CS4375-13948 Fall 2023
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Homework Report
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HW 1: Introduction to xv6

Please replace red text with your report text and any tables or figures, names of any accompanying files, etc. Remember to commit all the files for your lab submission, to put the URL for your private xv6 repo in the Teams assignment, to submit the Teams assignment, and to give the instructor and TA access to your repo.

Task 1. Boot xv6 and explore utilities

I used the Windows Subsystem for Linux- WSL 2

```
ke: *** No rule to make target 'qemu'.  Stop.
tshering@DESKTOP-20BNCM1:~$ sudo apt-get install git build-essential gdb-multiarch qemu-system-misc gcc-riscv64-linux-gnu binutils-riscv64-linux-gnu
udo] password for sstshering:
ading package lists... Done
ilding dependency tree... Done
ading state information... Done
ild-essential is already the newest version (12.9ubuntu3).
c-riscv64-linux-gnu is already the newest version (4:11.2.0-1ubuntu1).
nutils-riscv64-linux-gnu is already the newest version (2.38-4ubuntu2.3).
t is already the newest version (1:2.34.1-1ubuntu1.10).
mu-system-misc is already the newest version (1:6.2+dfsg-2ubuntu6.13).
b-multiarch is already the newest version (12.1-0ubuntu1~22.04).
upgraded, 0 newly installed, 0 to remove and 91 not upgraded.
tshering@DESKTOP-20BNCM1:~$ git clone --bare https://github.com/mooresv/xv6-riscv-labs.git
tal: destination path 'xv6-riscv-labs.git' already exists and is not an empty directory.
tshering@DESKTOP-20BNCM1:~$ cd OS-riscv-xv6.git
ash: cd: OS-riscv-xv6.git: No such file or directory
```

Select sstshering@DESKTOP-20BNCM1: ~/OS-riscv-xv6

```
sstshering@DESKTOP-20BNCM1:/home$ ls
sstshering
sstshering@DESKTOP-20BNCM1:/home$ cd sstshering/
sstshering@DESKTOP-20BNCM1:~$ git clone https://github.com/sstshering/OS-riscv-xv6.git
Cloning into 'OS-riscv-xv6'...
remote: Enumerating objects: 7035, done.
remote: Counting objects: 100% (7035/7035), done.
remote: Compressing objects: 100% (3364/3364), done.
remote: Total 7035 (delta 3660), reused 7035 (delta 3660), pack-reused 0
Receiving objects: 100% (7035/7035), 17.22 MiB | 1.50 MiB/s, done.
Resolving deltas: 100% (3660/3660), done.
sstshering@DESKTOP-20BNCM1:~$ cd OS-riscv-xv6/
sstshering@DESKTOP-20BNCM1:~/OS-riscv-xv6$ ls
LICENSE  Makefile  README  kernel  mkfs  user
sstshering@DESKTOP-20BNCM1:~/OS-riscv-xv6$ make qemu
riscv64-linux-gnu-gcc    -c -o kernel/entry.o kernel/entry.S
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/start.o kernel/start.c
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/console.o kernel/console.c
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/printf.o kernel/printf.c
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/uart.o kernel/uart.c
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/kalloc.o kernel/kalloc.c
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/spinlock.o kernel/spinlock.c
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/string.o kernel/string.c
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/main.o kernel/main.c
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/vm.o kernel/vm.c
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/proc.o kernel/proc.c
riscv64-linux-gnu-gcc    -c -o kernel/swtch.o kernel/swtch.S
riscv64-linux-gnu-gcc    -c -o kernel/trampoline.o kernel/trampoline.S
riscv64-linux-gnu-gcc -Wall -Werror -O -fno-omit-frame-pointer -ggdb -MD -mcmodel=medany -ffreestanding -fno-common -nostdlib -mno-relax -I. -fno-stack-protector -fno-pie -
no-pie   -c -o kernel/trap.o kernel/trap.c
```

