

Home Work – 1

1. All three surveys completed
2. Done.
3. Done
4. Done
5. Done
- 6.

```
shekhar@shekhar-VirtualBox:~/Downloads$ gcc --version
gcc version 5.4.0 20160609 (Ubuntu 5.4.0-6ubuntu1-16.04.4)
shekhar@shekhar-VirtualBox:~/Downloads$
```

```
shekhar@shekhar-VirtualBox:~/Downloads$ chmod 777 exam.sh
shekhar@shekhar-VirtualBox:~/Downloads$ ./exam.sh

***** User Information *****

Linux shekhar-VirtualBox 4.10.0-28-generic #32-16.04.2-Ubuntu SMP Thu Jul 20 10:19:48 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
uid=1000(shekhar) gid=1000(shekhar) groups=1000(shekhar),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),113(lpadmin),128(sambashare)

***** Linux OS Info *****

4.10.0-28-generic GNU/Linux
DISTRIB_ID=Ubuntu
DISTRIB_RELEASE=16.04
DISTRIB_CODENAME=xenial
DISTRIB_DESCRIPTION="Ubuntu 16.04.3 LTS"

Linux version 4.10.0-28-generic (build@lgw01-12) (gcc version 5.4.0 20160609 (Ubuntu 5.4.0-6ubuntu1-16.04.4) ) #32-16.04.2-Ubuntu SMP Thu Jul 20 10:19:48 UTC 2017

#32-16.04.2-Ubuntu SMP Thu Jul 20 10:19:48 UTC 2017

***** System Arch Info *****

x86_64

***** Memory Info *****

MemTotal:      4044232 kB
MemFree:       2093168 kB
MemAvailable:  2690420 kB
Buffers:       30472 kB

Cached:        764880 kB
SwapCached:    0 kB
Active:        1403680 kB
Inactive:      415060 kB
Active(anon):  1024252 kB
Inactive(anon): 15120 kB
Active(file):  379436 kB
Inactive(file): 399940 kB
Unevictable:   32 kB
Mlocked:       32 kB
SwapTotal:     4192252 kB
SwapFree:      4192252 kB
Dirty:         3948 kB
Writeback:     0 kB
AnonPages:     960960 kB
Mapped:        308848 kB
Shmem:         15980 kB
Slab:          65312 kB
SReclaimable:  41976 kB
SUnreclaim:    23336 kB
KernelStack:   7008 kB
PageTables:    28308 kB
NFS_Unstable:  0 kB
Bounce:        0 kB
WritebackTmp:  0 kB
CommitLimit:   6214368 kB
Committed_AS:  3954536 kB
VmallocTotal:  34359738367 kB
VmallocUsed:    0 kB
VmallocChunk:  0 kB
HardwareCorrupted: 0 kB
AnonHugePages: 172032 kB
ShmemHugePages: 0 kB
ShmemPmdMapped: 0 kB
CmaTotal:      0 kB
CmaFree:       0 kB

HugePages_Total: 0
HugePages_Free: 0
HugePages_Rsvd: 0
HugePages_Surp: 0
Hugepagesize:   2048 kB
DirectMap4k:    96192 kB
DirectMap2M:    4098048 kB

total      used      free      shared  buff/cache  available
Mem:       3949      1064      2044        15        840       2627
Swap:      4093          0      4093

shekhar@shekhar-VirtualBox:~/Downloads$
```

7.

```
shekhar@shekhar-VirtualBox:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            1.4G   0    1.4G   0% /dev
tmpfs           276M  4.6M  271M   2% /run
/dev/sda1       37G   4.4G   31G  13% /
tmpfs           1.4G  212K   1.4G   1% /dev/shm
tmpfs           5.0M   4.0K   5.0M   1% /run/lock
tmpfs           1.4G   0    1.4G   0% /sys/fs/cgroup
tmpfs           276M   96K   276M   1% /run/user/1000
shekhar@shekhar-VirtualBox:~$

shekhar@shekhar-VirtualBox:~$ dpkg --get-architecture | grep linux-image
ii linux-image-4.10.0-28-generic amd64 4.10.0-28.32~16.04.2
Linux kernel image for version 4.10.0 on 64 bit x86 SMP
ii linux-image-extra-4.10.0-28-generic amd64 4.10.0-28.32~16.04.2
Linux kernel extra modules for version 4.10.0 on 64 bit
x86 SMP
ii linux-image-generic-hwe-16.04 amd64 4.10.0.28.31
Generic Linux kernel image
shekhar@shekhar-VirtualBox:~$ ls -lha /boot
total 53M
drwxr-xr-x  3 root root 4.0K Jan 24 12:29 .
drwxr-xr-x 24 root root 4.0K Jan 24 12:12 ..
-rw-r--r--  1 root root 1.4M Jul 20 2017 abi-4.10.0-28-generic
-rw-r--r--  1 root root 201K Jul 20 2017 config-4.10.0-28-generic
drwxr-xr-x  5 root root 4.0K Jan 24 12:29 grub
-rw-r--r--  1 root root 40M Jan 24 12:29 initrd.img-4.10.0-28-generic
-rw-r--r--  1 root root 179K Jan 28 2016 memtest86+.bin
-rw-r--r--  1 root root 181K Jan 28 2016 memtest86+.elf
-rw-r--r--  1 root root 181K Jan 28 2016 memtest86+_multiboot.bin
-rw-r--r--  1 root root 3.6M Jul 20 2017 System.map-4.10.0-28-generic
-rw-r--r--  1 root root 7.1M Jan 24 12:09 vmlinuz-4.10.0-28-generic
```

8.

To build/setUp new kernel

sudo apt-get update

#get the linux kernel tar ball from the follwing URL with wgets

echo \$'\n Getting the Linux Kernel and Untaring \n'

wget https://cdn.kernel.org/pub/linux/kernel/v4.x/linux-4.14.13.tar.xz

Untar-ing the kernel

tar -xvf linux-4.14.13.tar.xz

```
# change directory to linux kernel
```

```
cd linux-4.14.13
```

```
# Configure the linux kernel
```

```
echo $'\nConfiguring Linux Kernel\n'
```

```
cp /boot/config-$(uname -r) .config
```

```
# a GUI pops up - which needs to be configured manually - its doing the same cp config  
command in GUI form
```

```
make menuconfig
```

```
echo $'\nbuilding Kernel.\n'
```

```
# Build the kernel
```

```
make -j 2
```

```
echo $'\nInstalling kernel modules\n'
```

```
# Install the kernel modules
```

```
make -j 2 modules_install
```

```
echo $'\nInstalling kernel\n'
```

```
# Copy kernel and .config file to /boot folder to generate system.map
```

```
make -j 2 install
```

```
echo $'\nKernel install done..few more steps\n'
```

to use new kernel after the next boot up

update-initramfs -c -k linux-4.14.13

for the GRUB to automatically look for the available kernels in /boot folder

update-grub

update-grub2

echo \$'\nKernel install done.\n'

To have this execute in the command line to a log file
type :

./my_build_kernel > build.log2