Program #4

Simulation Project
Due: 4/29/16

Individual or Pairs project.

The final programming assignment is to write an OS simulation program.

Required elements:

- Simulation of the process scheduler with Round Robin, Priority, Shortest Job First.
  - Using processes entering the queue, user selected time quanta / parameters, generate the Gantt chart.
- Simulation of the memory management unit, TLB, page tables and paging.
  - The user will enter the memory size (number of frames) and the address size (number of pages).
  - The user will select the details about the paging unit (TLB size).
  - Using a reasonable model for memory accesses, demonstrate graphically how the memory access occurs. Compute effective memory access time due to TLB hits/misses.
- Simulation of the page replacement algorithms FIFO, Optimal, LRU, LFU, NRU.
  - Use auto-generated reference strings.
  - The user will select the algorithm, number of frames, and reference string details.
  - Output page faults.
- Cross platform GUI interface.

Solution method:

- Suggestion: Use Python-Tk. I will post sample code in the next few weeks.
- [Why Python-Tk? Tk is a very easy GUI to use. It is rather limited, but not as complicated as Qt or GTK. Python is very easy to use, Tk is ported to python (and not C) and is a good language to have seen.]

Testing:

- Again, try to break the code.
- Run on more than one OS.

Submission contents:

- Documentation
  - Complete description of the implementation.
    - You must document the author of each code segment.
  - Complete description of the testing.
  - Complete description of what the system requirements are, how to build, how to

    run and how to use the GUI.
    - Write up should discuss how this is used as simulation and as a teaching tool.
- Main programs.
- Any required external functions `*.c`.
- Any include files you use (other than the standard ones).
- The Makefile to build the program.

Grading approach:

- copy from the submit directory to my grading directory
- tar -xzf prog4.tgz
- cd prog4
- make
- *verify code*
- Program demo
- assign a grade
- cd ..
- rm -rf prog4

Submission method: You will use the submit page to submit your program. The files need to be tarred and gzipped prior to submission. Please empty the directory prior to tar/zip. [You will tar up the directory containing the files: `tar -czf prog4.tgz prog4` .]