CSCE 3600: Systems Programming

Minor Assignment 2 – Writing Bash Scripts

Due: 11:59 PM on Monday, February 28, 2022

SCRIPT DESCRIPTION:

Write a complete bash script that monitors the number of processes per user on the current CSE Linux machine (e.g., `cse01`, `cse02`, etc.) where the script is running. You will count all processes and total them per user every 5 seconds and report each user ID with the number of processes running during that time frame. Note this will include system processes. If the user enters a list of user IDs as arguments to the program it should only report processes for those users. In addition, you will install a custom signal handler to trap the SIGINT (i.e., ^C). This signal handler should prompt the user if they really want to exit. If they enter "Y" or "y", your program should exit. If anything else is entered, the program should continue to run.

You will also print out the current date and time, a heading before listing the users and process count followed by a line containing the total number of users and total number of processes running. The User ID column and the Count column should line up to look nice. Add a blank line between each output to make it easier to see each report.

Please see the **SAMPLE OUTPUT** for several examples, including the different scenarios that might occur.

REQUIREMENTS:

- Your script should be well documented with comments. For e.g., good comments consist of a header (with your name, course section, date, and brief description), comments for each variable, and commented blocks of code.
- Your bash script should be named **`minor2.sh`**. *Note that this must be done as a bash script, not a C program.*
- Your script will be graded based largely on whether it works correctly on the CSE machines (e.g., `cse01`, `cse02`, …, `cse06`), so you should make sure that your script runs on a CSE machine.
- Pay attention to the **SAMPLE OUTPUT** for how this script is expected to work. If you have any questions about this, please contact your instructor or TAs assigned to this course to ensure you understand these directions.
- <u>This is an individual programming assignment that must be the sole work of the individual student. Any instance of academic dishonesty will result in a grade of "F" for the course, along with a report filed into the Academic Integrity Database.</u>

SAMPLE OUTPUT (user input shown in **bold**):

```
$ ./minor2.sh root uuidd WDJ0017
```

```
Sun 20 Feb 2022 11:19:06 PM CST
User ID                     Count
root                           92
wdj0017                         8
uuidd                           1
3 USERS, TOTAL PROCESSES   101

Sun 20 Feb 2022 11:19:11 PM CST
User ID                     Count
root                           92
wdj0017                         8
uuidd                           1
3 USERS, TOTAL PROCESSES   101
^C (SIGINT) received
 Terminate Program? (Y/N) n
Continuing Execution

Sun 20 Feb 2022 11:19:16 PM CST
User ID                     Count
root                           90
wdj0017                         8
uuidd                           1
3 USERS, TOTAL PROCESSES    99

Sun 20 Feb 2022 11:19:21 PM CST
User ID                     Count
root                           90
wdj0017                         8
uuidd                           1
3 USERS, TOTAL PROCESSES    99
^C (SIGINT) received
 Terminate Program? (Y/N) Y
Terminating program

$ ./minor2.sh
Sun 20 Feb 2022 11:21:34 PM CST
User ID                     Count
lightdm                        14
cth0124                         2
pcp0019                         4
root                          104
cjh0372                         2
colord                          1
rtkit                           1
hhh0028                        10
vsb0030                         6
gst0031                         2
fbg0007                         5
eee0086                         2
statd                           1
shd0033                         3
```

```
ga0221                           6
sd0683                           2
mel0220                          6
aas0376                          4
an0548                           7
rk0423                          12
jl0844                          12
gj0099                          14
systemd-resolve                  1
systemd-timesync                 1
pam0196                          4
nmp0081                          1
dmg0151                          6
kas0499                          3
aaa0694                          1
rjp0109                          4
mba0096                          2
vg0254                           7
nkn0021                          7
tn0188                           7
sn0508                           2
bb0472                           2
wdj0017                          8
ima0041                          3
ajs0403                          4
pk0316                           6
uuidd                            1
rte0023                          1
at0733                           2
sshd                             2
lam0518                          2
fk0071                           5
at0747                           2
rwa0048                          2
ksg0102                          4
ao0291                           2
50 USERS, TOTAL PROCESSES   312

Sun 20 Feb 2022 11:21:39 PM CST
User ID                     Count
lightdm                        14
cth0124                         2
pcp0019                         4
root                          104
cjh0372                         2
colord                          1
rtkit                           1
hhh0028                        10
vsb0030                         6
gst0031                         2
fbg0007                         5
eee0086                         2
```

```
statd                            1
shd0033                          3
ga0221                           6
sd0683                           2
mel0220                          6
aas0376                          4
an0548                           7
rk0423                          12
jl0844                          12
gj0099                          14
systemd-resolve                  1
systemd-timesync                 1
pam0196                          5
nmp0081                          1
dmg0151                          6
kas0499                          3
aaa0694                          1
rjp0109                          4
mba0096                          2
vg0254                           7
nkn0021                          7
tn0188                           7
sn0508                           2
bb0472                           2
wdj0017                          8
ima0041                          3
ajs0403                          4
pk0316                           6
uuidd                            1
rte0023                          1
at0733                           2
sshd                             1
lam0518                          2
fk0071                           5
at0747                           2
rwa0048                          2
ksg0102                          4
ao0291                           2
50 USERS, TOTAL PROCESSES   312
^C (SIGINT) received
 Terminate Program? (Y/N) Y
Terminating program
```

SUBMISSION:

- You will electronically submit your bash script to the **Minor Assignment 2** dropbox in Canvas by the due date.