Project: En/Decoder for Morse code and Roman numerals

E-mail submission to: m.rack@fz-juelich.de
Submission deadline: 31 October 2018. 11:59 p.m.

Criteria:

The final mark for the course "Scientific data analysis and modelling" will be defined by the successful completion of a programming project. As usual, 50% success are required to reach the mark "ausreichend" (4.0), 55% correspond to (3.7), ..., and finally 95% or better correspond to "sehr gut" (1.0).
Your program will be evaluated based on the following criteria (each criteria will have a different impact on the final mark).

- The result of the submitted program will have the strongest impact on your mark (up to 70%). It will be evaluated whether you program executes without any errors and fulfils the requirements as stated below.
- The second-most important aspect is a sufficiently documented code (up to additional 20%). Your comments within the code need to allow everyone – who knows the basics of coding – to read, understand, and extend your program.
- Finally, the performance/speed of your program is important (the final 10%). Your program will be checked whether or not it could be speeded-up by usage of Python's features also including standard packages like NumPy, SciPy, etc. (If I manage to speed-up the program by a factor of (a) 10 or more, 0% will be granted for this criteria, (b) between 5 (included) and 10, 5% will be granted, and (c) less then 5, 10% will be granted.)

Project description:

Morse code is a binary decoding of letters, numbers, punctuation and a minor set of procedural signals (called Morse code prosigns) which was in major use at the onset of telecommunication. Each character is decoded by a sequence of short and/or long signals. In written form it is expressed in a combination of "." and "_". A longer pause (space) separates two words.
Roman numerals are a much older form of writing numbers in a sequence of letters (I, V, X, L, C, D, M). It is another form of encoding information in a compressed form. Single letters do have discrete values. Combination of several letters can be used to express all positive integer numbers up to a certain limit.
Write a program for encoding and decoding of Morse code as well as Roman numerals. The program needs to en/decode entire texts and not only single words or letters. It has to accept a string/text file of arbitrary length as input, detect whether it contains Morse

code, Roman numbers, or simply plain text and performs the reasonable conversion. However, it has to distinguish between Morse code and Roman numerals de/encoding. Plain numbers can be encode in both forms.