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Programming for Data Science

Winter term 2020/2021

Assignment 6
Issued: 2020-11-09

1 Parse function

Write a function `parse_csv` that takes a filename, a `separator` character and a `has_header` flag and parses the provided csv file and returns the content in a proper data structure (e.g. list of lists or dictionary of lists)

2 Comprehensions I

Use your parse function to read the *phonebook.csv* file already used in the KNIME exercises. Use the proper comprehension (list, dict, set,..) to generate to the following collections:

1. all unique forenames separately for females and males (if gender can be inferred from title entry).
2. all entries (complete rows) for persons where forename and surname are longer than 8 characters.
3. all surnames (unique) containing more vowels than consonants
4. all tuples (forename, surname, title) sorted by surname
5. a rank list containing the ranks of the rows when ordered by surname (first) and forename (second)

Remark: Each of the collections should be produced by just a single comprehension expression, aka a one-liner

3 Comprehensions II

Use list comprehension to generate from two lists of integers, A and B a list containing for each element a_i of A a list with values $[a_i^{b_0}, a_i^{b_1}, ...]$. Example: $A = [1, 2, 3, 4]$ and $B = [1, 3, 5]$ produces $[[1, 1, 1], [2, 8, 32], [3, 27, 243], [4, 64, 1024]]$

Hint: Nested comprehension

4 Dictionary with Lambdas

Create a dictionary with lambda functions as values and proper keys and modify your calculator from last week such that it performs the correct arithmetic operation without if clauses.