**Lab 4 – Password Verification**

Please write a Java program to check a password to see whether it is really secure. Your program must report **all** the security violations. Please see the following sample **test run** to design your program properly. You must test your program with at least **10** different passwords. Among those 10 passwords to be tested, the first 5 must be the same as those in the following sample test runs. Please make sure your program can detect all 7 violations for each password.

Each password must satisfy all the following 7 rules:

Rule 1: Valid Length – The length of the password must be 8 to 16 only.

Rule 2: No Space – The password must not contain any space or blank character.

Rule 3: At least 2 digits – The password must contain at least 2 digits.

Rule 4: At least 2 upper-case letters – The password must contain at least two upper-case letter.

Rule 5: At least 2 lower-case letter – The password must contain at least two lower-case letter.

Rule 6: At least 1 special character – The password must contain at least one special character, which can be one of the following 7 choices: ‘$’, ‘#’, ‘@’, ‘&’, ‘\*’, ‘?’, or ‘!’.

Rule 7: No special numbers – The password must not contain any of the following 7 numbers: 2017, 2016, 2015, 2014, 2013, 2012, or 2011.

**Modularity Programming Techniques/Requirements:**

You must create at least 7 methods in your Java program.

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The following 5 passwords must be tested by your program first. Then, you must test your program with 5 more passwords. In other words, you must show the testing output of 10 different passwords.

**The password “3 7”** violates the following rules:

Rule 1: Valid Length – The length of the password must be 8 to 16 only.

Rule 2: No Space – The password must not contain any space or blank character.

Rule 4: At least 1 upper-case letter – The password must contain at least one upper-case letter.

Rule 5: At least 1 lower-case letter – The password must contain at least one lower-case letter.

Rule 6: At least 1 special character – The password must contain at least one special character, which can be one of the following 7 choices: ‘$’, ‘#’, ‘@’, ‘&’, ‘\*’, ‘?’, or ‘!’.

**The password “$16SLin$”**

Congratulations! Your password “$16SLin$” is very secure!

**The password “$7SimonLIN”** violates the following rule:

Rule 3: At least 2 digits – The password must contain at least 2 digits.

**The password “SHLin2016$”** violates the following rule:

Rule 7: No special numbers – The password must not contain any of the following 7 numbers: 2017, 2016, 2015, 2014, 2013, 2012, or 2011.

**The password “$2018Dr.LinWins”**

Congratulations! Your password “$2018Dr.LinWins” is very secure!==========================================================================.

**How to submit your Lab or Project Assignment (PA)?**

(1) Each program must be well-documented with block comments and proper line comments. The

beginning of each program must have a block comment to show your name, date, and purpose.

The following is an example of block and line comments.

// Author: Dr. Simon Lin

// Date: 2/17/2016

// Purpose: To verify password for its security strength

String pwd ; // pwd is password to be verified

(2) You must submit the following items as attachments through sakai.apu.edu.

(a) All source programs (i.e., all **.java** files), and

(b) One WORD document (i.e., **.doc** or **.docx** file) containing all source programs’ listing and the

output of your hash table. ==========================================================================.

Grading Rubric:

You got \_\_\_ points out of 100 for **CS250 Lab 4**. Thank you for your excellent/good work.

[ ] -10 points for each day late.

[ ] 30 points – Your program must be fully tested with 10 different passwords as specified in the assignment. The complete output must be shown on your Word document.

[ ] 10 points – Your program must be well-documented.

[ ] -5 points if your program did not have block comment to show your name, date, and purpose.

[ ] 30 points – You must follow the program specification to develop your programs properly and completely.

[ ] 20 points – You must submit your WORD document.

[ ] 5 points – Your WORD document must show “**CS250 Lab 4**” and your full name on the **header**.

[ ] 5 points – Your WORD document must be page-numbered on the footer with format “Page 2 of 15” (for example).

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Please use this Word document as a template for your Word document to be submitted. Please delete everything above.

Please copy all your source programs into here:

Please copy your perfect hash table output into here:

Please describe your perfect hashing algorithm here: