EE 487 | Problem Set 21 | Name:_____
Applications of Cyber Engineering | Authentication | Section:_____

1. A) List the 3 Factors of Authentication. Give 3 examples of each factor (not from powerpoint).

i)

ii)

iii)

B) How does Google offer Multifactor Authentication for logins?

C) Do a driver's license and a passport count as Multifactor Authentication? Why or why not?

2. A) How does a company use UPC Proof of Purchase codes to authenticate customers and know that they have legitimately purchased a product so that they can be offered prizes and rebates?

B) How is this similar to the way hashes are used?

3. Look up iTunes Match. How can Apple <u>quickly</u> verify that you have the same music on your system that is in their database, even if you have several thousands of songs?

4. Connect to your Virtual Machine.

You will create two new user accounts and give them the same password, "**monkey**".

A) Perform the following commands to add these users.
Note: When prompted, enter the password "monkey", you will not see asterisks (*), but it *is* taking your input. You can choose anything you want for the remaining fields, or accept defaults. Hit 'y' when it asks if the information is correct.

```
sudo adduser facebook

sudo adduser usaa
```

Now take a look at how these passwords are stored in the shadow file.

```
sudo tail -2 /etc/shadow
```

B) You should see the lines for both of these new users at the bottom. The password is between the third '$' and the first ':'. Does it look like they used the same password? Why is that?

C) In real life, what keeps facebook employees with your password on their system from logging into your bank account and cleaning you out (assuming you use the same password)?

5. Continue using your Virtual Machine for this activity!
It is not always necessary to keep data confidential. Some documents should be public, but you still want to be able to verify the authenticity of the document.

A Civil War enthusiast group has posted the Gettysburg Address on their website.

http://www.civilwarfreaks.com/gettysburg.html

But we are not sure that they are posting the genuine document. Luckily, American presidents have always stored their public keys online for easy reference. President Lincoln's key can be found at:

http://www.presidents.gov/publickeys/lincoln.html

Is this document authentic? (Verify and explain using the RSA tool:
http://rona.cs.usna.edu/~si110/resources/rsa/index.html)