> good morning
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation,co
yote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
on,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> I need brief information about some companies
What do you want to know?
Your input -> Description of Mozilla
coordinates and integrates the development of Internet-related applications such as the Firefox web browser, by a global
community of open-source developers, some of whom are employed by the corporation itself.
Your input -> Brief Description of compaq computer corporation
Compaq Computer Corporation (sometimes abbreviated to CQ prior to a 2007 rebranding) was an American information technol
ogy company founded in 1982 that developed, sold, and supported computers and related products and services.
Your input -> Details about Carbon Care Asia
a social business in carbon strategy and sustainability innovation.
Your input -> Ok Bye
Your input -> Byee
Bye

```

3.5. Conversation5:

```

Your input -> Hii
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing
uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> I need information
What do you want to know?
Your input -> Deatails about TCS
Tata Consultancy Services is a global leader in IT services, consulting & business solutions with a large
ery centers.
Your input -> Details about carbon Care Asia
a social business in carbon strategy and sustainability innovation.
Your input -> Details about Yahoo
Yahoo is an American web services provider.It provides a web portal, search engine Yahoo Search, and rel
ool!, Yahoo Mail, Yahoo News, Yahoo Finance, Yahoo Sports and its advertising platform, Yahoo! Native.
Your input -> Details about New Begning Adoption Agency
New Beginning Adoption Agency is a fully licensed, non-profit adoption agency providing services to Idaho
crisis pregnancy services are also provided to Idaho residents. Our Wellness center is staffed with pro
milies and birth families throughout their journeys.

```

3.6. Conversation6:

```

Your input -> Hii
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporati
uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporation,Carbon
Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> I am a bot
I am a bot, powered by Rasa.
Your input -> I am sad
Here is something to cheer you up:
Image: https://i.imgur.com/nGF1K8f.jpg
Did that help you?
Your input -> I need information
What do you want to know?
Your input -> ceo of yahoo
Jim Lanzone
Your input -> fouder of airstream
Your input -> founder of Airstream
Wally Byam
Your input -> location of IBM
Armonk, New York, United States
Your input -> subsidiaries of google
YouTube, Dialogflow, Kaggle, Google AdMob, Looker, MORE

```

3.7. Conversation7:

```

Your input -> Hii
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corp
uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporation,Ca
Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> founder of safaricom
Data not found
Your input -> founder of facebook
Mark Zuckerberg
Your input -> founder of google
Larry Page and Sergey Brin
Your input -> founder of droll yankees
Peter Kilham
Your input -> founder of amazon
Jeff Bezos
Your input -> founder of flipkart
Binny Bansal, Sachin Bansal
Your input -> founder of carbon care asia
Mr Chong Chan Yau
Your input -> I need information
What do you want to know?
Your input -> I am sad

```


3.8. Conversation8:

```
Your input -> Hello
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation,co
yote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
on,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> Hello good evening
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation,co
yote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
on,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> Can you tell me something about some companies
What do you want to know?
Your input -> Where is Mozilla's headquarter located
Mountain View, California, United States
Your input -> Subsidiaries of Mozilla
Mozilla Corporation Beijing Mozilla Online Ltd MZLA Technologies Corporation
Your input -> Genmar Holdings was founded on?
1978
Your input -> Who is the founder of compaq computer corporation?
Rod Canion,Jim Harris,Bill Murto
Your input -> Who is the CEO of Droll Yankees?
Bob Donegan
Your input -> Bye
Bye
```

3.9. Conversation9:

```
Your input -> Hello
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation
uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporation,Carbon Ca
Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> Good morning
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation
uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporation,Carbon Ca
Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> Good evening
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation
uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporation,Carbon Ca
Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> tell me something about flipkart
Your input -> tell me about flipkart
Your input -> tell me details about flipkart
Flipkart is an Indian e-commerce company,the company initially focused on online book sales before expanding into oth
ies such as consumer electronics, fashion, home essentials, groceries, and lifestyle products.
Your input -> subsidiaries of flipkart
Myntra, PhonePe, Ekart, Mallers, Inc., MORE
Your input -> bye
Bye
```

3.10. Conversation10:

```
Your input -> Hi Good evening
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation,co
yote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
on,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> I want to know about safaricom
Safaricom PLC is a listed Kenyan mobile network operator headquartered at Safaricom House in Nairobi, Kenya. It is the l
argest telecommunications provider in Kenya, and one of the most profitable companies in the East and Central Africa reg
ion.
Your input -> CEO of safaricom?
Peter Ndegwa
Your input -> When was safaricom founded
1993
Your input -> subsediaries of safaricom
Data not found
Your input -> Nice bye
Bye
```

3.11. Conversation11:

