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**Program 1 Design Questions**

**1.** What are the most **important aspects of a process mix** that could influence how well virtual memory (and page replacement algorithms) supports them?

VM performance is going to be most dependent on the following stack size (number of local variables, locality of reference), heap size (amount of dynamically allocated memory), repetition of references, CPU speed, page size, physical memory size, page frame size, fragmentation, and number of concurrent processes.

**2.** **Which** of these aspects **will you try to model** in the program that you write to generate input streams of page references?

We will allow users to model variations in stack size, heap size, and number of concurrent processes. We will try to do so using recursion, loops with malloc, and forking, respectively.

**3. How**will you allow users of your "front end" / Lab 4 / page reference stream generator program **to specify the characteristics of the process mix**?

We will allow users to communicate with Lab 4 via command line arguments. The aspects listed in **2** will be variable via flags, namely –s <stack-size> -h <heap-size> -p <processes>.

**4.** What simple "**research question**" would you like to investigate, for this project? This must be phrased in the form of a question. Simple uninteresting questions will earn "average" grades. Take what you know about virtual memory and try to find something for which you care about the answer. This does not have to be a straight comparison of page replacement algorithms; feel free to push the boundaries of the assignment and investigate other aspects of VM systems. (TLB effectiveness, effect of altering page sizes, something about superpages (although we have not talked about them in enough detail yet... and it might be more difficult, local vs. global algorithms, etc.))

We will investigate TLB performance. Specifically, starting at a stream with no repeated references and gradually increasing the amount of repetition, at what point is a TLB worth the overhead?

**5.** How will you **divide the work** among your group, and how frequently do you plan to meet/communicate? (Make a plan for success and describe it succinctly, please.)

We will work together using version control through GitHub. Our first in-person meeting will be March 15 at noon in the Marketplace. We will meet again on March 17 at 1:15 in lab. If more meetings are necessary, we will communicate such through Facebook group chat.