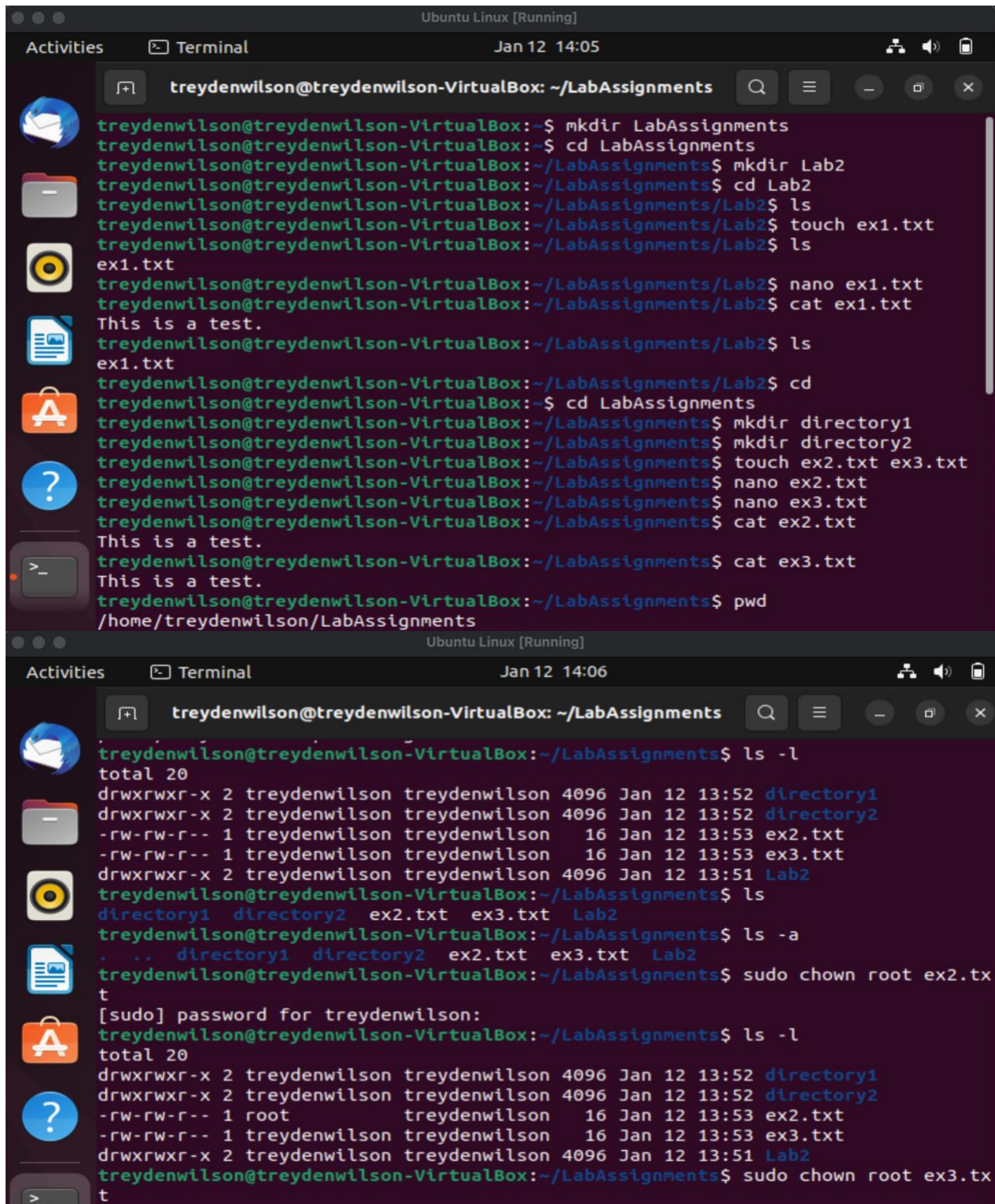


Treyden Wilson
Lab 2
CS 470 Operating Systems



The image shows two screenshots of a terminal window running Ubuntu Linux in a VirtualBox environment. The window title is "Ubuntu Linux [Running]" and the current directory is "~/LabAssignments".

