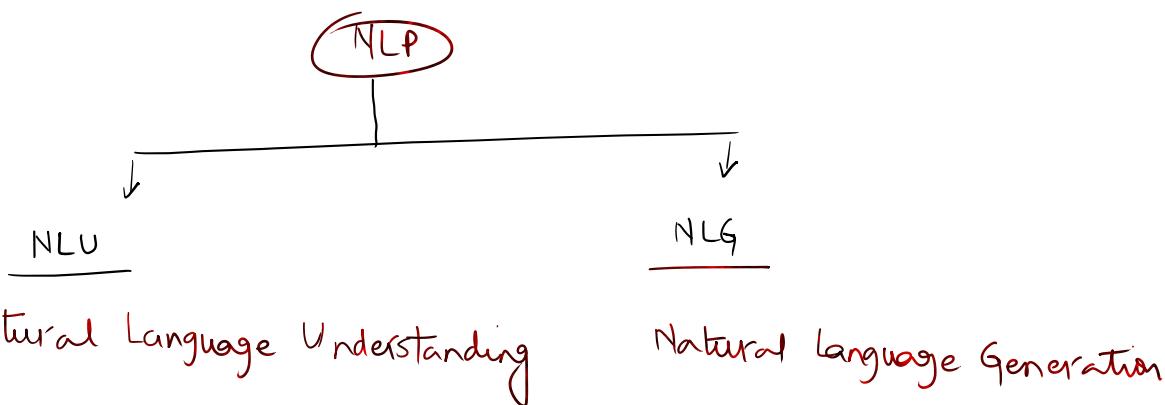


What is NLP?



NLP → is a branch of AI that enables machines to
understand, interpret, and generate human language.

① ② ③

→

Key goals: NLP powers many real-world applications and continues to shape the future of AI

- Transforms unstructured human language into vector representation machine-readable data.
- Enables computers to interact with humans using natural language.

Pro-tip: Difference b/w between NLP, NLU & NLG

NLU: Natural Language Understanding

NLU: is a subset of NLP which focuses on comprehensive aspect of human language - extracting meaning, intent and entities from unstructured text.



NER: Named Entity Recognition

NER: Named Entity Recognition

NLG: stands for natural language generation which focuses on ~~creating/generating~~ human-like text from ~~structured or unstructured data~~.

Example #1

Book a flight to Delhi tomorrow

→ NLP: preprocesses the user's input

- word tokenization
- stop words removal
- stemming vs lemmatization

→ NLU: understands the intent → Book a flight.

extracts the entities → Location
origin
destination
Date
Time
Person Travelling

→ NLG: "sure, booking a flight to Delhi from BLR tomorrow".
What time do you prefer?

OCR

What's this news?

Analysis ▾

The news is about **extensive flight cancellations by IndiGo**.

Key points from the article are:

- **Nearly 300 IndiGo flights** have been cancelled across major Indian airports, including **Delhi, Mumbai, Pune, and Hyderabad**, due to an ongoing **operational crisis** at the airline.
- The chaos resulting from the disruptions is continuing.
- The **DGCA** (Directorate General of Civil Aviation) has set up a **four-member panel** to probe

OCR: optical character Recognition

(apc) - in 2015 → writing ocr code using package called
'Tesseract'
↓
OCR engine in R-programming.

This is a lot of 12 point text to test the ocr code and see if it works on all types of file format.

The quick brown dog jumped over the lazy fox. The quick brown dog jumped over the lazy fox. The quick brown dog jumped over the lazy fox. The quick brown dog jumped over the lazy fox.

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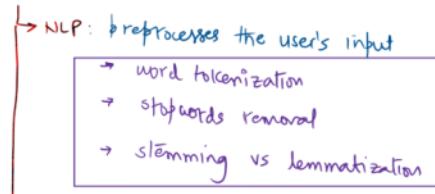
Extract the text

Analysis

ocr

extracted Text

↳ LLMs based model(s) can extract text from handwritten images



extract the image

Analysis

The image shows handwritten notes about **NLP (Natural Language Processing)** and the pre-processing steps involved with user input.

