**Linux Hands‑On System Administration Assignment**

**Scenario:**

You are assigned to prepare an environment on a Linux system to support a new service deployment. Your tasks include setting up directories and files, managing file operations, adjusting permissions and ownership, archiving files, creating symbolic links, and handling user and group management. Follow the tasks in sequence and verify your results at each step using Linux command line tools.

**Questions (Tasks)**

**Task 1: Environment Setup**

1. **Workspace Creation:**
   * Navigate to your home directory.
   * Create a new directory named system\_setup and change into it.
2. **Directory Structure:**
   * Within system\_setup, create three subdirectories:
     + data
     + logs
     + configs
3. **File Initialization:**
   * In the logs directory, create an empty file named system.log.
   * In the data directory, create two empty files: data1.txt and data2.txt.
   * In the configs directory, create a file named service.conf containing at least three configuration settings (e.g.,
   * setting1=value1
   * setting2=value2
   * setting3=value3).

**Task 2: File and Directory Management**

1. **Copying and Renaming Files:**
   * Copy the file data1.txt from the data directory to the logs directory and rename it to data\_backup.txt.
2. **Moving and Deleting Files:**
   * Move the file data2.txt from the data directory into the configs directory.
   * After verifying the move, delete data2.txt from the configs directory.

**Task 3: Permissions and Ownership**

1. **Adjusting Permissions:**
   * Change the permissions of the entire system\_setup directory (and all its contents) so that:
     + **Owner:** Read, write, and execute
     + **Group:** Read and execute only
     + **Others:** No access
2. **Verifying Permissions:**
   * Use an appropriate command to verify the permissions of the file service.conf.
3. **Creating a Secure File:**
   * In the data directory, create a file named secure.txt and modify its permissions so that only the owner can read and write (no execute, and no permissions for group and others).

**Task 4: Archiving and Compression**

1. **Archiving:**
   * Create a compressed tar archive of the entire system\_setup directory named system\_setup.tar.gz in your home directory.
2. **Verification:**
   * List the contents of the archive to verify that it contains the correct directory structure.

**Task 5: Symbolic Links**

1. **Creating a Symbolic Link:**
   * In the configs directory, create a symbolic link named link\_to\_log that points to the system.log file located in the logs directory.
2. **Testing the Link:**
   * Verify that the symbolic link works by listing its details.
   * Remove the original system.log file from the logs directory, then try accessing link\_to\_log to observe the result.

**Task 6: User and Group Management**

1. **User Creation:**
   * Create a new user named tester (using sudo) and set a password when prompted.
2. **Group Management:**
   * Create a new group named testgroup (using sudo).
   * Add the user tester to the group testgroup.
3. **Changing Ownership:**
   * Change the ownership of the entire system\_setup directory (and all its contents) so that it belongs to user tester and group testgroup.
4. **Verification:**
   * Verify that the ownership changes have been applied correctly.

**Task 7: Final Cleanup**

1. **Removing User and Group:**
   * Remove the user tester and the group testgroup from the system (using sudo).
2. **Deleting Created Files:**
   * Delete the system\_setup directory and the system\_setup.tar.gz archive from your home directory.