Legal aid chatbot

-for women and children

Team Members

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Link to Download Pre Trained Wikipedia Model
https://unimelbcloud-my.sharepoint.com/:u:/g/personal/jeyhan_lau_unimelb_edu_au/EVvPGioXZVNEnOG9HgIlTQUBexazclI5x-KBs5F-ZbcBlw?e=5Dcs6B

Introduction

This legal aid chatbot is designed to help women and children who are victims of domestic violence and cyber crime.

What's a need of this kind of chatbot?

1. Domestic violence and Cyber Crime complaints rates are at all time high
2. Despite increasing complaints rates, there are lot of cases unreported due to social taboo.
3. **This chatbot aims to help women and children who are afraid of judgemental society.**

Type of violence	Never told anyone	Told someone	Sought help from a source
Physical	79.5	9.0	11.6
Sexual	80.6	9.5	9.8
Physical & sexual	61.3	9.9	28.8
Total	**76.6**	**9.1**	**14.3**

Lack of Awareness of laws

Ankita*, 19, a resident of Ashok Vihar in North West Delhi, had been **trolled violently** five years ago for a **Facebook post** critical of the government. But she did not report the **harassment**, she said because she had **no idea** how to.

"One of the biggest problems in reporting cyber bullying is that a large number of vulnerable victims don't even recognise that what is happening to them is bullying,"
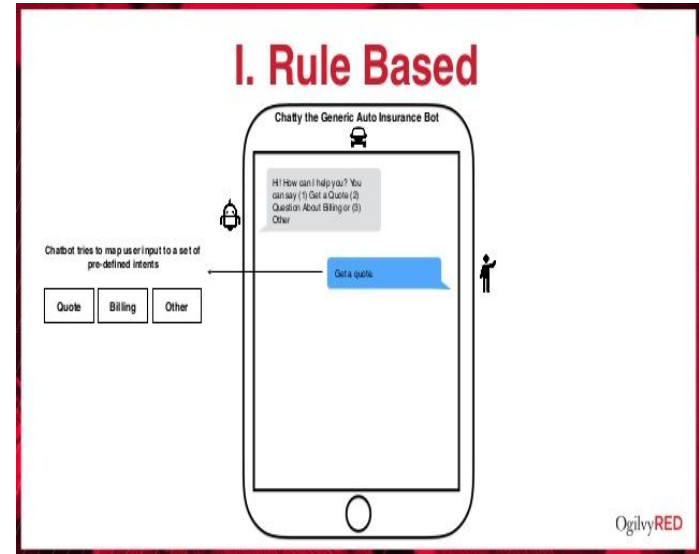
------references

(https://scroll.in/article/956085/in-one-year-alone-cyberbullying-of-indian-women-and-teenagers-rose-by-36)

Rule based chatbot

This is a Rule based chatbot

Why not AI based?

- We do not have enough relevant data on cybercrime and domestic violence

I. Rule Based

Chatty the Generic Auto Insurance Bot

Hi! How can I help you? You can say (1) Get a Quote (2) Question About Billing or (3) Other

