1. Use fdisk -l to locate information about the partition sizes.

```
root@rhel:~# fdisk -l
Disk /dev/sdb: 1 GiB, 1073741824 bytes, 2097152 sectors
Disk model: PersistentDisk
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes


Disk /dev/sda: 20 GiB, 21474836480 bytes, 41943040 sectors
Disk model: PersistentDisk
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: gpt
Disk identifier: 49196753-D99E-476D-8CDC-2FB66AA36C57

Device      Start      End  Sectors  Size Type
/dev/sda1    2048   411647   409600  200M EFI System
/dev/sda2  411648 41940991 41529344 19.8G Linux filesystem
root@rhel:~#
```

2. Use fdisk to add a new logical partition that is 1GB in size.

```
root@rhel:~# fdisk /dev/sda

Welcome to fdisk (util-linux 2.37.4).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

This disk is currently in use - repartitioning is probably a bad idea.
It's recommended to umount all file systems, and swapoff all swap
partitions on this disk.


Command (m for help): n
Partition number (3-128, default 3):
First sector (34-41943006, default 41940992):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (41940992-41943006, default 41943006):

Created a new partition 3 of type 'Linux filesystem' and of size 1007.5 KiB.

Command (m for help): w
The partition table has been altered.
Syncing disks.
```

3. Did the kernel feel the changes? Display the content of /proc/partitions file? What did you notice? How to overcome that?

```
   8       16    1048576 sdb
   8        0   20971520 sda
   8        1     204800 sda1
   8        2   20764672 sda2
   8        3       1007 sda3
```

4. Make a new ext2 file system on the new logical partition you just created.
Bonus: Try creating the ext2 filesystem with 2k blocks and one inode per every 4k (two blocks) of filesystem.

```
root@rhel:~# mke2fs /dev/sda3
mke2fs 1.46.5 (30-Dec-2021)
Discarding device blocks: done
Creating filesystem with 1004 1k blocks and 128 inodes

Allocating group tables: done
Writing inode tables: done
Writing superblocks and filesystem accounting information: done
```

5. Create a directory, name it /data.

```
root@rhel:~# mkdir /data
root@rhel:~#
```

6. Add a label to the new filesystem, name it data.

```
root@rhel:~# mkfs -L data /dev/sda3
mke2fs 1.46.5 (30-Dec-2021)
/dev/sda3 contains a ext2 file system
        created on Sun Mar  5 03:22:35 2023
Proceed anyway? (y,N) y
Discarding device blocks: done
Creating filesystem with 1004 1k blocks and 128 inodes

Allocating group tables: done
Writing inode tables: done
Writing superblocks and filesystem accounting information: done
```

7. Add a new entry to /etc/fstab for the new filesystem using the label you just create.

```
root@rhel:~# blkid /dev/sda3
/dev/sda3: LABEL="data" UUID="4c04303f-2b1b-4795-bddf-e552bd5b0a2b" TYPE="ext2" PARTUUID="5cb30200-a0f6-2845-bb1f-cd896aeaa259"
```

```
#
# /etc/fstab
# Created by anaconda on Wed Nov  2 15:33:40 2022
#
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
UUID=4c04303f-2b1b-4795-bddf-e552bd5b0a2b  /data ext2  defaults 00
UUID=be9d4278-55f8-42ef-bc6b-dbfa90e4cc8a /                       xfs     defaults        0 0
UUID=DD0E-B8C8          /boot/efi               vfat    defaults,uid=0,gid=0,umask=077,shortname=winnt 0 2
```

8. Mount the new filesystem.

```
root@rhel:~# mount /dev/sda3 /data
```

9. Display your swap size.

```
root@rhel:~# free -h
               total        used        free      shared  buff/cache   available
Mem:           3.6Gi       537Mi       2.8Gi       8.0Mi       466Mi       3.0Gi
Swap:             0B          0B          0B
root@rhel:~#
```

10. Create a swap file of size 512MB.

```
root@rhel:~# free -h
               total        used        free      shared  buff/cache   available
Mem:           3.6Gi       537Mi       2.8Gi       8.0Mi       466Mi       3.0Gi
Swap:             0B          0B          0B
root@rhel:~# dd if=/dev/zero of=/myswap bs=1024 count=1024
1024+0 records in
1024+0 records out
1048576 bytes (1.0 MB, 1.0 MiB) copied, 0.00294763 s, 356 MB/s
root@rhel:~# mkswap /myswap
mkswap: /myswap: insecure permissions 0644, fix with: chmod 0600 /myswap
Setting up swapspace version 1, size = 1020 KiB (1044480 bytes)
no label, UUID=d0b346bb-2ffe-476d-8273-720ea51a74c0
root@rhel:~#
```

11. Add the swap file to the virtual memory of the system.

```
#
# /etc/fstab
# Created by anaconda on Wed Nov  2 15:33:40 2022
#
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
UUID=4c04303f-2b1b-4795-bddf-e552bd5b0a2b  /data ext2  defaults 0 0
/myswap swap swap defaults 0 0
UUID=be9d4278-55f8-42ef-bc6b-dbfa90e4cc8a /                       xfs     defaults        0 0
UUID=DD0E-B8C8          /boot/efi               vfat    defaults,uid=0,gid=0,umask=077,shortname=winnt 0 2
~
```

12. Display the swap size

```
root@rhel:~# swapon /myswap
swapon: /myswap: insecure permissions 0644, 0600 suggested.
swapon: /myswap: swapon failed: Device or resource busy
root@rhel:~# free -h
               total        used        free      shared  buff/cache   available
Mem:           3.6Gi       530Mi       2.8Gi       8.0Mi       467Mi       3.0Gi
Swap:          0.0Ki          0B       0.0Ki
root@rhel:~#
```