Princeton University
COS 217: Introduction to Programming Systems
Unix File/Directory Permissions

Classes of File/Directory Users

Owner	A file/directory has an **owner**. A file/directory's **owner** is the user who created it. A file/directory's owner can issue `chmod` commands to change its permissions.
Group	A file/directory has a **group**. A group is a set of users. The owner of the file/directory can issue `chgrp` commands to change a file/directory's group to any other group of which the owner is a member.
Others	**Others** are everyone else!

File Permissions

Read	If a file has **read** permissions for its owner, its group, or others, then its owner, its group, or others can *examine* the contents of a file (via `cat`, `more`, `less`, `xxd`, `emacs`, etc.).
Write	If a file has **write** permissions for its owner, its group, or others, then its owner, its group, or others can *change* the contents of that file (via `emacs`, etc.).
Execute	If a file has **execute** permissions for its owner, its group, or others, then its owner, its group, or others can *execute* that file as a Unix command. It makes sense to give a file execute permissions if and only if it contains executable code: executable binary code, a Bash shell script, a Python script, etc.

Directory Permissions

Think of a directory as a table of file and directory names.

Read	If a directory has **read** permissions for its owner, its group, or others, then its owner, its group, or others can *examine* the table, that is, can find out what files are in the directory by issuing an `ls` command.
Write	If a directory has **write** permissions for its owner, its group, or others, then its owner, its group, or others can *change* the table, that is, can create new files/directories in the directory, remove files/directories from the directory, or rename files/directories in the directory.
Execute	If a directory has **execute** permissions for its owner, its group, or others, then its owner, its group, or others can *visit* the table, that is, can `cd` to that directory. If a directory also has **read** permissions for its owner, its group, or others, then its owner, its group, or others can copy files from that directory.