**File Permission on Linux**

**20 mins**

**Step 1: Creating a Directory Structure**

1. Open the shell terminal.
2. Make sure you are in your home directory (*/home/username*)

cd ~

pwd

1. Create a directory called Work:

mkdir Work

1. Navigate to the Work directory:

cd Work

1. Inside Work, create two directories Docs and Scripts:

**mkdir Docs Scripts**

**Step 2: Creating Files**

1. Navigate to the Docs directory:

cd Docs

1. Create two text files named doc1.txt and doc2.txt:

touch doc1.txt doc2.txt

1. Check if all the dir and files have been created correctly

Your output should be similar to this:

**A black screen with white text

Description automatically generated**

**Step 3: Using chmod (Symbolic)**

1. Use a command line to show the permissions for all directories and files under “Work” directory. The output should be as follow:

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Description automatically generated**

tree -p

1. Navigate to /Work/Docs directory

cd Docs

1. Set the following permissions for doc1.txt using symbolic notation:
   * Owner: Read, write, and execute. (u+rwx / u=rwx)
   * Group: Read and write. (g=rw)
   * Others: No permissions. (o-rwx, o= )

chmod u=rwx,g=rw,o= doc1.txt

1. Verify the permissions:

ls -l doc1.txt

tree -p

1. Modify the permissions for doc2.txt using symbolic notation:
   * Add execute permission for the group. (g+x)
   * No one can modify the document (a-w)

chmod g+x,a-w doc2.txt

1. Verify the permissions:

ls -l doc2.txt

**Step 4: Using chmod (Numeric) (0777)**

1. Set the following permissions for doc1.txt using numeric notation:
   * Owner: Full permissions (4+2+1 = 7)
   * Group: Read and execute. (4 + 1 = 5)
   * Others: No permissions. (0)

chmod 750 doc1.txt

1. Verify the permissions:

ls -l doc1.txt

1. Navigate back to the “Work” directory (one level up), and then change the permissions for Docs directory to:
   * Owner: Full permission (7)
   * Group: Can only create and delete files, and access its files and subfolders. (wx = 2 + 1 = 3)
   * Others: Can only list the content of the directory. (r = 4)

cd ..

chmod 734 Docs

1. Verify the permissions:

ls -l Docs

**Step 5: Setting Default Permissions with umask**

1. Set a umask so that newly created files have the following permissions:
   * Owner: Read and write. (rw = 4+2 =6, 7-6 = 1)
   * Group: Read only (7-4 = 3)
   * Others: No permissions. (7-0 = 7)

umask 0137

1. Create a new file doc3.txt and:

touch doc3.txt

1. check doc3.txt permissions

ls -l doc3.txt

**Step 6: Checking and Cleaning Up**

1. The permission under your Work directory should be as follow:

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Description automatically generated

tree -p

1. Remove the entire Work directory and its contents at from your home directory using relative path:

rm -r Work