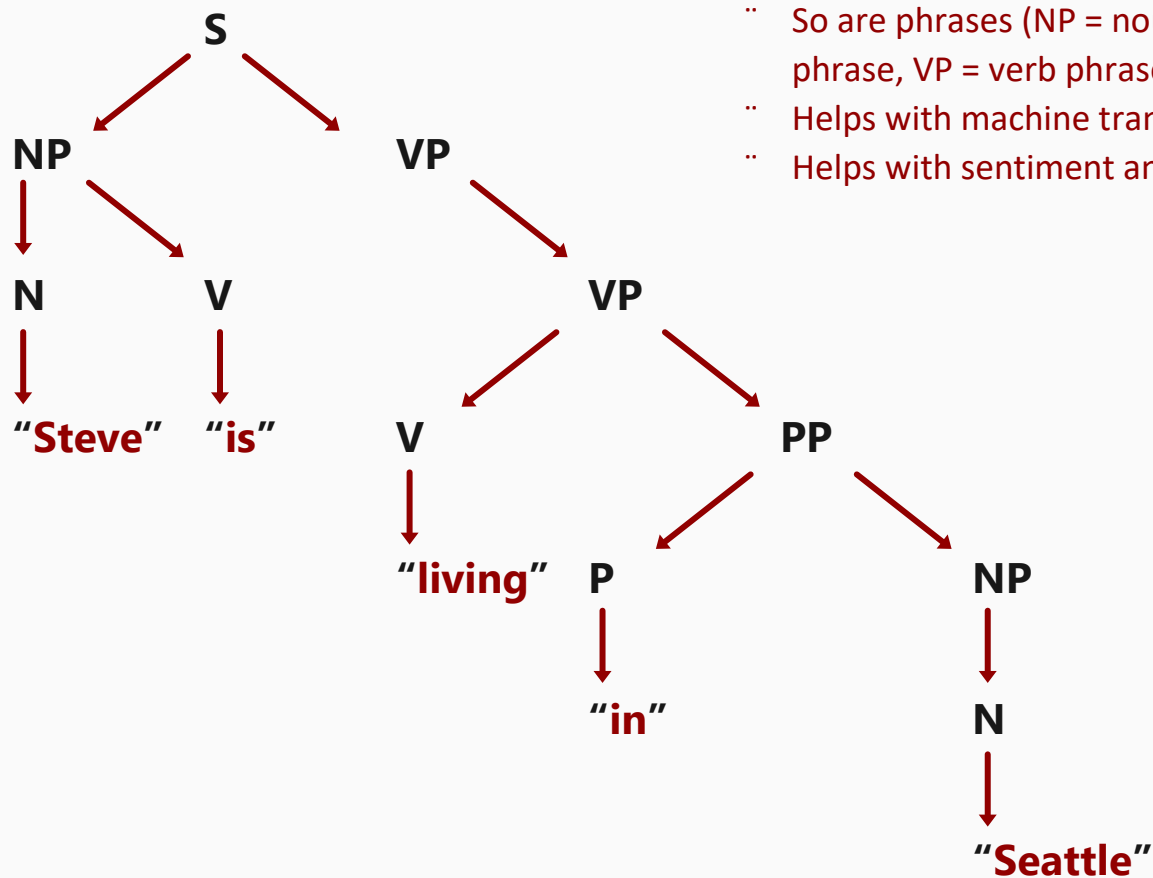## Parsing

Parsing is another subfield of Natural Language Processing (NLP)

The goal in Parsing is to produce a **Parse Tree**, which provides a structure to the sentence.

A **Parse Tree** includes the information about parts of speech:

"Steve is living in Seattle"

¨ Parts of Speech are included
¨ So are phrases (NP = noun phrase, VP = verb phrase)
¨ Helps with machine translation
¨ Helps with sentiment analysis

The above **Parse Tree** contains phrases in the form of:

¨ noun phases → "Steve"
¨ verb phrases → "living in Seattle"

Parsing is helpful in machine translation between languages by helping in determining order.

Parsing also helps with **Sentiment Analysis** by adding context to the words in a sentence.

Sentiment Analysis

Sentiment Analysis is another subfield of NLP attributing positive and negative attributes to examples. Take the following sentence for example:

- ¨ "Why don't customers like our product?"

Tweets utilizes words such as "slow, hideous, lousy, awful, and wasteful"
Competitors' Tweets use words such as: "awesome, best, cool, fun, loved it"
Although seemingly obvious, **Sentiment Analysis** is difficult to apply in practice:

5 stars: "This product is a crazy idea. I can't believe I'm actually writing a review of it, I originally thought the idea was terrible, but it's actually very nice. It allows you to blow lots of bubbles really slowly, so the whole yard is filled with bubbles of all sizes. I ended up totally going for it!

1 star: "I tried this and didn't have much luck getting it to work. Yesterday I bought a different bubble machine, and it was great, the bubbles came out really fast, and the setup was easy and fun. I loved that one, so I don't recommend purchasing this."

Various usage of positive and negative words could contradict the actual sentiment as seen above.

Sentiment Analysis can use **supervised learning** if a labeled corpus of text is available to learn from.

A classification of positive and negative sentiment might compose a feature such as:

- ¨ Average sentiment of the words in the full review.

  "I tried this a couple of times and really liked it. The setup was difficult and annoying, but when I finally got it assembled the bubbles were totally awesome. I would definitely recommend this product."

- ¨ Average sentiment of single words that reference the product.

  "The bubble blower is so awesome…"

  "…nevermind that. Let's discuss the bubble blower, which has worked out great so far…"

Parse Trees can handle the features illustrated above.