Automatic generation of short Irish WIKIPEDIA texts

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Introduction

1. We present the first system for generating Wikipedia texts in Irish on demand (English available too).
2. Our system is based on rules, and models Irish grammar and Irish words.
3. Below we show step by step what happens when you request a text using the demo.
4. **Use the demo yourself: scan the code on the top left corner!**

Why not using ChatGPT or machine translation to produce Irish texts?

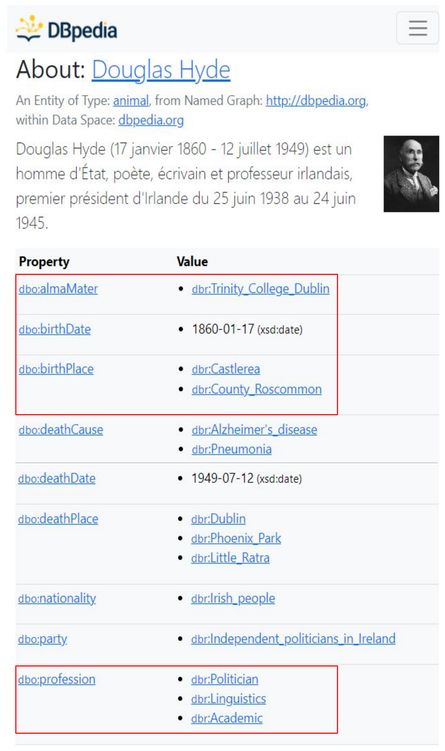
1. Large Language models used by ChatGPT or machine translation can produce very fluent text but the contents are **not always accurate**. Accuracy is crucial when generating factual knowledge.
2. Large Language models can **consume an incredible amount of resources** and **can be expensive** to use. Our system has a total disk space of ~10MB and runs with <1GB of RAM.
3. Large Language models are **black boxes**. We like languages, so we like understanding what is happening when a text is created. Rule-based systems allow for full control of the process.

1 - Get information about chosen entity on DBpedia

DBpedia is a structured repository that underlies the infoboxes in Wikipedia!

It allows us to access info needed for generation:

- **Properties**: birth date, birth place, etc.
- **Class** information: Person, Band, Location, etc.
- **Gender** information.
- **Irish** Named entity labels



On the right side, we use the 4 properties in the red frames for illustration: almaMater, BirthDate, BirthPlace, profession.

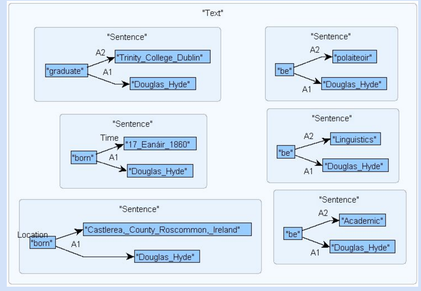
2 - Generate text for selected properties

We use the **FORGe** generator for the semantic and syntactic processing and modelling the lexicon.

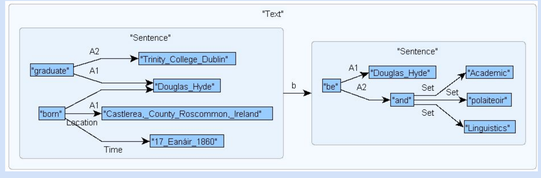
We use **Irish NLP tools** for the morphological processing.

2.1: Semantic processing

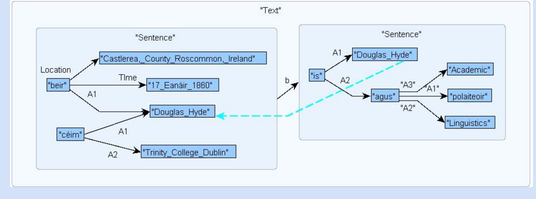
Map each property/value to an abstract linguistic structure.



Then package the properties into sentences.



Then map linguistic units to Irish content words.



