

1 True and False

- (a) When querying for an 16 byte record, exactly 16 bytes of data is read from disk. **False**
- (b) Writing to an SSD drive is more costly than reading from an SSD drive. **True**
- (c) In a heap file, all pages must be filled to capacity except the last page. **False**
- (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. **False**
- (e) In a page containing fixed-length records with no nullable fields, the size of the bitmap never changes. **True**

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 **True**
- (b) Always matches or beats space cost when compared to fixed-length record format **False**
- (c) Can access any field without scanning the entire record **True**
- (d) Has compact representation of null values **True**

2 Fragmentation And Record Formats

- (a) Is fragmentation an issue with packed fixed length record page format? **No**
- (b) Is fragmentation an issue with variable length records on a slotted page? **Yes**
- (c) We usually use bitmaps for pages with fixed-length records. Why not just use a slotted page for pages with fixed-length records? **Bitmaps have better space complexity**

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? **4 IOs**

- (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)? **7 IOs**