Methods of the Database Buffer

GET(Px):   returns a reference to Px

FIX(Px):   page Px may not be evicted anymore

UNFIX(Px):   page Px may be evicted
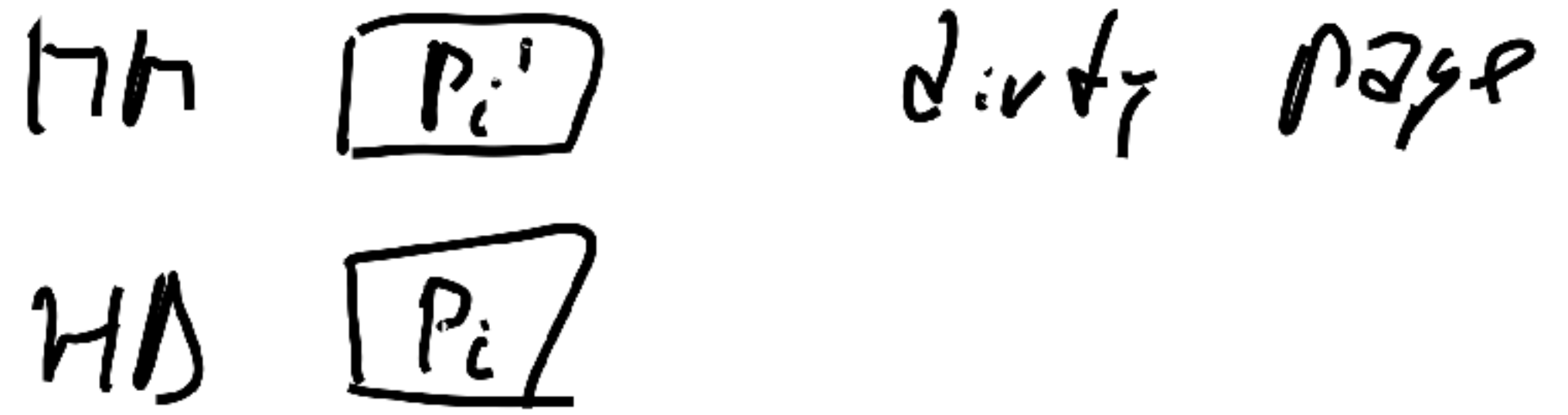
PAGE_IN_BUFFER(Px):   returns true, if buffer contains page Px

CHOOSE_PAGE():   chooses a page to evict and
                            returns a reference to page

Implementation of GET

RAM $\boxed{P_i'}$ dirty page

HD $\boxed{P_i}$

Get(Px):

1.   If (not PAGE_IN_BUFFER(Px)):   // check whether already exists
2.   if (no empty slot available in buffer):   // is there space to load a page?
3.   S = Pi = CHOOSE_PAGE();   // choose a page to kick out
4.   if (Pi is dirty):   // did anyone change this page?

Implementation of GET

Costs

Get(Px):

1. If (not PAGE_IN_BUFFER(Px)):   // check whether already exists
2.   if (no empty slot available in buffer):   // is there space to load a page?
3.   S = Pi = CHOOSE_PAGE();   // choose a page to kick out
4.   if (Pi is dirty):   // did anyone change this page?
5.   flush Pi to external memory; $\boxed{E}$ // oops, got to write it out first
6.   else: // we have space left anyway...
7.   S = getFreeSlot();   // pick a free page
8.   read(Px, S); $\boxed{E}$ // read Px into free slot
9. fix(Px);   // fix page Px
10. return Px;   // return a reference to Px

2 Random I/Os