NATURAL LANGUAGE PROCESSING

Daman Virdi

ANALYZE TEXT WITH THE LANGUAGE SERVICE

ANALYZE TEXT WITH THE LANGUAGE SERVICE

- Analyzing text is a process where you evaluate different aspects of a document or phrase, in order to gain insights into the content of that text.
- For the most part, humans are able to read some text and understand the meaning behind it. Even without considering grammar rules for the language the text is written in, specific insights can be identified in the text.

TEXT ANALYTICS TECHNIQUES

- Text analytics is a process where an artificial intelligence (AI) algorithm, running on a computer, evaluates these same attributes in text, to determine specific insights.
- Techniques that can be used to build software to analyze text
  - Statistical analysis of terms used in the text
  - Extending frequency analysis to multi-term phrases
  - *Stemming*
  - *Lemmatization*
  - Applying linguistic structure rules to analyze sentences
  - Encoding words or terms as numeric features
  - Creating *vectorized* models

- In Microsoft Azure, the **Language** cognitive service can help simplify application development by using pre-trained models that can:
  - Determine the language of a document or text (for example, French or English).
  - Perform sentiment analysis on text to determine a positive or negative sentiment.
  - Extract key phrases from text that might indicate its main talking points.
  - Identify and categorize entities in the text. Entities can be people, places, organizations, or even everyday items such as dates, times, quantities, and so on.

AZURE RESOURCES FOR THE LANGUAGE SERVICE

- **Language** resource
- **Cognitive Services** resource

- Language detection
- Ambiguous or mixed language content
- Sentiment analysis
- Indeterminate sentiment
- Key phrase extraction
- Entity recognition

LANGUAGE MODEL WITH CONVERSATIONAL LANGUAGE UNDERSTANDING

LANGUAGE SERVICE

- *Utterances*
- *Entities*
- *Intents*

TWO MAIN TASKS FOR CONVERSATIONAL LANGUAGE UNDERSTANDING

- *Authoring* the model
- Publish the model

AZURE RESOURCES FOR CONVERSATIONAL LANGUAGE UNDERSTANDING

- Language Service
- Cognitive Services

- Authoring
  - Creating intents
  - Creating entities
    - Machine-Learned
    - List
    - RegEx
    - Pattern.any
- Training the model
- Predicting

NATURAL LANGUAGE PROCESSING

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RECOGNIZE AND SYNTHESIZE SPEECH

TO ENABLE INTERACTION, THE AI SYSTEM MUST SUPPORT TWO CAPABILITIES:

- **Speech recognition** - the ability to detect and interpret spoken input.
- **Speech synthesis** - the ability to generate spoken output.

SPEECH RECOGNITION

- *Acoustic* model
- *Language* model

- **Speech synthesis**

SPEECH COGNITIVE SERVICE API'S

- The **Speech-to-Text** API
- The **Text-to-Speech** API

AZURE RESOURCES FOR THE SPEECH SERVICE

- A **Speech** resource
- A **Cognitive Services** resource

- The speech-to-text API
- Real-time transcription
- Batch transcription
- The text-to-speech API
- Speech synthesis voices

TRANSLATE TEXT AND SPEECH

- Literal and semantic translation
- *Text translation*
- *Speech translation*

MICROSOFT AZURE PROVIDES COGNITIVE SERVICES THAT SUPPORT TRANSLATION

- The **Translator** service : text-to-text translation.
- The **Speech** service : speech-to-text and speech-to-speech translation.

- Text translation with the Translator service
- Optional Configurations
  - Profanity filtering
  - Selective translation

SPEECH TRANSLATION WITH THE SPEECH SERVICE

- **Speech-to-text** - used to transcribe speech from an audio source to text format.
- **Text-to-speech** - used to generate spoken audio from a text source.
- **Speech Translation**- used to translate speech in one language to text or speech in another.

- **Speech Translation** API