Top Screenshot: The terminal shows the user creating a directory structure and files. The commands and output are as follows:

```
treydenwilson@treydenwilson-VirtualBox:~$ mkdir LabAssignments
treydenwilson@treydenwilson-VirtualBox:~$ cd LabAssignments
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ mkdir Lab2
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ cd Lab2
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments/Lab2$ ls
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments/Lab2$ touch ex1.txt
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments/Lab2$ ls
ex1.txt
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments/Lab2$ nano ex1.txt
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments/Lab2$ cat ex1.txt
This is a test.
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments/Lab2$ ls
ex1.txt
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments/Lab2$ cd
treydenwilson@treydenwilson-VirtualBox:~$ cd LabAssignments
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ mkdir directory1
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ mkdir directory2
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ touch ex2.txt ex3.txt
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ nano ex2.txt
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ nano ex3.txt
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ cat ex2.txt
This is a test.
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ cat ex3.txt
This is a test.
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ pwd
/home/treydenwilson/LabAssignments
```

Bottom Screenshot: The terminal shows the user listing files with long options and changing permissions. The commands and output are as follows:

```
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ ls -l
total 20
drwxrwxr-x 2 treydenwilson treydenwilson 4096 Jan 12 13:52 directory1
drwxrwxr-x 2 treydenwilson treydenwilson 4096 Jan 12 13:52 directory2
-rw-rw-r-- 1 treydenwilson treydenwilson  16 Jan 12 13:53 ex2.txt
-rw-rw-r-- 1 treydenwilson treydenwilson  16 Jan 12 13:53 ex3.txt
drwxrwxr-x 2 treydenwilson treydenwilson 4096 Jan 12 13:51 Lab2
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ ls
directory1 directory2 ex2.txt ex3.txt Lab2
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ ls -a
. .. directory1 directory2 ex2.txt ex3.txt Lab2
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ sudo chown root ex2.tx
t
[sudo] password for treydenwilson:
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ ls -l
total 20
drwxrwxr-x 2 treydenwilson treydenwilson 4096 Jan 12 13:52 directory1
drwxrwxr-x 2 treydenwilson treydenwilson 4096 Jan 12 13:52 directory2
-rw-rw-r-- 1 root treydenwilson  16 Jan 12 13:53 ex2.txt
-rw-rw-r-- 1 treydenwilson treydenwilson  16 Jan 12 13:53 ex3.txt
drwxrwxr-x 2 treydenwilson treydenwilson 4096 Jan 12 13:51 Lab2
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments$ sudo chown root ex3.tx
t
```

```

tretydenwilson@tretydenwilson-VirtualBox:~/LabAssignments$ ls -l
total 20
drwxrwxr-x 2 tretydenwilson tretydenwilson 4096 Jan 12 13:52 directory1
drwxrwxr-x 2 tretydenwilson tretydenwilson 4096 Jan 12 13:52 directory2
-rw-rw-r-- 1 root tretydenwilson 16 Jan 12 13:53 ex2.txt
-rw-rw-r-- 1 root tretydenwilson 16 Jan 12 13:53 ex3.txt
drwxrwxr-x 2 tretydenwilson tretydenwilson 4096 Jan 12 13:51 Lab2
tretydenwilson@tretydenwilson-VirtualBox:~/LabAssignments$ ls
directory1 directory2 ex2.txt ex3.txt Lab2
tretydenwilson@tretydenwilson-VirtualBox:~/LabAssignments$ cd Lab2
tretydenwilson@tretydenwilson-VirtualBox:~/LabAssignments/Lab2$ ls -l
total 4
-rw-rw-r-- 1 tretydenwilson tretydenwilson 16 Jan 12 13:51 ex1.txt
tretydenwilson@tretydenwilson-VirtualBox:~/LabAssignments/Lab2$ chmod u-rw ex1.tx
t
tretydenwilson@tretydenwilson-VirtualBox:~/LabAssignments/Lab2$ ls -l
total 4
----rw-r-- 1 tretydenwilson tretydenwilson 16 Jan 12 13:51 ex1.txt
tretydenwilson@tretydenwilson-VirtualBox:~/LabAssignments/Lab2$

```

Ubuntu Linux [Running]

Activities Terminal Jan 12 14:20

tretydenwilson@tretydenwilson-VirtualBox: ~/LabAssignme...

tretydenwilson@tretydenwilson-VirtualBox:~/LabAssignments/Lab2\$ lshw

WARNING: you should run this program as super-user.

