Aufgabe 3.1

Exercise 3-1: Who is doing what in your team

Send a short description, who will do what in your team, if you are working in a team. If you are working alone this is not necessary. It is currently enough to send a plan just for the part of the exercise described in this file. Deadline 12.11-2025.[1]

Aufgabe 3.2

Extract waypoint names from given utterances from communication between air traffic controllers and pilots:

- → “lufthansa seven one two proceed direct to geska” (GESKA)¶
- → “lufthansa seven one two hello identified maintain flight level three three zero proceed direct to geska” (GESKA)¶
- → nor shuttle five eight romeo maastricht identified continue direct to maseg (MASEG)¶
- → confirm euro wings three november kilo is proceeding to Magdeburg (MAG)¶
- → easy one one zulu proceed direct oscar sierra november (OSN)¶
- → easy one one zulu proceed direct osnabrueck (OSN)¶
- → easy one one zulu proceed direct osnabrueck oscar sierra november (OSN, and only once)¶

Aufgabe 3.2

Extract waypoint names from given utterances from communication between air traffic controllers and pilots:

› speed·bird·six·five·tango·cleared·to·pebep(PEBEP)¶
› i·say·again·you·are·cleared·to·laret·i·spell·lima·alfa·romeo·echo·tango·(LARET·and·only once)¶
› gogsi·direct·speed·bird·six·two·four·(GOGSI)¶
› london·good·day·fraction·five·one·nine·uniform·descending·flight·level·one·two·zero inbound·lydd·(EGMD)¶

C:\WINDOWS\system32\cm...

Aufgabe 3.3

In this exercise you will benefit from your Levenshtein distance implementation.

Use the information of the allowed waypoint names. This could be more than 600.

In the previous exercise we used the output from a perfect speech recognizer, which does not exist in the real world. So, your algorithms need to handle these errors.

Aufgabe 3.3

- “eight four six three roger and turn right direct to lydd”, but recognized was “fource xix three yeah roger turn right direct to lid” (EGMD)
- “speed bird eight seven papa charlie route directbenbo” but correct would be “peed bird eight seven papa charlie route direct benbo” with a blank
- direct bebos ebi speed bird eight seven papa charlie, but correct is “direct benbo sp* speed bird eight seven papa charlie” (“sp* means that the word starting with “sp” is not fully spoken).
- speed bird eight papa whiskey resume own navigation sitet and contact london one three five decimal zero five five good bye, but “citet” is recognized.

Aufgabe 3.3

- climb level two one zero direct lelna easy eight seven yankee Quebec, but “lelm” recognized.
- “descending altitude four thousand level evata fraction two one two romeo”, but we recognize “descending alposute four thousand level evato fraction two one two romeo”. This example shows that there could be also problems with other words.
- “dark knight four charlie direct benbo climb flight level one seven zero”, but we recognize “dark knine four charlie directbenbo climb flight level one seven zero”

Aufgabe 3-4

Exercise 3-4 Implement a faster Levenshtein distance calculation

The number of allowed waypoints could be quite high, e.g. in the order of 600.The complexity of the Levenshtein distance algorithm is O(n*m), where n and m are the lengths of the two words. In most cases, n and m are equal to 5, but you have seen examples with 10.

Comparing 600 words could require a lot of processing time and if you also want to correct other word errors, you need to find some clever heuristics.

Tasks

- Reading json file
- Implement Levenshtein distance class as a template class
- Calculation of WER for a given directory
- Classification whether an utterance contains a waypoint
- Output of corrected Waypoints