CS 273 (Operating Systems), Fall 2020, R. Brown

Homework 8   Due Monday, 10-12-20

A. **Review - FILE I/O**

1. Create a C program `appendfile.c` that behaves like `copyfile.c` except that it *appends* the first file *to the end* of the second file.

   The first file must exist before you run your program. If the second file exists and is non-empty, your program should add the lines in the first file to the end of that second file, preserving the prior contents of that second file.

2. Create a git `commit` containing your work on this segment.
        % git add appendfile.c
        % git commit -m "HW8 A complete: appendfile.c"
   Note. If your work on this segment is not yet complete, indicate the status of your work so far in the `commit` message. As you complete more of this work, create additional `commits`, using the `commit` messages to indicate your progress.

B. **Paging**

   p.255 22, 41 [1]

   p.256 30, 36

   Note: p256 #36 is an example exam-like problem.

C. **Virtual machines**

1. Complete any remaining steps of the *Virtual Box* lab

   https://www.stolaf.edu/people/rab/os/vbox.html

   on your laptop.

   Did this lab succeed for you? Indicate your answer as a by-hand submission

   - **Note:** Several Mac users reported difficulties starting VMs (virtual machines) using the Virtual Box user interface. See Piazza post 36
     https://piazza.com/class/ke1gmozq2uq39a?cid=36
     for a command to start your virtual machine on the command line of a Mac terminal.
     (You can use the Virtual Box user interface for creating and configuring your VM, just not starting it.)

2. Carry out these steps using your virtual machine

   a) Start up your virtual machine.

   b) Log in using your privileged user account.

   c) Install `emacs`
           sudo apt update
           sudo apt install emacs26

---

[1] Assume that different segments may not share the same page.

d) **Take a screenshot** (or phone picture) of your VM window, showing the final output from the last install command. Submit that image as by-hand work.

e) Log out of your privileged account, then login to the unprivileged user account you created as part of the Lab.

f) Start a terminal window, and start up `emacs`.

g) **Take a screenshot** (or phone picture) of your VM window, showing your emacs editor. Submit that image as by-hand work.

h) Enter the following C program `sumsqs2.c` in `emacs` (or another editor of your choice) on your VM.

```
/* sumsqs2.c - example of a function call in C language.  RAB 11/19 */

#include <stdio.h>

int square(int x) {
  return x*x;
}

int main() {
  int n;
  int result = 0;
  int i;

  printf("Enter a positive integer:  ");
  scanf("
  i = 0;
  while (i <= n) {
    result = result + square(i);
    i++;
  }

  printf("The sum of the first   return 0;
}
```

i) Compile and run the program `sumsqs2.c` in your VM's terminal window.

j) **Take a screenshot** (or phone picture) of your VM window, showing a successful compilation and run of the program. Submit that image as by-hand work.

k) Log out of your unprivileged account.

D. **Prep for recompiling the kernel.**

Log into your virtual machine as the privileged user. Then download and unpack the Linux kernel as described at this URL:
`https://www.stolaf.edu/people/rab/os/20201009.html#linux-source`

E. **Submission**

To submit by-hand parts, you can use the page `https://www.stolaf.edu/people/rab/os/asgt/hw8+.html`