**What is coreference resolution?**

# Coreference Resolution:

Coreference resolution (CR) is the task of finding all linguistic expressions (called mentions) in a given text that refer to the same real-world entity. After finding and grouping these mentions we can resolve them by replacing, as stated above, pronouns with noun phrases.

## Example:

“**I** voted for **Imran Khan** because **he** was most aligned with **my** values”, **Usama** said.

“**Usama** voted for **Imran Khan** because **Imran Khan** was most aligned with **Usama’s** values”, **Usama** said.

Coreference resolution is an exceptionally versatile tool and can be applied to a variety of NLP tasks such as text understanding, information extraction, machine translation, sentiment analysis, or document summarization. It is a great way to obtain unambiguous sentences which can be much more easily understood by computers.

**How it works?**

# Example:

The first step in order to apply coreference resolution is to decide whether we would like to work with single words/tokens or spans.

But what exactly is a span? It’s most often the case that what we want to swap or what we are swapping for is not a single word but multiple adjacent tokens. Therefore, span is a whole expression. Another name for it you may come across is a mention. They are often used interchangeably.

## Before Coreference Resolution: (English)

**“Ali Ahmed, Patient with Hepatitis**, fallen from 6th floor, as **the 68-year-old** became the weak day by day. It is widely known that **he** is one of the richest people in the town.**”**

Here we have spans like “he” that have only a single token in them, but we also see the span “Ali Ahmed, Patient with Hepatitis” consisting of six consecutive words.

As a result, we obtained a text without any pronouns while still being valid grammatically and semantically.

## After Coreference Resolution:

**“Ali Ahmed, a Patient with Hepatitis**, fell from the 6th floor, as **Ali Ahmed, a Patient of Hepatitis** became weak day by day. It is widely known that **Ali Ahmed, a Patient with Hepatitis** is one of the richest people in the town.**”**

## Before Coreference Resolution: (Urdu)

**ہیپاٹائٹس کا مریض علی احمد** چھٹی منزل سے گر گیا، **68 سالہ بوڑھا** دن بدن کمزور ہوتا جا رہا تھا۔ یہ بڑے پیمانے پر جانا جاتا ہے کہ **وہ** شہر کے امیر ترین لوگوں میں سے ایک ہے۔

## After Coreference Resolution:

**ہیپاٹائٹس کا مریض علی احمد** چھٹی منزل سے گر گیا، **علی احمد ہیپاٹائٹس کا مریض** دن بدن کمزور ہوتا گیا۔ یہ بات مشہور ہے کہ **ہیپاٹائٹس کا مریض علی احمد** شہر کے امیر ترین لوگوں میں سے ایک ہے۔