**NAME:  
DEPARTMENT:  
DATE OF SUBMISSION:  
  
  
Assignment: Basic Storage and LVM Operations**

**Instructions:**

You are working as a **Linux administrator** on **ServerA**. The system has three additional storage devices: **/dev/vdb, /dev/vdc, and /dev/vdd**. Follow the given scenarios and complete the tasks accordingly. Provide necessary commands and step-by-step explanations in your answers.

**Attach all screenshots** of the executed commands and results in the document.

**Section 1: Partitioning and Mounting**

**Task 1: Creating a Partition and Formatting**

A new **2GB disk space** has been added to **/dev/vdb**. Your task is to:

1. Create a **primary partition** on **/dev/vdb** using the fdisk utility (**vdb1**).
2. Format the newly created partition with the **XFS** filesystem.
3. Verify the created partition and its filesystem using appropriate commands.

**Task 2: Mounting the Partition**

1. Mount **vdb1** at **/mnt/data**.
2. Ensure that the mount persists after a system reboot.
3. Modify the **/etc/fstab** file to achieve persistence.

**Task 3: Preparing a Partition for Future Use**

A new **2GB disk space** has been added to **/dev/vdb**. Your task is to:

1. Create a **primary partition** on **/dev/vdb** using the fdisk utility (**vdb2**).
2. This partition will be used for future purposes, so no need to format or mount it.
3. List all the commands used in the entire process.

**Section 2: Logical Volume Management (LVM)**

**Task 4: Creating an LVM Volume**

Your manager has requested you to set up **Logical Volume Management (LVM)** using **/dev/vdc** and **/dev/vdd**.

1. Create a **Volume Group (VG)** named College.
2. Create a **Logical Volume (LV)** named Staffs with a size of **2GB**.
3. Format the logical volume with **XFS** and mount it on **/mnt/Education**.
4. Ensure the mount persists after a reboot by modifying **/etc/fstab**.

**Task 5: Extending an LVM Volume**

The Staffs volume is running out of space. Your task is to:

1. Increase its size by **3GB**.
2. Resize the filesystem accordingly.
3. List all the commands used for this operation.

**Task 6: Extending a Volume Group**

The College Volume Group needs additional space. Your task is to:

1. Add **/dev/vdb2** to the **College Volume Group**.
2. Use the vgdisplay command to verify the new space allocation.

**Task 7: Removing LVM Components and Reclaiming Space**

The College Volume Group is no longer needed. Your task is to:

1. Unmount /mnt/Education.
2. Delete the **Logical Volume (Staffs)**.
3. Remove the **Volume Group (College)**.
4. Free up the disks used in the LVM configuration.
5. Provide the step-by-step commands used in this process.

## ****Understanding the Workflow****

To better understand the LVM creation process, refer to the following workflow diagram:

**(Attach a diagram illustrating the steps of LVM creation, including physical volumes, volume groups, logical volumes, and mounting.)**

**Submission Requirements:**

* Document all commands and steps performed.
* Attach screenshots for each step.
* Ensure that all changes persist after reboot.