# CYBR 371

## Assignment 1: File System

### Access Control (ACL)

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# Question 1

Create an access matrix of the directories shown in Figure 1 and created by the script file-
system-setup.sh (see task 2). For each directory (group of directories) justify the permissions given
(e.g., why did you have to give rwx permission to X directory for X staff). The permissions set on
these directories must follow the principle of least privilege

| **Directory** | **Owner** | **Registered Doctor** | **Unregistered Doctor** | **Nurse** | **Receptionist** | **Administrator** |
|---|---|---|---|---|---|---|
| **Scripts** | Administrator | r-x | r-x | r-x | r-x | rwx |
| **Staff** | Administrator | - - - | - - - | - - - | r-x | rwx |
| **Patients** | Administrator | r-x | - - - | r-x | r-x | rwx |
| **Subdirectories of Staff** | | | | | | |
| Administrators | Administrator | - - - | - - - | - - - | r-x | rwx |
| Doctors | Administrator | - - - | - - - | - - - | r-x | rwx |
| Nurses | Administrator | - - - | - - - | - - - | r-x | rwx |
| Receptionists | Administrator | - - - | - - - | - - - | r-x | rwx |
| **Subdirectories of Doctors, Nurses, Administrators and Receptionists** | | | | | | |
| administrator_name | Administrator | - - - | - - - | - - - | r-x | rwx |
| doctor_name | Administrator | - - - | - - - | - - - | r-x | rwx |
| nurse_name | Administrator | - - - | - - - | - - - | r-x | rwx |
| receptionist_name | Administrator | - - - | - - - | - - - | r-x | rwx |
| **Subdirectories of Patient** | | | | | | |
| patient_name | Administrator | r-x | - - - | r-x | r-x | rwx |

## Question 4

Explain in detail where the ACL information of an object is saved on a Linux system
(EXT2, 3 and 4 file systems) and how your system keeps track of them.

Links:

- https://unix.stackexchange.com/questions/93508/where-is-acl-data-technically-stored
- https://www.rampfesthudson.com/where-are-acls-stored-in-linux/

This is dependent on the filesystem, but generally ACLs are metadata stored in the file nodes, just like traditional permissions, dates etc.

As the size of ACLs vary, they may end up being stored in separate blocks. That said, this detail will only matter if one is designing a filesystem or programming a filesystem driver.