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Week 4: Text Analytics

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Questions and Answers

- Please post questions about:
  - Lecture videos
  - Labs
  - This session…
- Post to:
  - Teams QA channel
  - Blackboard discussion forum (anonymous)

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Introduction

Why does text require specialised methods?

- Please post answers to Padlet: https://uob.padlet.org/edwinsimpson/khs5rhkbpco7kdtk

What Makes Text Special?

- Text data is **discrete.** Discrete units are combined in sequences to form meaning.
- Many observations are **rare**, many possible sentences are never observed in any given dataset.
- Text is **compositional:** words combine into phrases, which combine to form sentences, and so on.
- Ambiguity, errors and variations in the way people use language also present major challenges.

Ways to View Meaning in Language

Umashanthi interviewed Ana. She works for the college newspaper.

- Relational
  - Relationships between words represent meaning
  - E.g., synonyms, categories, …
- Compositional
  - The meaning of larger units is formed by combining smaller units
  - E.g., sentences from phrases, words from suffixes, prefixes and stems
- Contextual (or ‘distributional’)
  - We can understand a word from its context
  - The context of a word alters its meaning

Ethical Considerations

- Give some examples of ethical considerations when building a text analytics system.

- Please post answers on Padlet: https://uob.padlet.org/edwinsimpson/khs5rhkbpco7kdtk

Ethical Considerations

- Privacy and freedom of speech: whose data are we processing, and does doing so restrict their privacy or freedom?
- Labour: who created the data that we’re using and do they benefit from our technology?
- Bias: technology can amplify societal biases, so have we done enough to identify and address potential problems? Do we serve different communities (e.g., speakers of different languages) equally?

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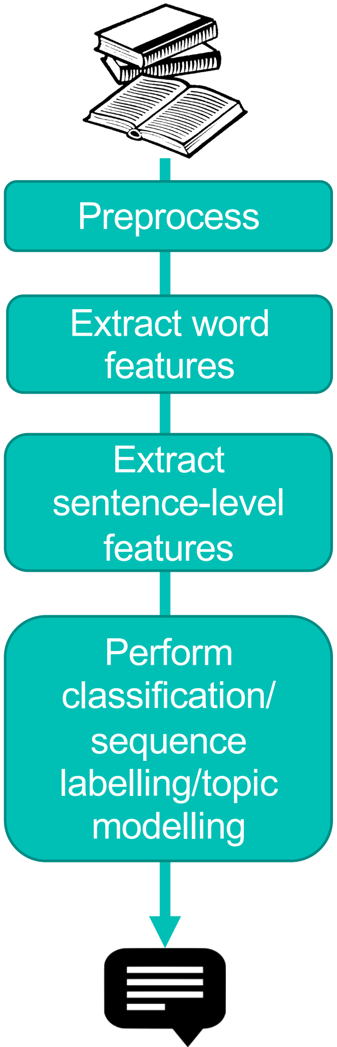
Regular Expressions

Regular Expressions

- How can we use regular expressions in Text Analytics?
- Where in the pipeline does it fit?

- Write answers on the Padlet: https://uob.padlet.org/edwinsimpson/khs5rhkbpco7kdtk



Preprocess

Extract word features

Extract sentence-level features

Perform classification/ sequence labelling/topic modelling

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Text Normalisation

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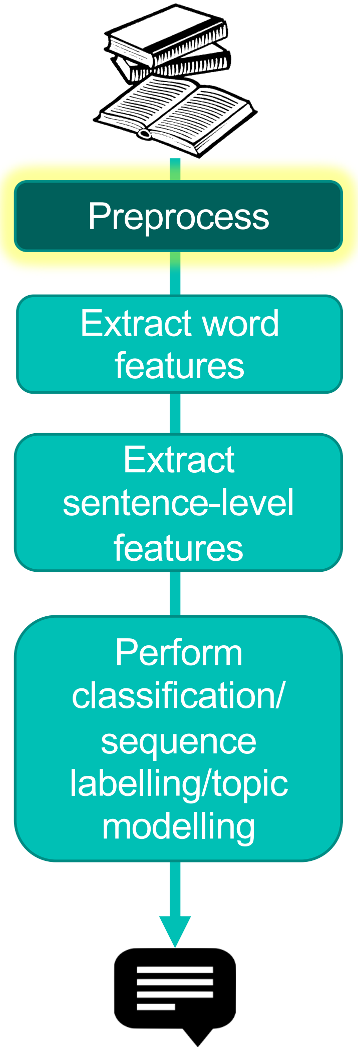
Text Normalisation

- Most text processing methods require us to normalise the text first as a preprocessing step.
- Typical steps are…?



