Exercise 13.2 Filesystem Quotas

1. Change the entry in `/etc/fstab` for your new filesystem to use user quotas (change `noexec` to `usrquota` in the entry for `/mnt/tempdir`). Then remount the filesystem.
2. Initialize quotas on the new filesystem, and then turn the quota checking system on.
3. Now set some quota limits for the normal user account: a soft limit of 500 blocks and a hard limit of 1000 blocks.
4. As the normal user, attempt to use **dd** to create some files to exceed the quota limits. Create `bigfile1` (200 blocks) and `bigfile2` (400 blocks).

   You should get a warning. Why?
5. Create `bigfile3` (600 blocks).

   You should get an error message. Why? Look closely at the file sizes.
6. Eliminate the persistent mount line you inserted in `/etc/fstab`.

Solution 13.2

1. Change `/etc/fstab` to have one of the following two lines according to whether you are using a real partition or a loopback file:

   ```
   /dev/sda11     /mnt/tempdir ext4 usrquota      1 2
   /imagefile     /mnt/tempdir ext4 loop,usrquota 1 2
   ```

   Then remount:

   ```
   $ sudo mount -o remount /mnt/tempdir
   ```

2. ```
   $ sudo quotacheck -u /mnt/tempdir
   $ sudo quotaon -u /mnt/tempdir
   $ sudo chown student.student /mnt/tempdir
   ```

   (You won't normally do the line above, but we are doing it to make the next part easier).
3. Substitute your user name for the `student` user account.
4. ```
   $ sudo edquota -u student
   ```
5. ```
   $ cd /mnt/tempdir
   $ dd if=/dev/zero of=bigfile1 bs=1024 count=200
   200+0 records in
   200+0 records out
   204800 bytes (205 kB) copied, 0.000349604 s, 586 MB/s
   $ quota
   Disk quotas for user student (uid 500):
   Filesystem blocks quota lim grace files qu lim gr
   /dev/sda11    200   500  1000   1    0   0
   $ dd if=/dev/zero of=bigfile2 bs=1024 count=400
   sda11: warning, user block quota exceeded.
   400+0 records in
   400+0 records out
   4096600 bytes (410 kB) copied, 0.000654847 s, 625 MB/s
   ```

   Create `bigfile3` (600 blocks).
6. ```
   $ quota
   ```

```
Disk quotas for user student (uid 500):
Filesystem blocks quota limit grace files qu lim gr
/dev/sda11    600*   500  1000 6days   2  0  0
$ dd if=/dev/zero of=bigfile3 bs=1024 count=600
sda11: write failed, user block limit reached.
dd: writing ‘bigfile3’: Disk quota exceeded
401+0 records in
400+0 records out
409600 bytes (410 kB) copied, 0.00177744 s, 230 MB/s
$ quota
Disk quotas for user student (uid 500):
Filesystem blocks  quota limit grace files quota limit grace
/dev/sda11   1000*   500  1000 6days     3     0     0
$ ls -l
total 1068
-rw------- 1 root    root      7168 Dec 10 18:56 aquota.user
-rw-rw-r-- 1 student student 204800 Dec 10 18:58 bigfile1
-rw-rw-r-- 1 student student 409600 Dec 10 18:58 bigfile2
-rw-rw-r-- 1 student student 409600 Dec 10 19:01 bigfile3
drwx------ 2 root    root     16384 Dec 10 18:47 lost+found
-rwxr-xr-x 1 root    root     41216 Dec 10 18:52 more
```

Look closely at the file sizes.

7. Get rid of the line in `/etc/fstab`.