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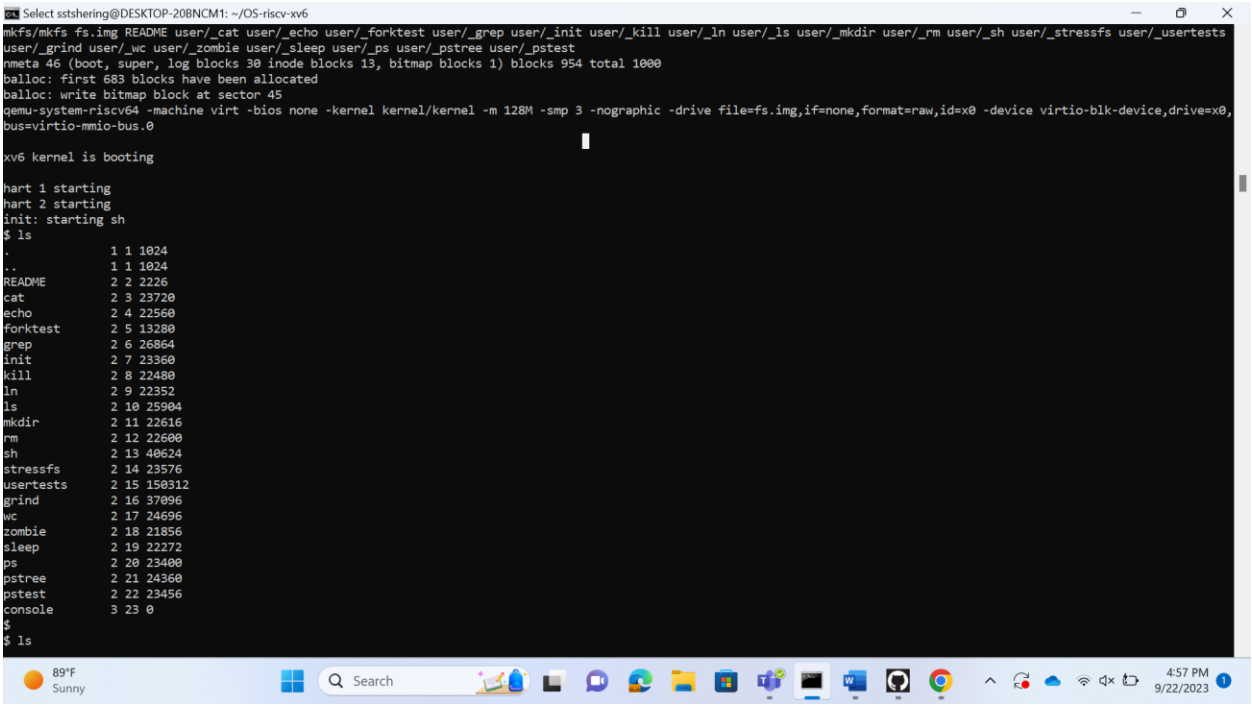
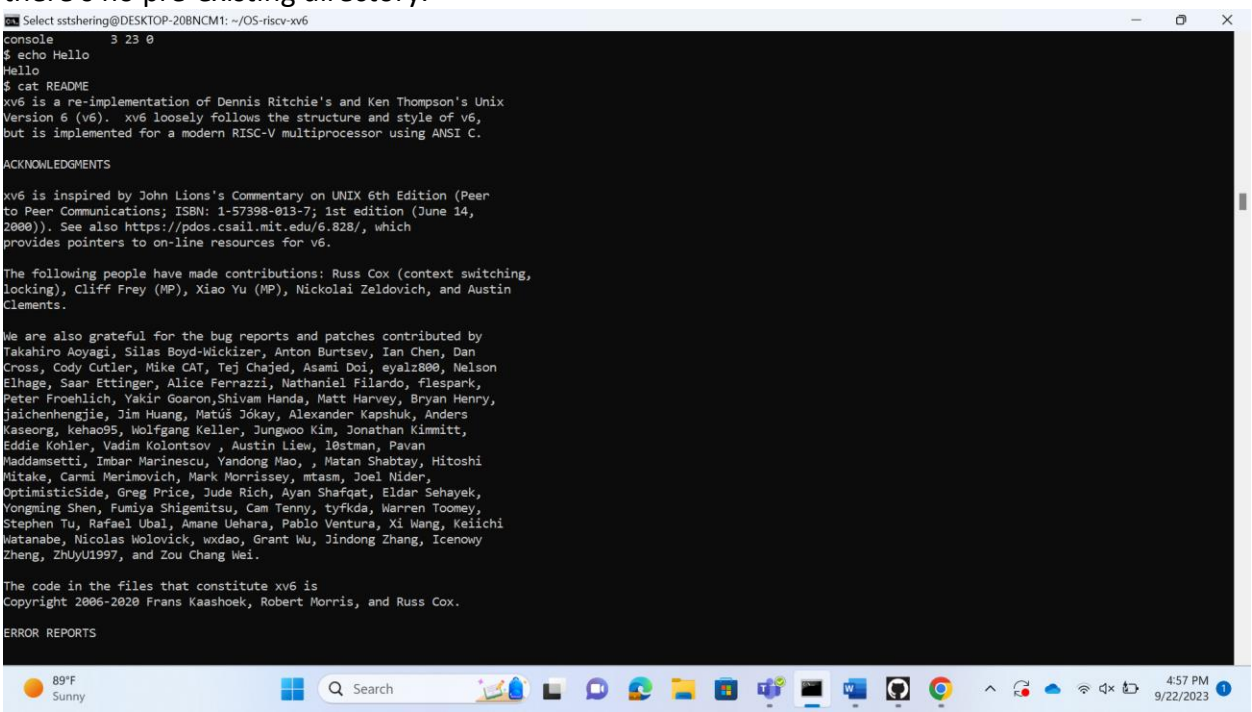


