Data Mining 2017 Fall

HW0 : Python Practice

Please complete each function in the template.py, and then change the file name to your student ID. ( E.g. template.py🡺106761502.py). Submit the file to WM5.

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**1. Cosine similarity**

Complete the function that given two vectors A and B represented as Python lists, you should return the value of cosine similarity of these two vectors. (cosine similarity : )

For an example, if A is [1,2,3] and B is [2,4,6], the cosine similarity of A and B is



**2. Grades**

Given a csv file consisting of name, age and score of several students, please complete the function to build the python dictionary structure and tuple structure. The csv file is specified as the file path such as “./example.csv”.

(1) To summarize the score of the students, the scores ranging from 0 to 99 are divided into 10 intervals, [0,9], [10,19], …, [90, 99]. In each interval, we count the number of students whose scores falling into the interval. The dictionary structure stores all the non-zero intervals.

(2) The tuple structure stores the records of students sorted in ascending ordered by name first, then age and score.

(3) Finally, save the content of the tuple to the file in the current path and return the dictionary and tuple.

For example, the content of the csv file is:

Name, Age, Score

Kevin, 26, 80

John, 20, 99

Joe, 20, 60

Bill, 21, 60

Kevin, 25, 70

The return dictionary will be: {‘60~69’:2, ‘70~79’:1, ‘80~89’:1, ‘90~99’:1}.

The return tuple will be : [(Bill,21,60), (Joe,20,60), (John,20,100), (Kevin,25,70), (Kevin,26,80)]

After saving, the new file should be:

Bill, 21, 60

Joe, 20, 60

John, 20, 100

Kevin, 25, 70

Kevin, 26, 80

**3. The validity of password**

Morris is a security engineer who works in Trend Micro. He wants to write a python code to check the passwords. Please complete the function to help Morris check the passwords.

The rules of the password are in the following:

1. At least one uppercase letter in the password
2. At least one lowercase letter in the password
3. At least two numbers in the password
4. At least one special character form %,!,?,#,@,$
5. The length x of the password is 

The input will be a number of passwords which are separated by a comma (,). Please return a list including the correct passwords.

For an example, the input of the function will be [Ab12!,AA1234!?,AbCdEfGh,12345AaBa!, 12Zz!?98Aa#@]

The return result of the function should be [Ab12!, 123456AaBa!]