Exercise 1

Time tip: Roughly 1min per 1pt
Exercise

Q1) [2 x 4pts] You are given a magnetic hard disk with \( x \) RPM and average seek time of \( y \) ms. The transfer rate is \( z \) MB/s. What is the average latency to read a contiguous 2MB on the same track for these given values of \((x,y,z)\)?

A. (6000 RPM, 5ms, 100 MB/s)
B. (12000 RPM, 2ms, 500 MB/s)
Q2) [4 x 6pts] You given a 3-frame buffer pool that is initially empty. You have 4 pages on disk: W, X, Y, Z. What is the disk I/O cost (in number of pages read/written) of the fulfilling the following sequence of page requests (all read-only)?
A. X, Y, Z, W, X, W; LRU
B. X, Y, Z, W, X, W; MRU
C. W, Z, Y, X, W, Z, Y, Z; LRU
D. W, Z, Y, X, W, Z, Y, Z; MRU
Q3) You are given a relation with all fixed length attributes. You store it in row-oriented layout as discussed in class. Let record size be 40 B; page size is 128 KB (1 KB = 1000 B). What is the largest number of full records you can store on one page with the following layout?

A. [4pts] Packed layout
B. [5pts] Unpacked layout