**Your Name:**

**CMPSC222 Module 9 Assignment: Hash Function (20 pts)**

Upon completing this assignment, you will comprehend hash functions and their practical application. Please obtain the ‘passwords.txt’ file provided. Your objective is to create a password guessing program to crack passwords stored in a database. The program reads passwords from the text file, encrypts them, and stores them in an Access database. You will be prompted to guess a password, and the program will inform you if the guessed password matches any in the database.

**Description:**

* Create a Microsoft Access table named ‘**Passwords’** with a single column named ‘**password**‘ of type Text **(100).**
* Load plain passwords from an input text file named “**passwords.txt**” into the table.
* Convert each plain password to ciphertext and insert each ciphertext into the table.
* Prompts the user to enter a certain plain password, hash the input password, and check if it exists in the table.
* If the password exists, display "Entered password exists"; otherwise, display “No match found”.

**How to Implement?**

1. Create a new class named `PasswordCracker`
2. Includes the following members:

* Private `ArrayList<String>` named ‘passwords’.
* `void loadPasswords(String filename)`: This method loads plain passwords from an input text file into the ‘passwords’ array.
* `String encryptPassword(String password)`: This method reads a plaintext password and returns its hash value using the "MD5" algorithm.
* `boolean existPassword(String password)`: This method checks whether a given user password exists in the database.
* `void addPasswordToDatabase(String password)`: This method inserts a given password into the database only if it does not already exist. You need to call the `existPassword` method to check for existence before insertion.

Sample Output: underlined is user input.

**Password Cracker System:**

1. Load Passwords to DB
2. Crack Password
3. Exit

Choice: 1

Loading Completed.

**Password Cracker System:**

1. Load passwords to DB
2. Crack Password
3. Exit

Choice: 2

Enter a password attempt: jessica

Entered password exists!

**Password Cracker System:**

1. Load passwords to DB
2. Crack Password
3. Exit

Choice: 2

Enter a password attempt: gorilla

No match found

**Grading Rubric:**

* (2 pts) Connecting Database.
* (4 pts) loadPasswords method.
* (4 pts) encryptPassword method.
* (4 pts) existPassword method.
* (4 pts) addPasswordToDatabase method.
* (2 pts) Displaying menu and handling options.

Note: Keep the Java Programming Rules. If you do not follow any program guideline rules above, 10% (i.e., 2 points out of 20, 3 points out of 30) will be deducted.

**What to submit:**

* Compress your entire project and save it as ‘M9-yourfirstname.zip’.
* Submit the zip file to Canvas.
* Keep a backup copy of the files.