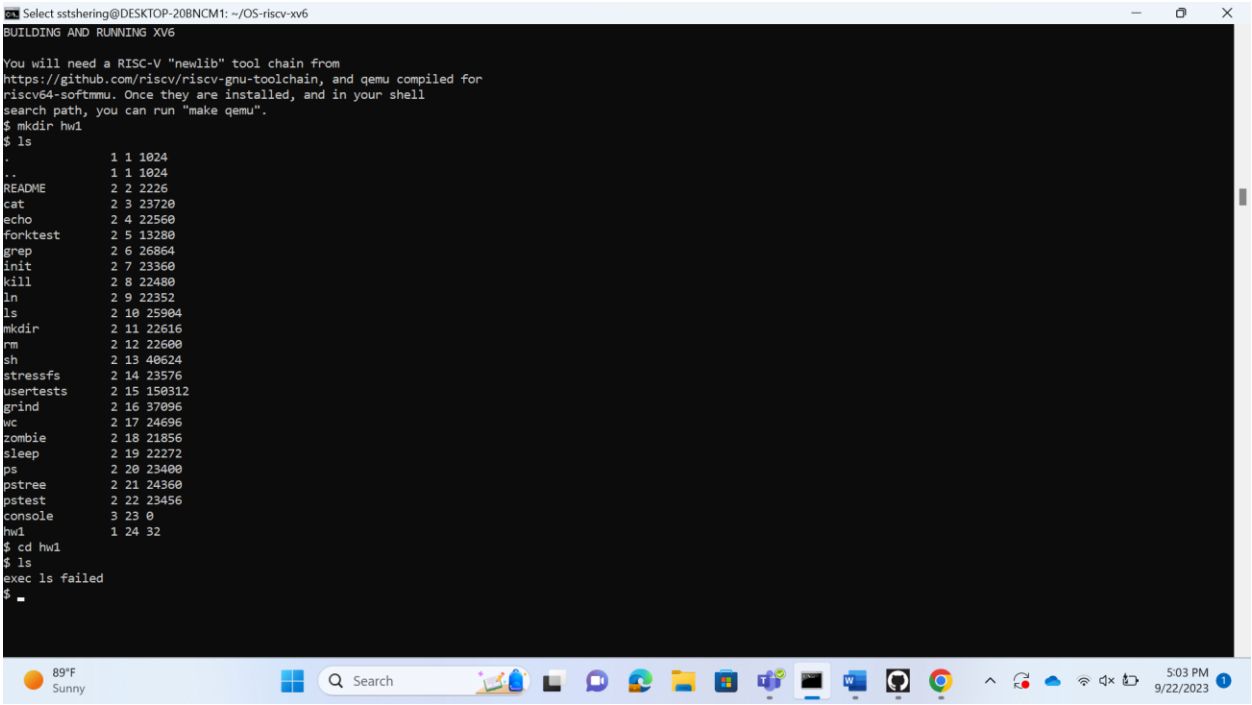
I explored echo, cat and mkdir commands.

