

# Homework

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## 1 My favourite topics in language studies and computer science:

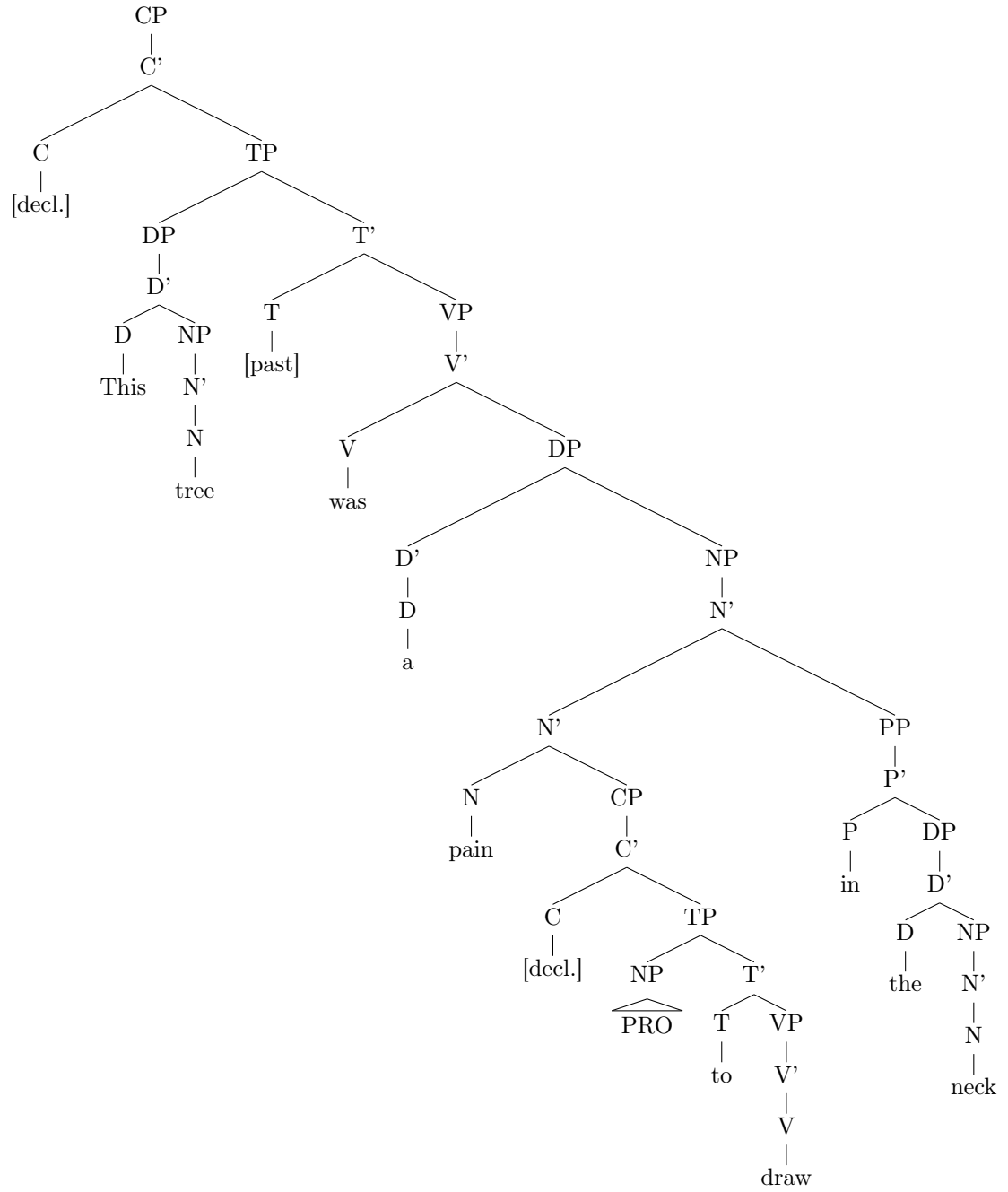
1. Corpus stylistics
2. Literary translation
3. Sentiment analysis
4. Python programming
5. SQL data-base management

## 2 Phonetic Transcription

|| maɪ neɪm ɪz 'mæθju: || aɪ əm ə 'stju:dənt ɒv 'nætʃrəl 'læŋwɪdʒ 'prəʊsesɪŋ ænd aɪ  
æm 'raɪtɪŋ maɪ 'mɑ:stə 'θi:sis ə'baʊt ə 'kɔ:pəs beɪst stɑ:lɪstɪk 'stɑ:di ɒv 'mɒdən  
'saɪəns'fɪkʃən 'lɪtərɪʃən || aɪ əm 'ɔ:lsəʊ 'mtrɪstɪd ɪn 'lɪtərəri træn'sleɪʃən ||

|| na'zɪvəm 'tʃe mɑ'tɛʊf || 'jɛstəm stju'dentəm pʃetfa'zɑpɑ jɛ'zɪkɑ nætʃrəl'nɛgɔ ||  
v 'rɑmɑx 'mɔjɛj 'prɑtsɪ mɑg'i'stɛrsk'jɛj 'pɪfɛ ɔ kɔrpu'sɔvɛj ɑnɑ'lɪzɛ lɪtɛrɑ'tʃʊri  
saɪəns'fɪkʃən ||

### 3 A Syntactic Tree



## 4 Phonological Rules

### Spirantization

$$\begin{bmatrix} +\text{stop} \\ -\text{voice} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{voice} \\ -\text{stop} \\ +\text{fricative} \end{bmatrix} / \begin{bmatrix} +\text{vowel} \end{bmatrix} \_ \begin{bmatrix} +\text{vowel} \end{bmatrix}$$

### Postnasal Voicing

$$\begin{bmatrix} +\text{stop} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{voice} \end{bmatrix} / \begin{bmatrix} +\text{nasal} \end{bmatrix} \_$$

### Nasalization

$$\begin{bmatrix} +\text{vowel} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{nasal} \end{bmatrix} / \_ \begin{bmatrix} +\text{nasal} \end{bmatrix}$$

### Nasal Consonant Shortening

$$\begin{bmatrix} +\text{consonant} \\ +\text{nasal} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{short} \end{bmatrix} / \_ \begin{bmatrix} +\text{consonant} \\ -\text{voice} \end{bmatrix}$$

## 5 Mathematical Equation

Similarity measure for syntactic trees:

$$S_{TO}(T_1, T_2) = \frac{\max_{n_1 \in \text{nodes}(T_1), n_2 \in \text{nodes}(T_2)}} C_{TO}(n_1, n_2)$$

Sum of operation on syntactic trees:

$$\gamma(S) = \sum_{i=1}^{|S|} \gamma(S_i)$$

Source: *Mathematical Equation Structural Syntactical Similarity Patterns: A Tree Overlapping Algorithm and Its Evaluation* by Evgeny Pyshkin

## 6 Pgfplots package

Pgfplots is an advanced package used for creating both 2D and 3D graphs. The graphs are of high quality, but compiling them requires a great deal of processing power. Here are some examples of what Pgfplots can do:

