**CS150A Quiz02**

**File Formats**

Assume that each page in our system can hold 128 KB (1 KB = 1024bytes), integers are 32­bits wide, and bytes are 8­bits wide.

Consider the following relation:

CREATE TABLE Submissions (

record\_id integer UNIQUE,

assignment\_id integer,

student\_id integer,

time\_submitted integer,

grade\_received byte,

PRIMARY KEY (assignment\_id, student\_id)

);

Assume the column record\_id corresponds to the row's actual record ID.

**Q1**: How large (in bytes) is a record?

**Q2**: Suppose we begin each page with a 32­bytes header plus a bitmap. At most, how many records can fit in an unpacked page?

We add two variable­length fields to our table schema. Now our table looks like this:

CREATE TABLE Submissions (

record\_id integer UNIQUE,

assignment\_id integer,

student\_id integer,

time\_submitted integer,

grade\_received byte,

comment text,

regrade\_request text,

PRIMARY KEY (assignment\_id, student\_id)

);

We decide to use slotted pages to store the variable length records. Each page begins with a 32­bytes header plus a slot directory. (Assume this header contains information such as the number of valid records in the page.) Each pointer inside the slot directory consumes 20bits/record, while the record header storing field offsets is 32 bits wide.

**Q3**: What is the **maximum** number of records that can fit in our slotted pages?

**Q4**: We decide to squash the two text fields together into one field using a semicolon

separator character (;), which allows us to shrink the record header from 32 bits to 16

bits at the cost of 8 bits (for the semicolon). For example, the columns ("Submitted

late", "Dog ate my homework") get compressed into "Submitted late;Dog ate my

homework". Which of the following are true with this new scheme?

*Check all that apply.*

1. Professor Gonzales can enter the comment "Fantastic work; good job!"
2. Fewer records will fit in a page
3. More records will fit in a page
4. It is possible for the query "SELECT grade\_received FROM Submissions" to finish

faster