Advanced Operating Systems(Spring 99)
Instructor: Prof. Nasser Yazdani
Homework #1

In this homework, you will work and be familiar with Unix/Linux shell. Shell is extremely important in using/managing a system and you can do most of your problems with only few line of shell commands.

1. Implement wc (word count) of Unix. Then, use your program to write a shell script to examine the content of some files and show the result in a nice format with appropriate headers. Then, sort the result based on the size of file and show the result in the screen with a nice format.

2. Write a shell script e2.sh that checks whether a user whose name you enter has a directory in the system home directory.

3. Write a shell script file named e3.sh that makes a list of files in your home directory that were changed less than 24 hours ago, but leave out directories.

4. Write a shell script that accepts two positive integer values from the user and prints out Greatest Common Divisor (GCD) of them. (e4.sh)

5. Make a zombie script. Usually we can terminate a shell script with Ctrl-C. But we can also *trap* user input generated signals and act on them. Here is an example:

```
#!/bin/bash  trap "echo You typed Ctrl-C; exit 1"  2
      # Signal 2 is Ctrl-C while
[ 1 ] do       echo I am
in an infinite loop
sleep 5
done
```

Can you make a zombie process which is not killed by Ctrl-C but makes a copy of itself before dying? How would we ever kill such a process?

6. Write a shell script to allow you to kill processes based on criterion of CPU usage, total running time, UID, etc. Think of this as a tool for a system administrator to use for stopping unwanted processes in a clear and well-designed manner.

Individual extra credit is available for implementing other features beyond those described.

Submitting your work

First, create at least two documents for each question the former is shell script file and the latter is its documentation. Copy all materials into one folder which named as "Your Name + Student No." and make a rar file.