```
Your input -> Hey there
I am a chat bot... I have information about safaricom,facebook,google,Droll Yankees,quickie manufacturing corporation,co
yote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
on,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> Tell me about Yahoo
Yahoo is an American web services provider.It provides a web portal, search engine Yahoo Search, and related services, i
ncluding My Yahoo!, Yahoo Mail, Yahoo News, Yahoo Finance, Yahoo Sports and its advertising platform, Yahoo! Native.
Your input -> CEO of Yahoo
Jim Lanzone
Your input -> Subsidiaries of Yahoo
Yahoo India Private Ltd, Yahoo! France SAS, Flurry, MORE
Your input -> headquarters of Yahoo
Sunnyvale, California, United States
Your input -> great! Bye
Your input -> Bye
Bye
```

3.12. Conversation12:

```
Wally Byam
Your input -> Who is the founder of IBM
Charles Ranlett Flint
Your input -> Tell me who is the CEO of TCS
Your input -> Who is the CEO of TCS
Your input -> CEO of TCS
Your input -> Tell me the Subsidiaries of TCS
Digitate, Diligenta Limited, MahaOnline Limited, MORE
Your input -> CEO of facebook
Mark Zuckerberg
Your input -> CEO of google
Sundar Pichai
Your input -> Who is CEO of Walmart
Doug McMillon
Your input -> Tell me the Subsidiaries of TCS
Digitate, Diligenta Limited, MahaOnline Limited, MORE
Your input ->
```

3.13. Conversation13:

```
Your input -> When Quickie Manufacturing Corporation was founded
1919
Your input -> Coyote Logistics's Subsidiaries
Data not found
Your input -> Where is Coyote Logistics headquarter
Chicago, Illinois, United States
Your input -> UniGroup was founded by
Data not found
Your input -> founder of AIM Your Way
Data not found
Your input -> Who is the founder of Airstream
Wally Byam
```

3.14. Conversation14:

```
2022-04-22 01:46:24 INFO root - Rasa server is up and running.
Bot loaded. Type a message and press enter (use '/stop' to exit):
Your input -> Hi
I am a chat bot... I have information about safaricom,facebook,google,Droll Yankees,quickie manufacturing corporation,coyote logistics,uniGroup,a
im your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporation,Carbon Care Asia, Flipkart,Amazon, Walmart, Yah
oo, tcs company,IBM. how may I help you?
Your input -> I need information
What do you want to know?
Your input -> Details of Airstream
Airstream's silver-bullet travel trailers have been streaming down the nation's ribbons of highways for more than 75 years and have become as com
mon and well-loved in the culture of America as blue jeans and tees. Founder Wally Byam began the enterprise in the 1920s by selling plans for bu
ilding trailers, which led to the design and launch of The Clipper in the early 1930s. The company makes travel trailers primarily, but also prod
uces its Interstate touring coach with full amenities.
Your input -> Where is Flipkart's headquarter located
Bangalore, Karnataka
Your input -> Tell me who is the CEO of Yahoo
Your input -> CEO of Yahoo
Jim Lanzone
Your input -> Bye
Bye
Your input ->
```

3.15. Conversation15:

```
Your input -> Hi
I am a chat bot... I have information about safaricom,facebook,google,Droll_Yankees,quickie manufacturing corporation,co
yote logistics,uniGroup,aim your way,New Beginning Adoption Agency,Airstream, Genmar Holdings, compaq computer corporati
on,Carbon Care Asia, Flipkart,Amazon, Walmart, Yahoo, tcs company,IBM. how may I help you?
Your input -> How are you
I am a bot, powered by Rasa.
Your input -> I need information about some companies
What do you want to know?
Your input -> Where is the headquater of TCS
Mumbai
Your input -> TCS's Subsidiaries
Digitate, Diligenta Limited, MahaOnline Limited, MORE
Your input -> Description of TCS
Tata Consultancy Services is a global leader in IT services, consulting & business solutions with a large network of inn
ovation & delivery centers.
Your input -> Who is the CEO of TCS
Your input -> Where is Amazon's headquater located
Seattle, Washington, United States
```

4. Challenges Faced:

- Since the train data was quite large it was taking a lot of time to incorporate it in the knowledge base for all the listed companies in the chatbot.
- Since a limited number of examples are given in the intent section, the chatbot was unable to classify the intents of all the similar messages properly.
- Reusability Issue: Unable to create the same set of intents for similar facts of the companies.

5.Improvements that can be done

- Knowledge base of the chatbot can be increased.
- For proper intent classification more examples can be added.
- Same structure for similar facts of the companies can be created to ensure reusability of the codes.
- More user friendly interactions can be added to train the chatbot accordingly.

6. References:

[1]<https://github.com/diffbot/knowledge-net/blob/master/README.md>

[2]<https://rasa.com/docs/rasa/>