echo is used to print message to the terminal. It takes the text use types in and prints it to the terminal.

cat is used to concatenate and display the contents of the file(s). It reads the contents of the mentioned file by user and displays it to the terminal. For example, I did cat README file.

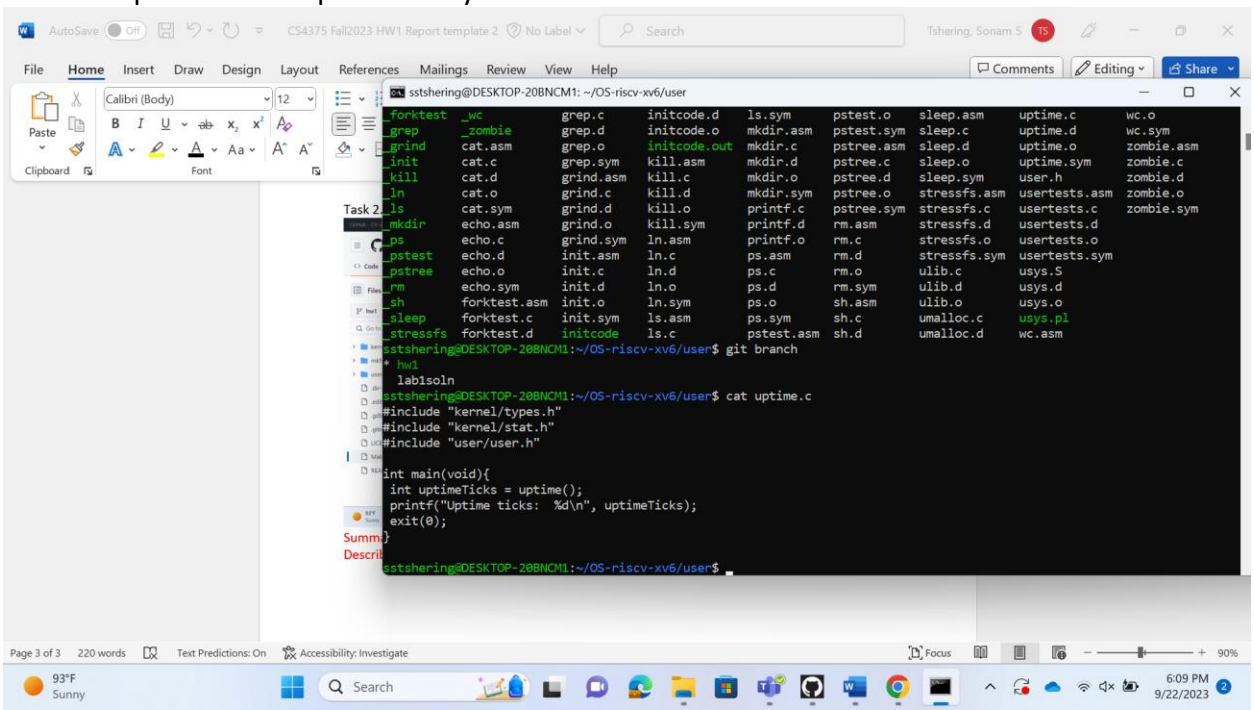
mkdir is used to create a new directory/folder. It follows the directory's name and creates it if there's no pre-existing directory.

