

211 – Operating Systems

Tutorial: Security

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1. Why are security and protection important even for computers that do not contain sensitive data?
2. Sharing and protection are conflicting goals. Give three significant examples of sharing supported by operating systems. For each, explain what protection mechanisms are necessary to control the sharing.
3. Explain what one-way functions are and give an example of how they are used in practice.
4. Why are passwords in UNIX stored together with a salt value?
5. What is the principle of least privilege and why does it make sense?
6. Represent the ownerships and permissions shown in this UNIX directory listing as an access control matrix. Treat each of the two users and two groups as principals.

Note: a is a member of users and systems, b is a member of users only.

```
-rw-r--r--  3 a   systems    4137 2010-03-16 14:19 .emacs
-rwxr-xr-x  3 b   users      6420 2010-03-16 14:19 os.pptx
-rw-rw----  1 b   systems    1997 2010-03-16 14:19 notes.txt
-rw-r----- 3 a   users      7442 2010-03-16 14:19 index.html
```