**CS150A Quiz03**

**Cost Model and Index Files**

Suppose we have an alternative 2 unclustered index on (assignment\_id, student\_id) with a depth

of 3 (one must traverse 3 index pages to reach any leaf page). Here's the schema:

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)

);

CREATE INDEX SubmissionLookupIndex

ON Submissions (assignment\_id, student\_id);

Assume the table takes up 12 MB on disk (1 MB = 1024 KB). (This includes extra space allocated

for future insertions.)

**Q1**: We want to scan all the records in Submissions. How many I/Os will this operation take?

**Q2**: UPDATE Students SET grade\_received=85

WHERE assignment\_id=20 AND student\_id=12345:

How many I/Os will this operation take?

**Q3**: In the best case, how many I/Os does it take to perform an equality search on grade\_received?

**Q4**: We want to speed up the process of looking up students' grades by student\_id, so

we will add an index to our current schema. Which of the following indices will help us

the most if each student submits many assignments?

Select the option which doesn't require any additional special assumptions about the

distribution of our data.

*Mark only one oval.*

1. Add an unclustered index on the key (record\_id, student\_id)
2. Add a clustered index on (student\_id, time\_submitted)
3. Add a clustered index on grade\_received
4. Add an unclustered index on student\_id