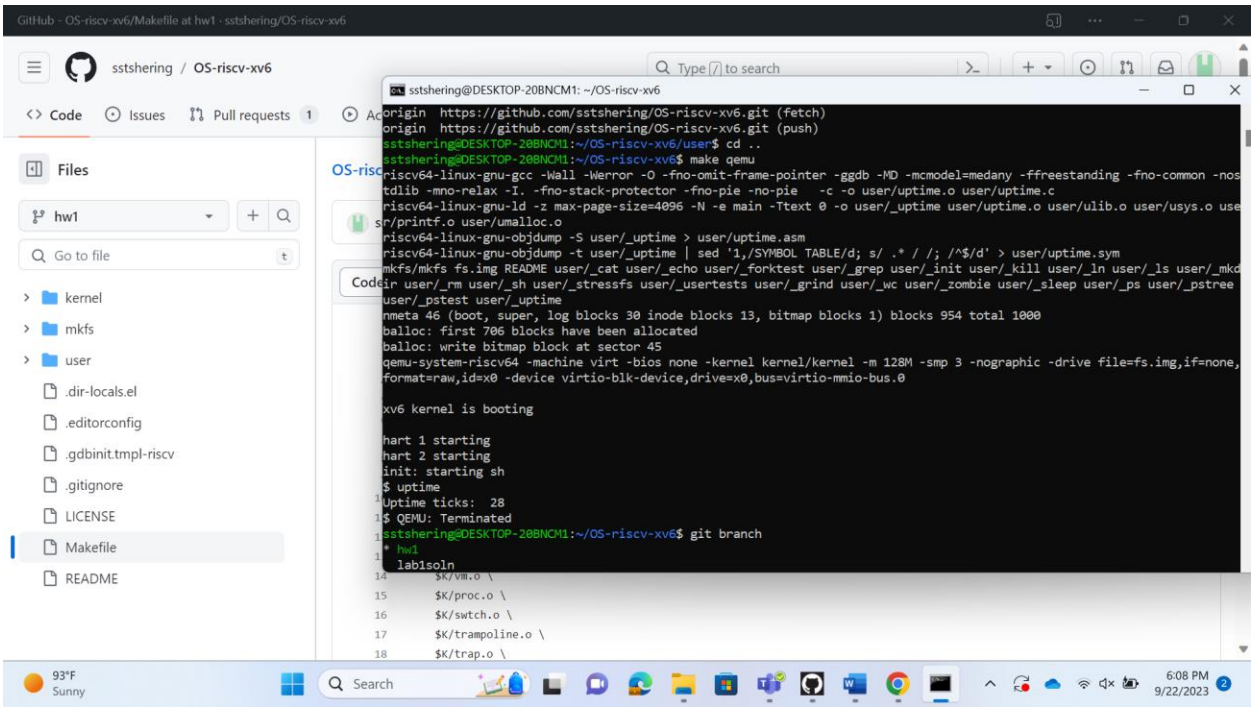




The most difficulties I faced was cloning the repo and getting it onto my ubuntu.

Task 2. Implement the uptime utility





I learned mainly how to git pull, push and commit between local and remote repo. Besides that, learned about how to implement uptime on xv6.

I was able to push my hw1 branch to the origin but the new updates I did on here weren't showing up on the local repository. But everything ran, I was able to run it on xv6 shell.