Get a quote

Chatbot tries to map user input to a set of pre-defined intents
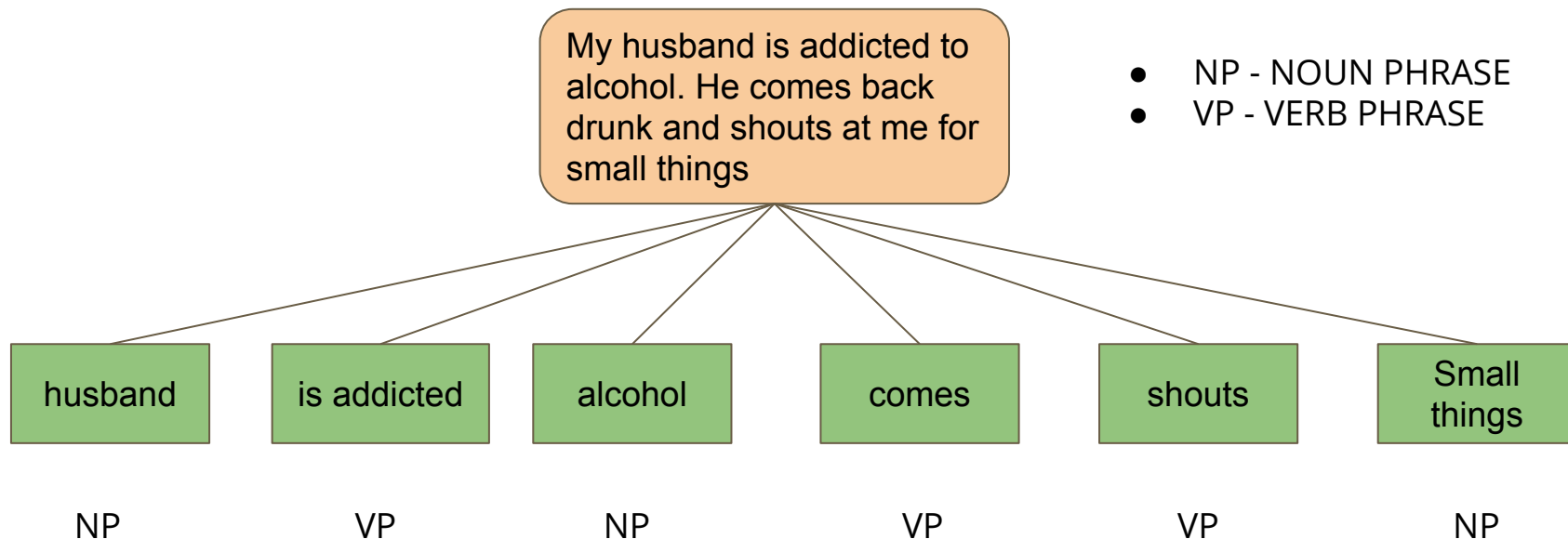
Quote | Billing | Other

OgilvyRED

Task Addressed

In the course of the implementation of the ChatBot we address a wide variety of tasks that include:
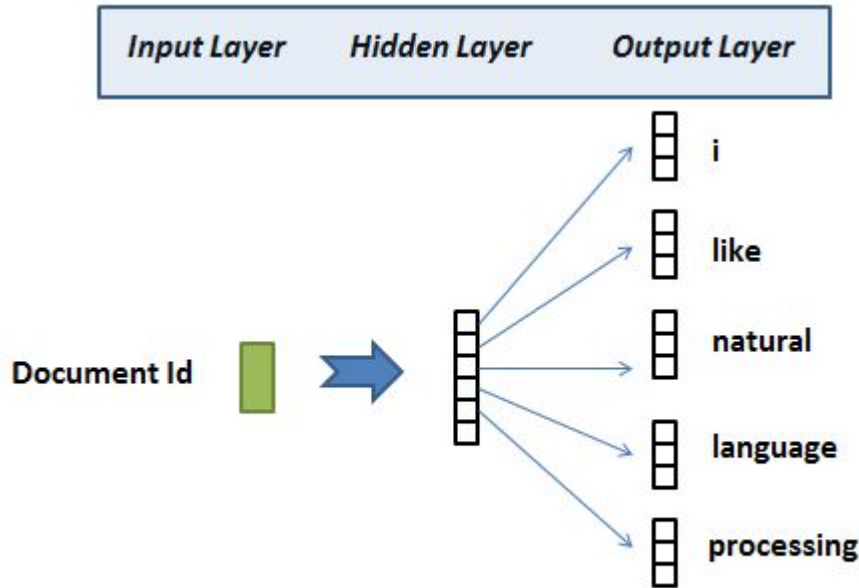
1. Extracting the noun and verb phrases from the user text
2. Finding the similarity between intents and phrases
3. Matching intents to relevant sections of Domestic Violence Act 2005, IT Act 2000 and Indian Penal Code
4. Asking relevant questions which are related to user context and required for various sections to apply
5. Maintaining the order of questions need to asked. All related questions are asked in a sequential order one after another

Extracting the noun and verb phrases from User text

My husband is addicted to alcohol. He comes back drunk and shouts at me for small things

- NP - NOUN PHRASE
- VP - VERB PHRASE

husband	is addicted	alcohol	comes	shouts	Small things
NP	VP	NP	VP	VP	NP

Doc2Vec DBOW Model

Distributed Bag of Words Model

Distributed Bag of Words (DBOW) takes the document ID (Paragraph ID) as the input and tries to predict randomly sampled words from the document.

To identify the intents we are using Doc2vec model trained on WIkipedia data.