Lexicon

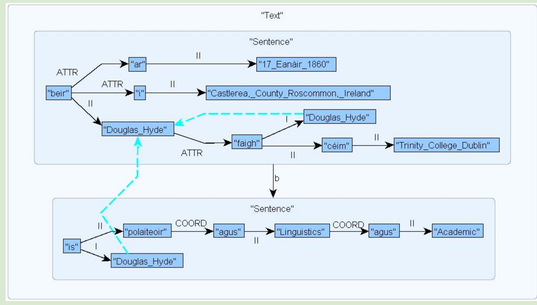
To go from semantic to syntax, we use lexical resources that describe the Irish words, in which we store:

- features such as part of speech and gender;
- if they have semantic participants, and how many;
- which other words they typically combine with.
- etc.

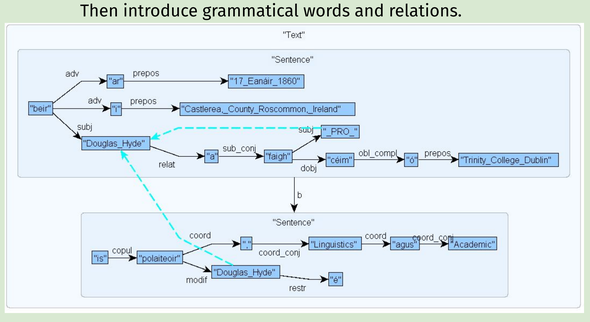
```
"céim_NN_01":_noun_ {
  // degree (graduate)
  project = "webNLG"
  lemma = "céim"
  gender = "FEM"
  Cperl = "faigh_VB_01"
  gp = {
    A1 = I
    A2 = II
    I = {}
    II = { prep = "ó" }
  }
}
```

2.2 Syntactic processing

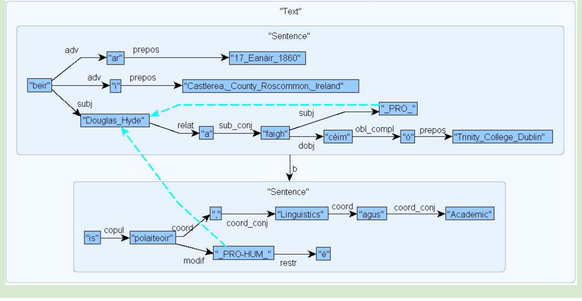
Define the structure of each sentence.



Then introduce grammatical words and relations.



Then introduce cross-sentence pronouns.



2.3 Morphological processing

Before starting, we define the order of the words. Then, for each word, we get the inflected form.

FORGe	Morphology	Post-processing
beir+Verb+PastInd+Auto Douglas_Hyde+Noun+Masc+Com+Sg , a faigh+Verb+PastInd céim+Noun+Fem+Com+Sg ó Trinity_College_Dublin , Castlerea,_County_Roscommon,_Ireland ar 17_Eanáir_1860 . is+Cop+Past polaiteoir+Noun+Masc+Com+Sg é , Linguistics+Noun+Masc+Com+Sg agus Academic+Noun+Masc+Com+Sg .	rugadh Douglas_Hyde , a fuair céim ó Trinity_College_Dublin , Castlerea,_County_Roscommon,_Ireland ar 17_Eanáir_1860 . ba polaiteoir é , Linguistics agus Academic .	Rugadh Douglas Hyde , a fuair céim ó Trinity College Dublin , gCastlerea, County Roscommon, Ireland ar 17_Eanáir_1860 . Ba polaiteoir é , Linguistics agus Academic .

The final text looks like the following:

Rugadh Douglas Hyde, a fuair céim ó Thrinity College Dublin, i gCastlerea, County Roscommon, Ireland ar 17 Eanáir 1860. Ba polaiteoir é, Linguistics agus Academic.

Or in English:

Douglas Hyde, who graduated from Trinity College Dublin, was born in Castlerea, County Roscommon, Ireland on January 17, 1860. He was a Politician, a Linguistics and a Academic.

Limitations - Future - Reference

1. We fully depend on the DBpedia quality:
   - Data errors! (e.g. *Linguistics* above).
2. It is an early version of our system:
   - We will improve the quality of texts.
   - We will increase the output variety.
   - We will cover more properties.
3. For more information about the system:
   - Simon Mille, Elaine Ui Dhonnchadha, Stamatia Dasiopoulou, Lauren Cassidy, Brian Davis, and Anya Belz. 2023. DCU/TCD FORGe at WebNLG'23: Irish rules! Technical report, ADAPT, Dublin City University. WebNLG 2023 System Description.