Hector Garcia-Molina
EE Quals Question 2007

The buffer manager for a file system keeps track of what
disk blocks have been read into memory.
When a new block is to be read, the manager must
select a buffer to hold the incoming data.
If no free space is available, the manage must first
select a buffer to flush.

(a) What strategies can the buffer manager
use to select a buffer to flush when space is needed?

(b) Consider a buffer manager that keeps track
of its buffers using a doubly linked list.
Each record in the list represents a buffer
and indicates what disk block is stored in that buffer.
The records are ordered by access time, where
global pointer NEW points to the record that represents
the most recently accessed buffer, and OLD points
to the record that represents the least recently accessed buffer.

Write pseudo-code for a procedure REGISTER(P) that
registers the fact that the buffer represented by record P
is now being accessed. Thus, record P which is already in the list
need to become the new NEW record at the top of the
doubly-linked list.