

Buffer Manager

Decision tree for buffer manager trying to find page P with RID contents:

1. Free pages?
 - 1.1. Yes
 - 1.1.1. Choose free page P (as tiebreaker, choose first free page ordered alphanumerically)
 - 1.1.2. Put RID contents on P
 - 1.1.3. Return P
 - 1.2. No
 - 1.2.1. Is RID already in buffer?
 - 1.2.1.1. Yes
 - 1.2.1.1.1. Special case for CLOCK: set reference bit for P
 - 1.2.1.1.2. Return P (already with RID contents)
 - 1.2.1.2. No
 - 1.2.1.2.1. Run buffer replacement algorithm to get some page P
 - 1.2.1.2.2. Put RID contents on P
 - 1.2.1.2.3. Return P

CLOCK Replacement

Buffer replacement algorithm

```
CLOCK_bufferreplace() returns page P {  
    clockhand = clockhand->next  
    while (clockhand->reference == True) {  
        if (clockhand->pinned == False) {  
            clockhand->reference = False  
        }  
        clockhand = clockhand->next  
    }  
    evictcontents(clockhand)  
    return clockhand  
}
```

Notes

- Clock hand starts on first page ordered alphanumerically
- Clock hand only moves when running buffer replacement algorithm
- When starting buffer replacement algorithm, the clock hand should start considering unsetting reference bits from the page *immediately following* the one it just replaced on the previous invocation.
- Reference bits of pinned pages are never changed.
- Unpinning a page sets the reference bit because unpin operation needs to find the page in the buffer (refer to line 1.2.1.1.1 above)