tretydenwilson-virtualbox

- description: Computer
- width: 64 bits
- capabilities: vsyscall32
- *-core
 - description: Motherboard
 - physical id: 0
- *-memory
 - description: System memory
 - physical id: 0
 - size: 3GiB
- *-cpu
 - product: Intel(R) Core(TM) i7-8569U CPU @ 2.80GHz
 - vendor: Intel Corp.
 - physical id: 1
 - bus info: cpu@0
 - version: 6.142.10
 - width: 64 bits
 - capabilities: fpu fpu_exception wp vme de pse tsc msr pae mce cx8 api

c sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx rdtsc
p x86-64 constant_tsc rep_good nopl xtopology nonstop_tsc cpuid tsc_known_freq
pni pclmulqdq monitor ssse3 cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt aes xsa
ve avx rdrand hypervisor lahf_lm abm 3dnowprefetch invpcid_single pti fsgsbase
bmi1 bmi2 invpcid rdseed clflushopt md_clear flush_l1d arch_capabilities

description: Host bridge

Show Applications

```
Ubuntu Linux [Running]
Activities Terminal Jan 12 14:21
treydenwilson@treydenwilson-VirtualBox: ~/LabAssignme...

*-pci
  description: Host bridge
  product: 440FX - 82441FX PMC [Natoma]
  vendor: Intel Corporation
  physical id: 100
  bus info: pci@0000:00:00.0
  version: 02
  width: 32 bits
  clock: 33MHz
*-isa
  description: ISA bridge
  product: 82371SB PIIX3 ISA [Natoma/Triton II]
  vendor: Intel Corporation
  physical id: 1
  bus info: pci@0000:00:01.0
  version: 00
  width: 32 bits
  clock: 33MHz
  capabilities: isa bus_master
  configuration: latency=0
*-pnp00:00
  product: PnP device PNP0303
  physical id: 0
  capabilities: pnp
  configuration: driver=i8042 kbd
*-pnp00:01
  product: PnP device PNP0f03
  physical id: 1
  capabilities: pnp
```



```
Ubuntu Linux [Running]
Activities Terminal Jan 12 14:21
treydenwilson@treydenwilson-VirtualBox: ~/LabAssignme...

configuration: driver=i8042 kbd
*-pnp00:01
product: PnP device PNP0f03
physical id: 1
capabilities: pnp
configuration: driver=i8042 aux
*-ide
description: IDE interface
product: 82371AB/EB/MB PIIX4 IDE
vendor: Intel Corporation
physical id: 1.1
bus info: pci@0000:00:01.1
logical name: scsi1
version: 01
width: 32 bits
clock: 33MHz
capabilities: ide isa_compat_mode pci_native_mode bus_master emula
ted
configuration: driver=ata_piix latency=64
resources: irq:0 ioport:1f0(size=8) ioport:3f6 ioport:170(size=8)
ioport:376 ioport:d000(size=16)
*-cdrom
description: DVD reader
product: CD-ROM
vendor: VBOX
physical id: 0.0.0
bus info: scsi@1:0.0.0
logical name: /dev/cdrom
logical name: /dev/sr0

Ubuntu Linux [Running]
Activities Terminal Jan 12 14:21
treydenwilson@treydenwilson-VirtualBox: ~/LabAssignme...

capabilities: removable audio dvd
configuration: ansiversion=5 status=nodisc
*-display
description: VGA compatible controller
product: SVGA II Adapter
vendor: VMware
physical id: 2
bus info: pci@0000:00:02.0
logical name: /dev/fb0
version: 00
width: 32 bits
clock: 33MHz
capabilities: vga_controller bus_master rom fb
configuration: depth=32 driver=vmwgfx latency=64 resolution=2048,2
048
resources: irq:18 ioport:d010(size=16) memory:e0000000-e7ffffff me
mory:f0000000-f01fffff memory:c0000-dffff
*-network
description: Ethernet interface
product: 82540EM Gigabit Ethernet Controller
vendor: Intel Corporation
physical id: 3
bus info: pci@0000:00:03.0
logical name: enp0s3
version: 02
serial: 08:00:27:00:ef:25
size: 1Gbit/s
capacity: 1Gbit/s
width: 32 bits
```

```
Ubuntu Linux [Running]
Activities  Terminal  Jan 12 14:21
treydenwilson@treydenwilson-VirtualBox: ~/LabAssignme...

capacity: 1Gbit/s
width: 32 bits
clock: 66MHz
capabilities: bus_master cap_list ethernet physical tp 10bt 10bt-f
d 100bt 100bt-fd 1000bt-fd autonegotiation
configuration: autonegotiation=on broadcast=yes driver=e1000 drive
rversion=5.15.0-56-generic duplex=full ip=10.0.2.15 latency=64 link=yes mingnt=
255 multicast=yes port=twisted pair speed=1Gbit/s
resources: irq:19 memory:f0200000-f021ffff ioport:d020(size=8)
*-generic
description: System peripheral
product: VirtualBox mouse integration
vendor: InnoTek Systemberatung GmbH
physical id: 4
bus info: pci@0000:00:04.0
logical name: input7
logical name: /dev/input/event6
logical name: /dev/input/js1
logical name: /dev/input/mouse2
version: 00
width: 32 bits
clock: 33MHz
capabilities: pci
configuration: driver=vboxguest latency=0
resources: irq:20 ioport:d040(size=32) memory:f0400000-f07fffff me
mory:f0800000-f0803fff
*-multimedia
description: Multimedia audio controller
product: 82801AA AC'97 Audio Controller
```

