1 True and False

(a) When querying for an 16 byte record, exactly 16 bytes of data is read from disk.

(b) Writing to an SSD drive is more costly than reading from an SSD drive.

(c) In a heap file, all pages must be filled to capacity except the last page.

(d) Assuming integers take 4 bytes and pointers take 4 bytes, a slot directory that is 512 bytes can address 64 records in a page.

(e) In a page containing fixed-length records with no nullable fields, the size of the bitmap never changes.

Which of the following are true about the benefits of using a record header for variable length records?

(a) Does not need a delimiter character to separate fields in the records

(b) Always matches or beats space cost when compared to fixed-length record format

(c) Can access any field without scanning the entire record

(d) Has compact representation of null values

2 Fragmentation And Record Formats

(a) Is fragmentation an issue with packed fixed length record page format?

(b) Is fragmentation an issue with variable length records on a slotted page?

(c) We usually use bitmaps for pages with fixed-length records. Why not just use a slotted page for pages with fixed-length records?

3 Calculate the IOs

Assume we have a heap file A implemented with a page directory. One page in the directory can hold 16 page entries. There are 54 pages in file A in total.

(a) In the worst case, how many IOs are required to find a page with free space?

(b) In the worst case, how many IOs are required to write a record to a page with free space (assuming at least one free page exists)?