Similarity between intent and phrases

1. Converting both phrases and intents to vector form using Doc2vec
2. Finding cosine similarity between 2 vectors

$$\cos\theta = \frac{\mathbf{a} \cdot \mathbf{b}}{\|\mathbf{a}\| \, \|\mathbf{b}\|}$$

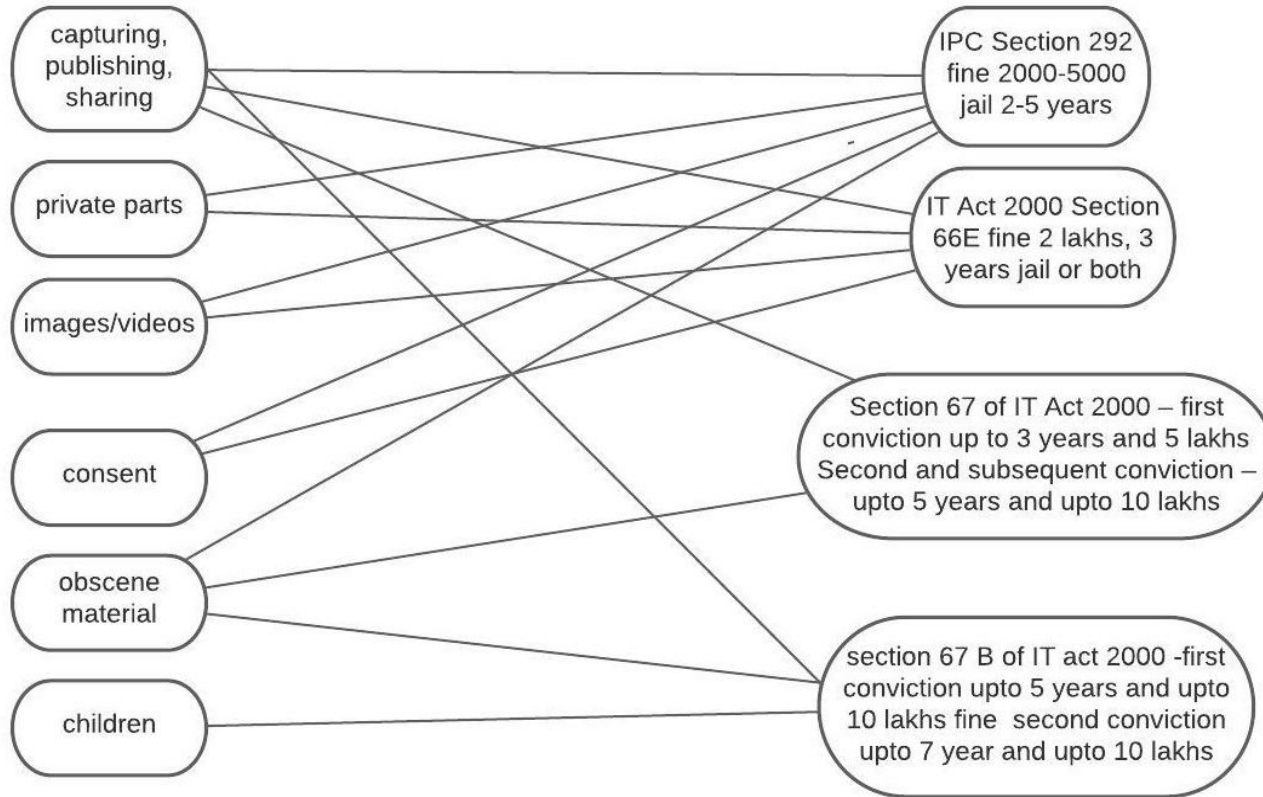Here a is vector of intent and b is a vector of phrases

