Lab Assignment 04 - Feature Extraction

- Input data files are available in "**Input files for Assignment04**" folder

Program 1: Develop a command line program to extract the features of a protein sequence file.

Input File

Sequence	Class
PGGGKVQIVYKPV	+
PGGGKVYKPV	-
PGGGKNAEVYKPV	-
PGGGKVQIVEKPV	-
QTAPVPMPDLKNVKVY	-
KPVDLSKVTSKCGSLGNIHLDF	-

Output File

SN	F1	F2	F3	F4	F5	F6	Class
1	4	0	2	3	2	1	1
2	5	3	3	2	2	2	0
3	4	5	2	3	3	4	0
4	3	4	0	2	5	5	1
….	….	…	….	…..	…..	…..	…..

1.1 Description:

- Input file contain only two columns: first column is the protein sequence and second column is the class (either -ve or +ve).
- Extract the feature of the sequence as given below rule:

SN→ SN of sequence
F1→ Count the number of N in sequence
F2→ Count the number H in sequence
F3→ Count the number Q in sequence
F4→ Count the number G in sequence
F5→ Count the number D in sequence
F6→ Count the number T in sequence
Class→ Replace "+ with 1" and "– with 0"

1.2 Run the program through command line as:

python extractFeatures.py <inputFile1> <inputFile2> …… n

Example:

- python extractFeatures.py inputfile1.csv
- python extractFeatures.py inputfile1.csv inputfile2.csv
- python extractFeatures.py inputfile1.csv inputfile2.csv inputfile3.csv

1.3 Input/Output Files:

- Input File(s) → file1.csv | file1.csv file2.txt | file1.txt file2.csv file3.txt
- Output Files → One result file and one log file
  - **Result file:**
    - It contains the extracted features for every sequence present in the input file(s).
    - Name of the result file → "result-" + str(time.time()) + ".csv"
    - e.g. → "**result-20202109.csv**"
  - **Log file:**
    - It contains three columns (inputFileName, Sequence, Class) having issues with the sequences or with the class label in the input file(s).

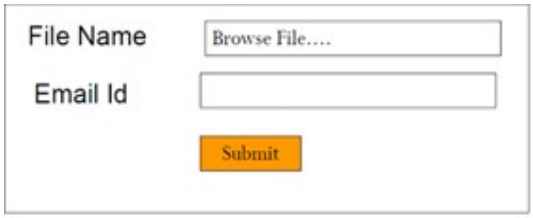
        - Missing sequence or sequences having any numeric value
        - Missing class label
    - Name of the log file → "log-" + str(time.time()) + ".csv"
    - e.g. → "**log-20200909.csv**"
    - Log file content

FileName, Sequence, Class	
file1.csv, AGERT5DCT, +	← Sequence contain numeric value
file2.csv, ARGVT,	← Sequence class is missing
file3.txt, , -	← Sequence is missing
file4.txt, A4ADER,	← Sequence contain numeric value & class is missing

1.4 Check for:

- Correct number of parameters
- Show appropriate message for wrong inputs.
- Handling of "File not Found" exception
- Input file(s) contain only two columns.
- Output file name will be "result-" + str(time.time()) + ".csv"
- Log file name will be "log-" + str(time.time()) + ".csv"

Program 2: Develop a web service for Program 1.



2.1 User Should get:

- Result File
- Log File