

Use C, C++, python or matlab to develop a program whose main routine accepts two parameters  $n$  and  $k$ , i.e. when you invoke your program from the shell, you pass it two parameters,  $n$  and  $k$ , where  $n \geq 16$  and  $k \geq 8$  and is in powers of 2 (e.g. 8, 16, 32, etc.). Your main routine shall generate a random page trace of length  $n$ , where the page numbers have values ranging from 0 to  $k - 1$ .

Develop a subroutine within your program that implements the FIFO page replacement algorithm (as a separate function within your program). The function shall accept a page trace and a parameter  $f$  for the number of frames allocated.

Your main routine shall then apply the random page trace to the subroutine implementing the page replacement algorithm, multiple times (using only one trace, randomly generated), passing a parameter  $f$  (number of page frames used) that ranges from 4 to  $k$ . Your main routine shall then record the number of page faults for each run (i.e. for each  $f$ ).

Run your program using a page trace of length  $n=64$ ,  $k=16$  (thus  $f$  ranges from 4 to 16). Plot and submit a graph displaying the number of faults vs the number of frames allocated.

Can your outcome exhibit the Belady's anomaly?