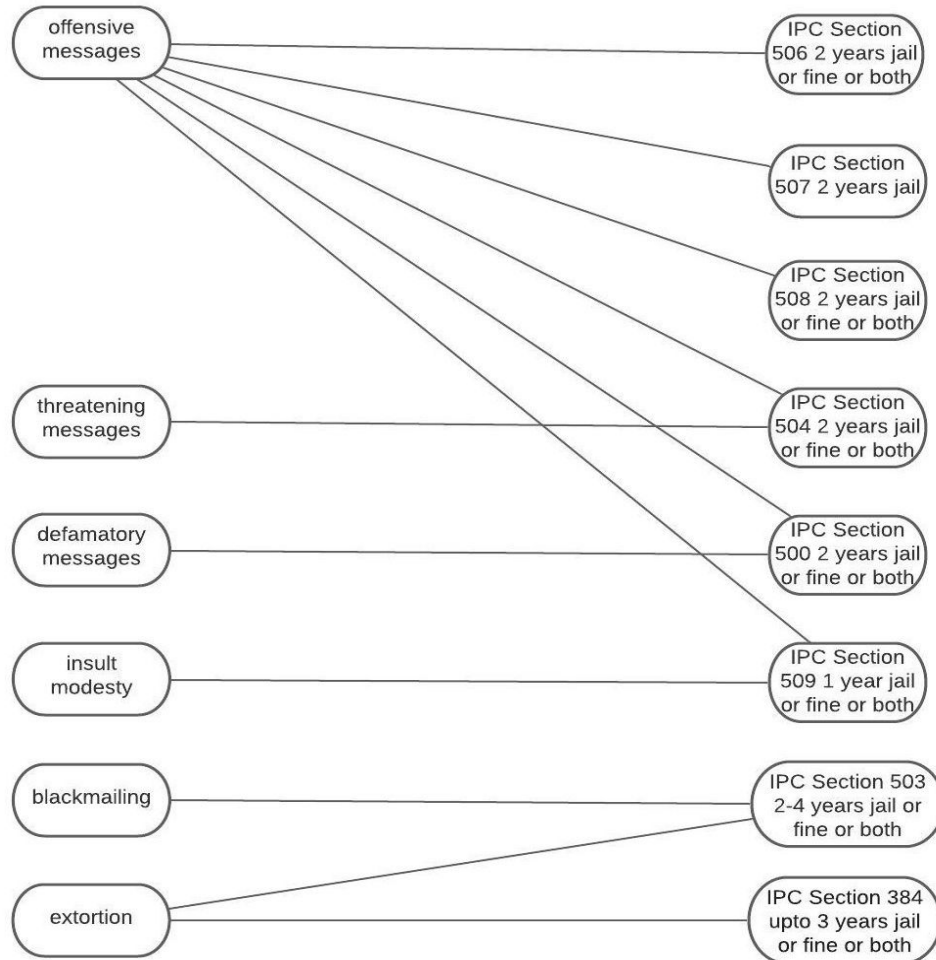We have assumed that both intent and phrase as documents.
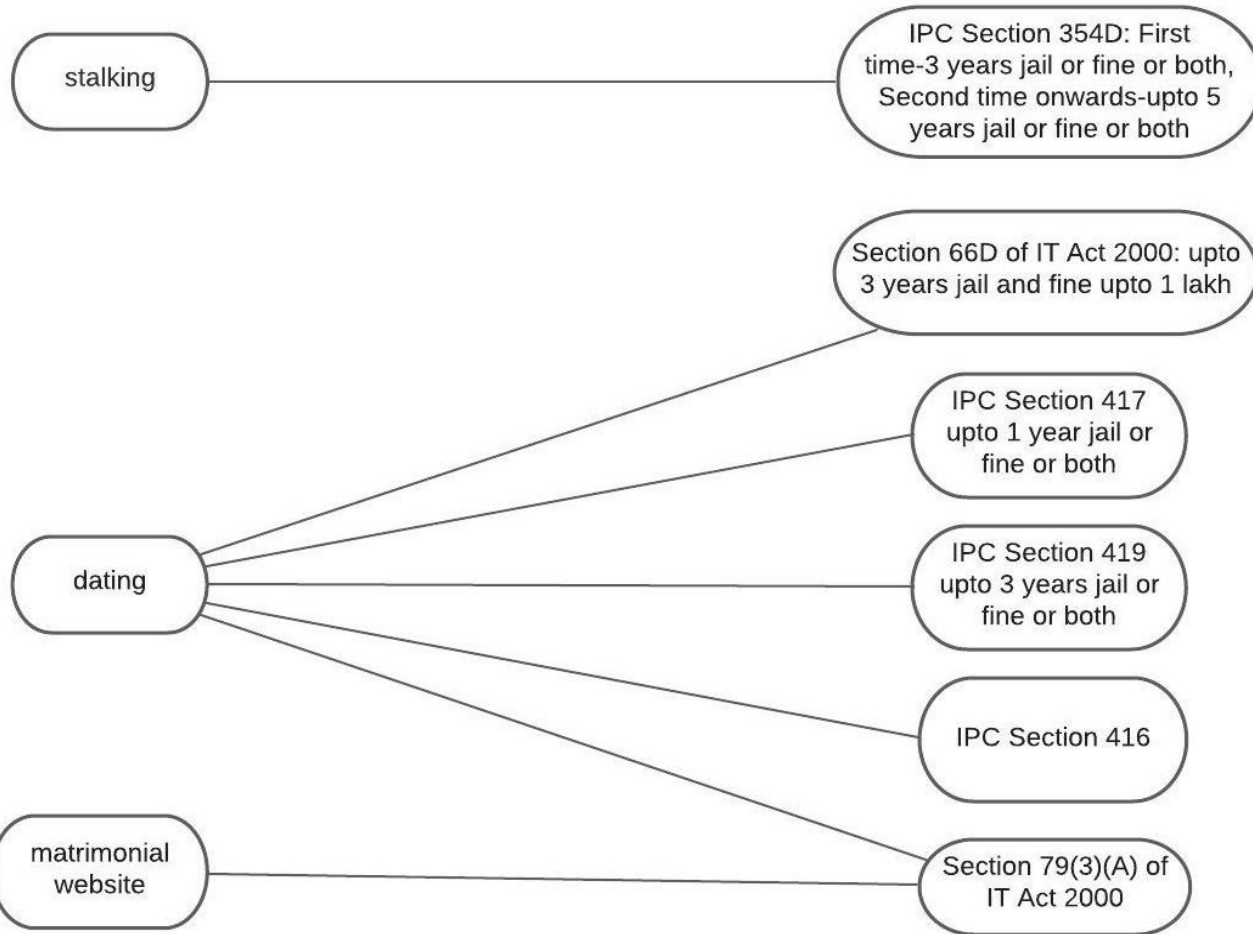
Matching intents to relevant sections

