

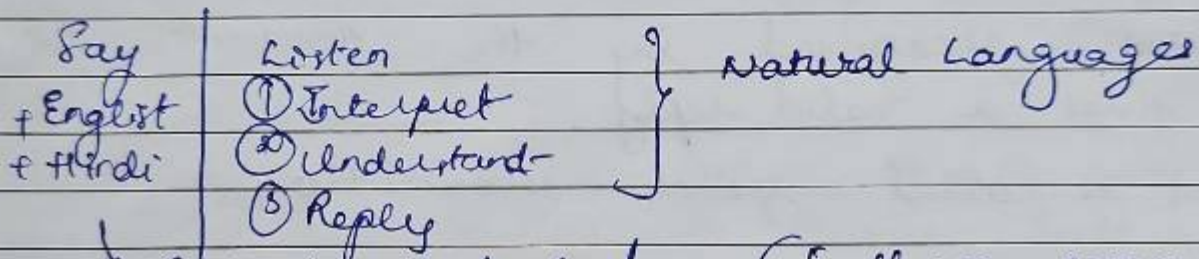
★ Natural language processing (NLP)

NLP \Rightarrow most important & latest topic of
AI

+ have examples given

NLP ? Definition

\Rightarrow How do human beings communicate with each other



\hookrightarrow Reply is understood (Full way communication)

\Rightarrow This makes human behaviour intelligent.

\Rightarrow Computer should replicate above same thing.

\Rightarrow M/c \leftrightarrow human being communicate the same above way which is done by 2 human beings.

Applications of NLP

- ① \Rightarrow Speech Recognition
- ② \Rightarrow Sentiment Analysis
- ③ \Rightarrow Machine Translations
- ④ \Rightarrow Chatbots etc.

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① Widely used, mostly research work done is this

→ Appⁿ:- Google Assistant (Google)
Apple 'Siri'

→ English, Hindi Question asked, speech ~~record~~ recognised by the Assistant & gives a valid reply.
This is called speech recognition.

② S. A.

- In social media, FB, Twitter
- Tweets analysed & check whether they are good or bad.
Similar to movie ratings.
- We can also pick tweet of a leader & check on which major focus is there.

{ Sentiments, means tweets are good or bad. }

→ In Python + Tensorflow, using R programming we can analyze, Pick tweets & analyze them, word cloud is made to check whether the leader is focusing on what topic in

③ M/c Translation:

- Google Translate (e.g.)
- I don't know Chinese, Bengali
- For eg. we copy it & put in Google & understand it
Same way we reply then in same language.
- Machine as it applies to the user in this rather than an human interpreter who might make mistakes.
(avoidable has to be trained)

(4) Chatbots.