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Text Normalisation

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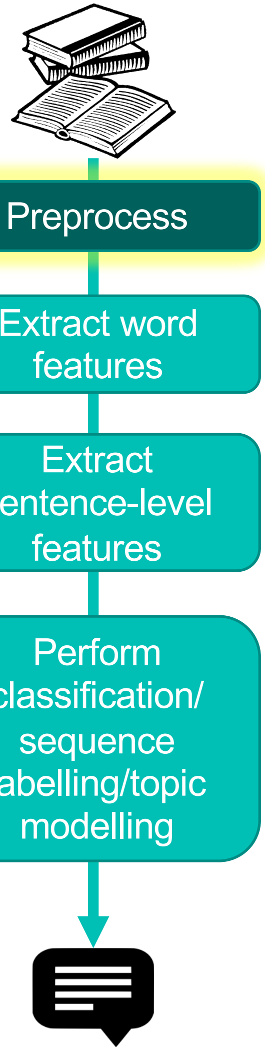
- Typical steps are:

1. Tokenisation;
2. Word normalisation;
3. Sentence segmentation.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Text Normalisation

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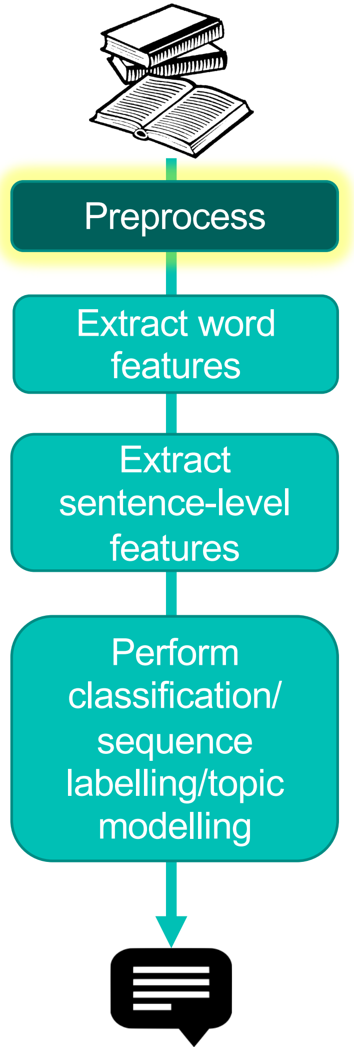
- Why do we need them?



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Tokenisation

- Split on whitespace, punctuation
- Use dictionaries to identify multi-word phrases or to split words
- How does tokenisation differ between languages?

- https://uob.padlet.org/edwinsimpson/khs5rhkbpco7kdtk

Normalising Word Formats

Step	Example input	Output
Replacing emojis with text	🔥 🎅🏾 🇲🇽	*Fire* *Santa Claus: medium-dark skin tone* *flag: Mexico*
Normalising URLs, hashtags	*http://www.bristol.ac.uk* *#NLProc*	*URL* *HASHTAG*
Stopword removal	*the*	
Case folding	*The* *THE*	*the* *the*
Lemmatisation/ Stemming	*is* *reading*	*be* *read*

Lemmatization

- Words have internal structure:
  - They are composed of stems and affixes
  - “Cats” contains the stem “cat” and an affix “s”
- Replace each word with its root form or **lemma**
- Implement by applying a series of regular expression substitutions
- Example implementation: WordNet Lemmatizer
- Porter stemmer provides a quicker but more error-prone alternative.

Blackboard Quiz

- Post your answers here anonymously:
- https://uob.padlet.org/edwinsimpson/p51jjczj4baw1fl

Lab 4: Regexp and Text Normalisation

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Switch to Jupyter notebook…