From the intents we get from user input, it's matched to relevant sections under

1. Domestic Violence Act 2005
2. IT Act 2000
3. Indian Penal Code sections related to Domestic Violence and Cyber crime

Cyber Crime Intents and Relevant Sections

capturing, publishing, sharing

private parts

images/videos

consent

obscene material

children

IPC Section 292
fine 2000-5000
jail 2-5 years

IT Act 2000 Section 66E fine 2 lakhs, 3 years jail or both

Section 67 of IT Act 2000 – first conviction up to 3 years and 5 lakhs Second and subsequent conviction – upto 5 years and upto 10 lakhs

section 67 B of IT act 2000 -first conviction upto 5 years and upto 10 lakhs fine second conviction upto 7 year and upto 10 lakhs

offensive messages
threatening messages
defamatory messages
insult modesty
blackmailing
extortion

IPC Section 506 2 years jail or fine or both

IPC Section 507 2 years jail

IPC Section 508 2 years jail or fine or both

IPC Section 504 2 years jail or fine or both

IPC Section 500 2 years jail or fine or both

IPC Section 509 1 year jail or fine or both

IPC Section 503 2-4 years jail or fine or both

IPC Section 384 upto 3 years jail or fine or both

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stalking ———————————— IPC Section 354D: First
                       time-3 years jail or fine or both,
                       Second time onwards-upto 5
                       years jail or fine or both

                       Section 66D of IT Act 2000: upto
                       3 years jail and fine upto 1 lakh

                       IPC Section 417
                       upto 1 year jail or
                       fine or both

dating                 IPC Section 419
                       upto 3 years jail or
                       fine or both

                       IPC Section 416

matrimonial            Section 79(3)(A) of
website                IT Act 2000
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Domestic Violence Intents and Relevant Sections

Asking relevant questions

My husband is addicted to alcohol. He comes back drunk and shouts at me for small things

Extracting Noun and Verb Phrases

Alcohol addiction

Verbal abuse

Physical abuse

Verbal abuse

Have you ever been abused physically like beating, hitting etc.. by your family members?

Already Matched Intent

Algorithm

01 Identification of intents by similarity check
- We extract verb and noun phrases from the user response
- We will find similarity of each phrase with all intents
- Intents whose similarity is greater than threshold will go through other steps in this processing

02 Asking question on related intents
- Create an empty deque
- append the intents present in ordering dictionary if the identified intent is present in it
- Asking question on those intents

03 Identification of missing intents
- Identify all sections that are connected to this intent
- Do reverse mapping and get the intent of which question needs to be asked add them to deque
- Now process the elements in deque one by one

04 Asking questions on missing intents
- Ask the question of the intent in deque
- For every intent there will be one question that will asked if that intent is missing
- Process the response of user for that question

05 Marking intents according to user response
- If response for a question is no then mark all related questions as asked
- Mark the intent as present if yes and question along with related intents and respective questions
- Loop until all related questions asked.

