Password Manager

Description

In this assignment, you will create a program in Java that is a password manager that can be run from the console. You should use the Java cryptography examples in class to aid in completing this assignment. I highly encourage you to break apart components of the examples into separate methods (e.g. encrypt, decrypt, hash, etc) instead of having one very long method (e.g. main).

Your password manager should allow you to do the following:

1. If no password file exists, ask the user for an initial password that you then use to create a key (use PBKDF2). You should then store the salt along with a token that you can use to verify in the future that the user entered the correct password.
2. If a password file exists, ask the user for the password to access the file. Use the password they enter along with the stored salt to verify the user entered the correct password by decrypting the token that you stored in Step 1. The same salt will be used for every password.
3. Ask the user if they want to add a password, read a password, or quit.
    1. If they choose to add a password, prompt the user for a label and a password and then save an encrypted version of that password in the file.
    2. If the user chooses to read a password, prompt the user for the label and then return back the decrypted version of the password.
    3. If they choose quit, just exit the program using System.exit(0).
4. The file should be stored in the default directory of the program and should have the following format:

```
salt:encrypted_token
label1:encrypted_password1
label2:encrypted_password2
```

Below is an example of the file from a solution that was created:

```
xvbKAm57v61oYaftlj35Lg==:GqlR9TQey6MvyuQPZqvTDg==
Canvas:Cxn9qggt+g8KWUwkh7Nhs0l0na/xFWAnuu7kT4HVd8U=
SIS:+6GGBGEzIBciWI9a+URBemhIPn29GE/uxwVWoSdbDAo=
```

Below is an example run of the program where it creates a file initially as one does not exist

```
Enter the passcode to access your passwords: supersecret
No password file detected. Creating a new password file.
a : Add Password
r : Read Password
q : Quit
Enter choice: a
Enter label for password: Canvas
Enter password to store: givestudentsgreatgrades

a : Add Password
r : Read Password
```

```
q : Quit
Enter choice: a
Enter label for password: SIS
Enter password to store: register4courses

a : Add Password
r : Read Password
q : Quit
Enter choice: r
Enter label for password: Canvas
Found: givestudentsgreatgrades

a : Add Password
r : Read Password
q : Quit
Enter choice: q
Quitting
```

Grading

You will be graded as follows

- 10pts - Program meets all requirements above where passwords can be added, read, etc.
- -3pts - Program does not check if a file exists to use that existing password file
- -2pts - Program does not replace an existing password with a new password
- 0pts - Program has a compilation error, crashes, does not encrypt the passwords in the file, or does not meet the grading criteria above.

Submission

You can work on this assignment in groups of 2-3. If you do work in a group, only one person from the group submits the assignment. Please include names of the students you partnered with on this assignment so that they can receive credit. These names should be included as comments to Canvas.

Submit the .java files to Canvas. Do not submit a zip of your program.