ICS 2305: Systems Programming

Assignment one

Please submit the assignment as zipped file with scripts to Jkuatnotes2@gmail.com before midnight of 16th October 2023
The subject of the Email should be: ICS2305ASS1: YourStudentNumber: YourName

I hope you have installed Linux and C programming environment on it. Avoid copying , Read and consult then do your own work

Ensure that the write up is well done and Please attach the zipped file with your source codes. Ensure that every of your code has comments to explain any working. Include your name and student number in the code at the top

Any work submitted after the deadline will not be marked and will earn no mark …not even a zero. ANY ONE who copies or shares his work with friends will result to punitive action as per JKUAT exam regulations

Reading

In Linux, whenever the user press ctrl+c , a signal SIGINT is sent to the process, Read about various signals such as and how the can be implemented in C programming

```
#define SIGHUP  1   /* Hangup the process */
#define SIGINT  2   /* Interrupt the process */
#define SIGQUIT 3   /* Quit the process */
#define SIGILL  4   /* Illegal instruction. */
#define SIGTRAP 5   /* Trace trap. */
#define SIGABRT 6   /* Abort. */
```

FOR SUBMISSION

Question 1.

a) Write a C program that prints the process ID , priorities and parent ID of all programs currently in the RAM

b) Create a Shell Script called "NYONGA" , while the Shell is open , Write a program in C that kills the open shell Script

c) Write a C program that uses the fork () API to create a child process.

d) Describe in prose how *waitpid*() (and *wait*()) works . Write a C program that

uses a.

waitpid()

b. and

wait())

APIs to get the termination status of a child in the parent .

e) In Linux tools such as **sysstat , sar and Nmon can be used to monitor CPU performance (Try them)**

In debian for instance to install sysstat you will run in terminal "sudo apt-get install sysstat").

We want to graph various CPU usages. We want to capture the CPU usage for few minutes and graph it.

Write a C program that incorporates a Graphical User Inteface (GUI) that graphs CPU usage in real time

f) Describe users defined signals with two working examples (Do not copy internet examples ..Create your own !

g) Write a Program that creates a text file called JUJU in drive C and create a signal that deletes the file 5 seconds after the creation and reports on prompt ..Hint :Knowledge of SIGALRM will be handy