## Exercise 20.1: Using a File as a Disk Partition Image

In this first exercise, we are going to create a file that will be used as a container for a full hard disk partition image, and for all intents and purposes can be used like a real hard partition. In the following exercise, we will show how to put more than one partition on it and have it behave as an entire disk.

1. Create a file full of zeros 1 GB in length:

   ```
   $ dd if=/dev/zero of=imagefile bs=1M count=1024
   ```

   You can make a much smaller file if you like or do not have that much available space in the partition you are creating the file on.

2. Put a filesystem on it:

   ```
   $ mkfs.ext4 imagefile
   ```

   ```
   mke2fs 1.42.9 (28-Dec-2013)
   imagefile is not a block special device.
   Proceed anyway? (y,n) y
   Discarding device blocks: done
   .....
   ```

   Of course you can format with a different filesystem, doing **mkfs.ext3**, **mkfs.vfat**, **mkfs.xfs** etc.

3. Mount it somewhere:

   ```
   $ mkdir mntpoint
   $ sudo mount -o loop imagefile mntpoint
   ```

   You can now use this to your heart's content, putting files etc. on it.

4. When you are done unmount it with:

   ```
   $ sudo umount mntpoint
   ```

An alternative method to using the `loop` option to mount would be:

```
$ sudo losetup /dev/loop2 imagefile
$ sudo mount /dev/loop2 mntpoint
 ....
$ sudo umount mntpoint
$ sudo losetup -d /dev/loop2
```

We will discuss **losetup** in a subsequent exercise, and you can use `/dev/loop[0-7]` but you have to be careful they are not already in use, as we will explain.

You should note that using a loop device file instead of a real partition can be useful, but it is pretty worthless for doing any kind of measurements or benchmarking. This is because you are placing one filesystem layer on top of another, which can only have a negative effect on performance, and mostly you just use the behavior of the underlying filesystem the image file is created on.