Ubuntu Linux [Running]

Activities Terminal Jan 12 14:22

treydenwilson@treydenwilson-VirtualBox: ~/LabAssignme...

```
description: Multimedia audio controller
product: 82801AA AC'97 Audio Controller
vendor: Intel Corporation
physical id: 5
bus info: pci@0000:00:05.0
logical name: card0
logical name: /dev/snd/controlC0
logical name: /dev/snd/pcmC0D0c
logical name: /dev/snd/pcmC0D0p
logical name: /dev/snd/pcmC0D1c
version: 01
width: 32 bits
clock: 33MHz
capabilities: bus_master
configuration: driver=snd_intel8x0 latency=64
resources: irq:21 ioport:d100(size=256) ioport:d200(size=64)

*-usb
description: USB controller
product: KeyLargo/Intrepid USB
vendor: Apple Inc.
physical id: 6
bus info: pci@0000:00:06.0
version: 00
width: 32 bits
clock: 33MHz
capabilities: ohci bus_master cap_list
configuration: driver=ohci-pci latency=64
resources: irq:22 memory:f0804000-f0804fff

*-bridge
```

```
Ubuntu Linux [Running]
Activities Terminal Jan 12 14:22
treydenwilson@treydenwilson-VirtualBox: ~/LabAssignme...

resources: irq:22 memory:f0804000-f0804fff
*-bridge
description: Bridge
product: 82371AB/EB/MB PIIX4 ACPI
vendor: Intel Corporation
physical id: 7
bus info: pci@0000:00:07.0
version: 08
width: 32 bits
clock: 33MHz
capabilities: bridge
configuration: driver=piix4_smbus latency=0
resources: irq:9
*-sata
description: SATA controller
product: 82801HM/HEM (ICH8M/ICH8M-E) SATA Controller [AHCI mode]
vendor: Intel Corporation
physical id: d
bus info: pci@0000:00:0d.0
version: 02
width: 32 bits
clock: 33MHz
capabilities: sata ahci_1.0 bus_master cap_list
configuration: driver=ahci latency=64
resources: irq:21 ioport:d240(size=8) ioport:d248(size=4) ioport:d
250(size=8) ioport:d258(size=4) ioport:d260(size=16) memory:f0806000-f0807fff
*-input:0
product: Power Button
physical id: 1
```



```
Ubuntu Linux [Running]
Activities Terminal Jan 12 14:22
treydenwilson@treydenwilson-VirtualBox: ~/LabAssignme...

bus info: pci@0000:00:0d.0
version: 02
width: 32 bits
clock: 33MHz
capabilities: sata ahci_1.0 bus_master cap_list
configuration: driver=ahci latency=64
resources: irq:21 ioport:d240(size=8) ioport:d248(size=4) ioport:d
250(size=8) ioport:d258(size=4) ioport:d260(size=16) memory:f0806000-f0807fff
*-input:0
product: Power Button
physical id: 1
logical name: input0
logical name: /dev/input/event0
capabilities: platform
*-input:1
product: Sleep Button
physical id: 2
logical name: input1
logical name: /dev/input/event1
capabilities: platform
*-input:2
product: AT Translated Set 2 keyboard
physical id: 3
logical name: input2
logical name: /dev/input/event2
logical name: input2::capslock
logical name: input2::numlock
logical name: input2::scrolllock
capabilities: i8042
```


Ubuntu Linux [Running]

Activities Terminal Jan 12 14:22

treydenwilson@treydenwilson-VirtualBox: ~/LabAssignme...

```
logical name: /dev/input/event2
logical name: input2::capslock
logical name: input2::numlock
logical name: input2::scrolllock
capabilities: i8042
*-input:3
  product: ImExPS/2 Generic Explorer Mouse
  physical id: 4
  logical name: input4
  logical name: /dev/input/event4
  logical name: /dev/input/mouse0
  capabilities: i8042
*-input:4
  product: Video Bus
  physical id: 5
  logical name: input5
  logical name: /dev/input/event3
  capabilities: platform
*-input:5
  product: VirtualBox USB Tablet
  physical id: 6
  logical name: input6
  logical name: /dev/input/event5
  logical name: /dev/input/js0
  logical name: /dev/input/mouse1
  capabilities: usb
WARNING: output may be incomplete or inaccurate, you should run this program as
super-user.
treydenwilson@treydenwilson-VirtualBox:~/LabAssignments/Lab2$
```