06 Identification of all application sections
- From the intents which are true identifying the sections under which user should probably file a case.

Cyber Crime Testcase

Example: Someone had created a website like Facebook by the name "Kochusundarikal" depicting pornographic pictures of minor girls along with others like me, with abusive and sexual comments and made wide circulation in social network and made advertisements through the Internet.

In this case we have following matchings:

- pornographic pictures - obscene content
- Minor girls - children

So as all the intents of Section 292, Section 66E, Section 67, Section 67B are matched. So no question is asked.

SAKHA: What brings you here. How can I help you?
YOU: Someone had created a website like Facebook by the name "Koch usundarikal" depicting pornographic pictures of minor girls along with others like me, with abusive and sexual comments and made wide circulation in social network and made advertisements through the Internet.

SAKHA: Do you want to share anything else?
YOU: no

SAKHA: You may file a case under the following sections:

YOU: no

SAKHA: You may file a case under the following sections:

  * IPC Section 292 fine 2000-5000 jail 2-5 years
  * IPC Section 354A upto 3 years jail or fine or both
  * Section 66E of IT Act 2000: fine 2 lakhs, 3 years jail or both
  * Section 67 of IT Act 2000 – first conviction up to 3 years and 5 lakhs Second and subsequent conviction – upto 5 years and upto 10 lakhs
  * section 67 B of IT act 2000 - first conviction upto 5 years and upto 10 lakhs fine second conviction upto 7 year and upto 10 lakhs

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Domestic violence Testcase

SAKHA: Hi, I am Sakha, and what is your name ?
YOU: sita

SAKHA: What is your age?
YOU: 30

SAKHA: Are you married?
YOU: yes

SAKHA: Do you do some kind of work for living?
YOU: yes

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SAKHA: Do you do some kind of work for living?
YOU: yes

SAKHA: What brings you here. How can I help you?
YOU: My husband want money for drinking alcohol everyday but does not do any work he come home and snatches away my daily earning and also he will beat and shouts unneccessary if i don't give him money

SAKHA: Do you face any restrictions on personal matters from your family members?
YOU: no i have not faced any such restrictions

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Type here to search

01:08 PM
07-01-2021

SAKHA: Did they abuse you verbally like speaking ill of you or any of your family members?
YOU: yes

SAKHA: Does any of your family members trying to threaten you by any action or gesture ?
YOU: no

SAKHA: Did your family members evicted you from home anytime?
YOU: no

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Clear Chat

meet.google.com is sharing your screen. **Stop sharing** Hide

Type here to search

ENG

01:08 PM
07-01-2021

SAKHA: Did anyone of your family members try to take away your income?
YOU: yes

SAKHA: Are your basic needs being fulfilled by your family members?
YOU: yes

SAKHA: Do you want to share anything else?
YOU: no

SAKHA: You may file a case under the following sections:

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Clear Chat

meet.google.com is sharing your screen.   Stop sharing   Hide

YOU: yes

SAKHA: Do you want to share anything else?
YOU: no

SAKHA: You may file a case under the following sections:

 * Section 3 of Domestic violence Act under economic abuse
 * Section 3 of Domestic violence Act under verbal abuse
 * Section 3 of Domestic violence Act under emotional abuse
 * Section 3 of Domestic violence Act under physical abuse

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meet.google.com is sharing your screen.   **Stop sharing**   Hide   Clear Chat
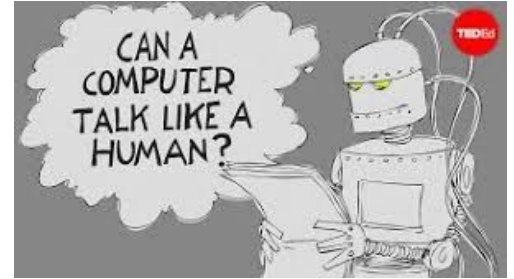
What we tried to achieve :

- Human like conversation
- Asking relevant questions
- User friendly

What problems we have faced

- Relevant data problem
- Faced lot of difficulties to make it more human like
- Legal understanding

THANK YOU