The main points are:

- **NLP: pre-processes the user's input**
- The pre-processing steps listed are:
 - **Word tokenization**
 - **Stopwords removal**
 - **Stemming vs lemmatization**

Applications:

① chatbots and virtual assistants

- understands common users' queries using NLP and generates human-like responses using rules or heuristics techniques

→ Provides customer support automation

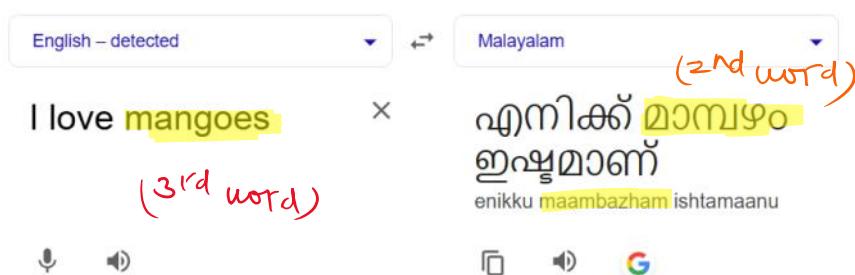
e.g., (bank chatbots)

Impact: Reduces the customer service costs, enhances user-experiences

② Machine Translation

Google translate, Meta AI translation

- uses neural machine translation (NMT) to translate between languages



- preserves the content, grammar and meaning using transformer based models.

③ Sentiment Analysis

- analyzes the customers' feedbacks, tweets, reviews etc. and detect positive, negative or neutral emotions
- helps business understand public opinion or customer sentiments

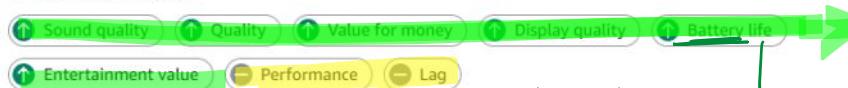
Examples: Brand position monitoring, stock market analysis, political sentiment tracking

Customers say

Customers praise the tablet's 2K display with crystal-clear visuals and excellent sound quality, particularly appreciating the built-in JBL speakers. The device offers good value for money, with a battery that lasts up to 2 days on a full charge, and customers find it perfect for browsing and entertainment. While some customers report smooth performance, others mention display issues within a month of use, and while the processor receives positive feedback, some find it slow.

ai Generated from the text of customer reviews

Select to learn more



Neutral

Summary of all
the reviews



Most of the buyers are happy with the battery life

Customers say

Customers find the iPad case has a good fit. However, the quality and sturdiness receive mixed feedback, with several customers reporting that the case broke into pieces. Customers also disagree on the value for money.

ai Generated from the text of customer reviews

Select to learn more



Impact: Brand optimizes marketing strategies,

Brand improvises on product features,

Predict trends, and

Manage reputation

④ Text Summarization

6 Microsoft Teams Copilot

- listens to your meetings
- and generates meeting notes
- list action items
- answers queries about on-going meeting

7 Inshorts

- summarizes long news in less than 4-5 lines

8 Podcasts / Reading a book

- can be summarized

Google NotebookLM



Google NotebookLM

<https://www.notebooklm.google>

⋮

Google NotebookLM

NotebookLM Understand Anything — NotebookLM: A powerful AI tool for students, researchers, & professionals. Understand complex...

NotebookLM: Personalized AI



NotebookLM: Your AI research and writing partner.

<https://notebooklm.google.com/notebook/662d7419-235e-4154-9400-c966fbba0aac>

Google News

Your briefing

Saturday 6 December

Top stories >

(News Aggregation)

Russian President Vladimir Putin's India visit >



India–Russia Summit: Carpool moment with PM Modi, banquet dinner & big trade...

1 hour ago

The Hindu ✓

India, Russia agree on Arctic and nuclear cooperation

14 hours ago • By jacob koshy

NDTV ✓

Opinion: Opinion | Navigating the Tightrope: Why Putin's Visit Is A Masterclass In India's Foreign Policy

1 hour ago • Opinion • By Shashi Tharoor

India Today ✓

Putin's Bihar MLA: Meet Abhay Kumar Singh who added Indian tadka to Russian polls

3 hours ago

aggregating similar news and get it grouped like a newstand.



"Newspaper stand"

⑤ Speech to Text (STT) and Text to speech (TTS)

cisco cc: closed captions

APC: So what's happening in real time, I don't know if you're able to see this caption or not, but what it does, it is converting my speech to text. That's how you see on all the YouTube videos, on the podcasts, right? When someone is talking, right?

↳ YouTube captions ↳

↳ YouTube subtitles (cc: closed captions)
→ converts spoken words (speech) into text] STT

Reading text aloud using synthetic voices (TTS)

outlook → (read aloud)
adobe pdfs

Impact: Helps in voice assistants, accessibility for disabled users
and voice search

<https://neuralink.com/>