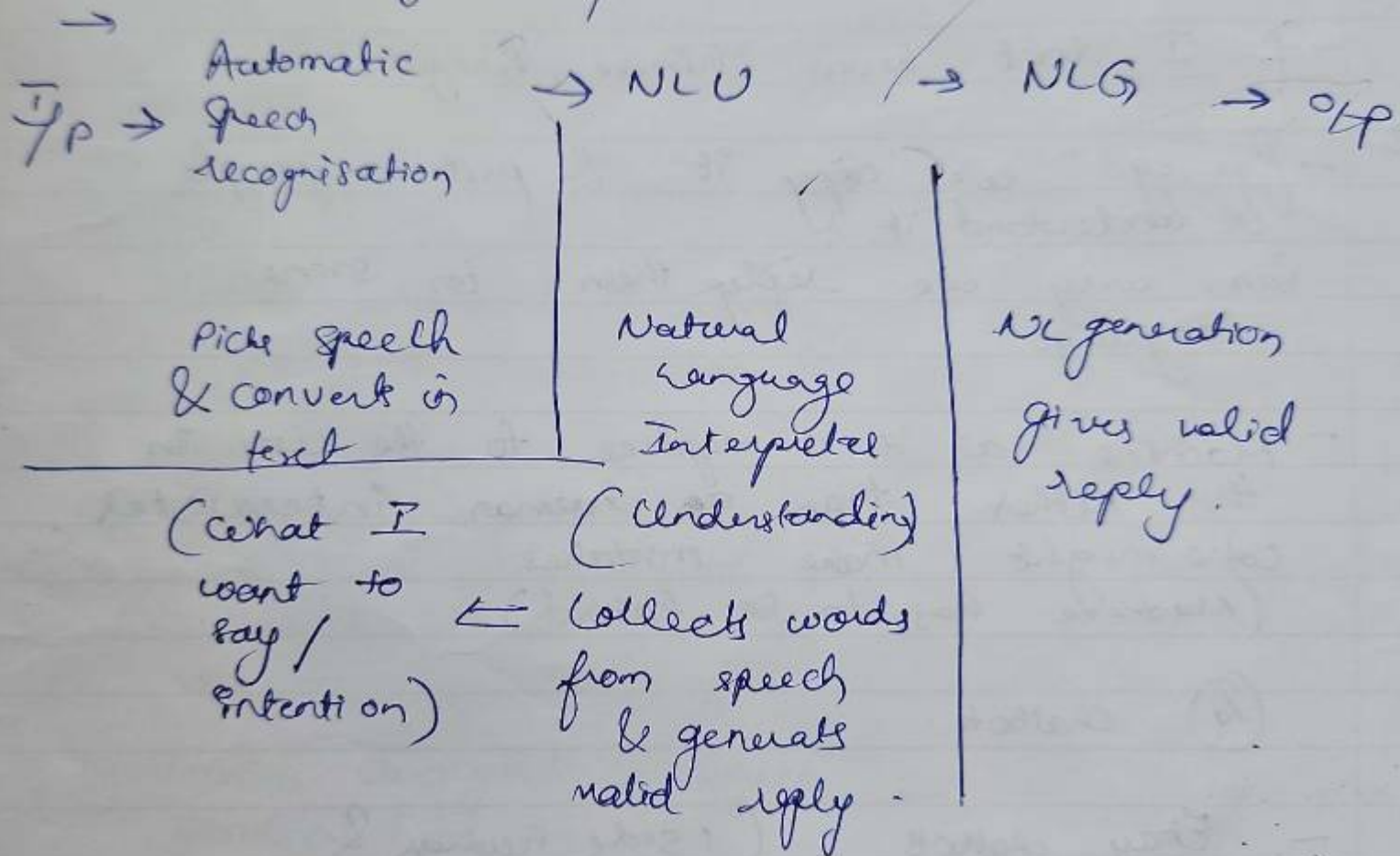
- Easy chatbots (1 side human & 1 chatbot human)
- Smart chatbot.
↳ I asked, m/c replied with ans from huge database.

eg. Advertisement material gives recommendations based on history

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Another eg,
→ Spellchecks, gives error from spellings
in text / speech.

④ Above diagram explanation :-



eg: - talk with Google Assistant.

NLU → what do the user say?
their intent! Meaning?

Challenges → { Ambiguity }

similar
lots of words \rightarrow lots of "ambiguity" \star
for NLP sys.

- ① Lexical ambiguity
- ② Syntactic ambiguity
- ③ Semantic
- ④ Pragmatic

\leftarrow Compiler's work

① The words 'How are you'
is tokenised,
 \rightarrow divided into different words.
converted.

\rightarrow 1 word \rightarrow multiple meanings.

\rightarrow e.g. The tank was full of water.

Tank filled in house / or Any tank.

\rightarrow word to be identified as per
context of the sentence.

② Structure of sentence should be
valid during passing of sentence

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→ Old man & woman were taken to safe place

can be { old man or old woman
or old man & woman

→ Humans identify according to intuitions & sentiments

that, it can be either or or

→ M/c cant, has to be artificially intelligent

→ ∴ We have to properly give the start to m/c, i.e.

→ Old man & old woman were taken to safe place.

③ Semantic Ambiguity.

— What is its meaning?

→ Car hit the pole while it was moving.

Car is moving / or pole is moving.

∴ There is ambiguity.

(Tokenize & parse)

Tokenization, Stemming, Name Entity Relation
{ Noun + Verb + Adverb + Adjective }

Divide & find context of sentence & its words.

④ Pragmatic

- Context of the phrase has multiple interpretations (meanings)
- eg The police are coming.
- Human beings use \rightarrow past exp, sentiment, intuition
- M/c can identify & remove ambiguity. we use "NLU"

* NLG

\rightarrow Replies has to be Intelligent & Conversational.

eg google assist. asked Tell me the nearby places to eat

Nearby places for clothes shopping.
Reply is not valid.

\rightarrow we do Text / sentence planning.

From "Corpus", Entire db we check / plan text / words from db. , on basis of this we plan sentences, then we plan structure, so we work on structure data

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Corpus \rightarrow a collection of written or spoken texts

→ Deal with structured data reply

eg.
What will be the weather in
next week?

Reply ⇒ We get a summarised reply which
is valid for the Q. asked. in structured
form.

⇒ So, the User that has asked the question,
should get a relevant reply.
