Problem Solving Methodology in IT (COMP1001)

Assignment FIVE (50 marks in total)
(Due at noon on 26 October 2017)

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1. [20 marks] You are given a text file called `class.txt` of all the students in the class with their English names and five fabricated assessment marks. The adjacent items are separated by a tab in the file. Write a Python program called [`your studentID`]`_Q1.py` that reads the file, calculates the average mark of each student, and stores the result to a new file called `output.txt`. Each line of the new file should contain a student name and his/her average mark, separated by a tab. Both files are available in Blackboard for your reference. Your program must ensure the files are read from and stored in "C:\\COMP1001".

2. [10 marks] In A4 Q2, uppercase letters and lowercase letters are treated as the same. In this question, modify your A4 Q2 so that it handles uppercase letters and lowercase letters differently. Also, for other input characters other than letters, no encryption is required. In addition, at the end of the program, output the total number of non-English letters in the input. Submit your work as [`your studentID`]`_Q2.py`. Here are the sample input and output:

```
Please enter a key: zaqxswcdevfrbgtnhymjukilop
Please enter a string to be encrypted: dENnis
xSGgem
Total number of non-English letters are: 0
>>> main()
Please enter a key: ipnqebsyclvodamrkzgjhfuxtw
Please enter a string to be encrypted: COMP1001 is so interesting! :P
NMDR1001 cg gm cajezegjcas! :R
Total number of non-English letters are: 10
>>>
```

3. [20 marks] Write a function called `genStates()` that does not have input and will return a list of 16 4-character strings in alphabetic order (i.e., from A to Z). Each character in the string is either "E" or "W". Executing `print(genStates())` will therefore give the output below. Of course, you cannot hardcode them in a list. Submit your work as [`your studentID`]`_Q3.py`.

```
['EEEE', 'EEEW', 'EEWE', 'EEWW', 'EWEE', 'EWEW', 'EWWE', 'EWWW', 'WEEE', 'WEEW',
 'WEWE', 'WEWW', 'WWEE', 'WWEW', 'WWWE', 'WWWW']
```