Homework – Chapter 11

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1. Why is disk scheduling still highly relevant for solid state drives?

   For solid state drives, they operate better with random access rather than sequential access like HDDs, however it is still relevant to have scheduling algorithms for them in order to extend their life span.

2. Look-up technical specs for two 512GB solid state drives, find cheapest and most expensive on Newegg or some other favorite huckster. Report on the performance characteristics of these two drives, and compare and contrast any key differences. Is the more expensive drive worth it?

   Cheap drive:
   $76.99 | Read 515M/s Write 377M/s | cache size not listed
   Expensive drive:
   $1,428.04 | Read 500M/s Write 260M/s | cache size also not listed
       The price difference is not justified. The performance is worse on the more expensive drive, however, something that does not show in the specifications is how reliable the drives are. The more expensive one may be more reliable.

3. In part 2, one of your key specs *should* have included cache sizes. Why do SSD's need cache, anyway?

   They need a cache because of the abstraction between the OS and the hardware. OSs generally view any drive, HDD or SSD, as a HDD. Having a cache on the SSD allows operations intended for HDDs to work much faster.

4. Which one was faster, Alice's streams I/O or Bobby's mmap()?

   Bobby's mmap was faster, Alice's streams I/O had an average of 0.15 seconds. Bobby's mmap solution had an average time of 0.001 seconds.

5. Read about "stable" sorts, and explain why both of these two are twerps.

   Quicksort, a non-stable sort, has a worst case runtime of $O(n^2)$. Using a stable sort like mergesort means a worst case scenario of $O(n \log n)$.