

CIS 717.2 Midterm Exam

You get 1/5th of the points if you leave an answer blank. You don't get points for a totally wrong answer. You might get partial credit for a partially correct answer.

1. Under what circumstances would you use a bitmap index, as opposed to another kind of index?
2. Under what circumstances would you want to use a clustered index? unclustered index?
3. Under what circumstances would you want to use a dense index? sparse index?
4. How does inner loop join work?
5. How does hash join work?
6. How does merge join work?
7. Under what circumstances would you use data partitioning (e.g.: oracle partitions).
8. (50 points); Write SQL, using the following schema:

```
employee(ename, street, city)
works(ename, cname, salary)
company(cname, city)
manages(ename, mname, cname)
```

- (a) Find 'John Doe's Manager's salary.
- (b) Find all employees in the database who live in the same cities and on the same streets as do their managers.
- (c) Find all employees who earn above average salary in their company.
- (d) Find the company that has the smallest payroll.
- (e) Find all of 'John Doe's subordinates (tip: use hierarchical query; e.g. connect by, start with, etc.)
- (f) Find the company with highest average salary, using analytical functions.
- (g) Write several update/insert/delete queries to "promote" John Doe at 'Some Big Corp'. He will get a 10% raise, report to his current manager's manager, and will manage 'Jack Johnson' and 'John Jackson' (who will no longer be managed by their current manager).
- (h) Find all telecommuting employees (assume that if employee doesn't live in the same city as the company, then they're telecommuting).
- (i) Find all employees whose salary is more than 2 standard deviations away from the average salary, and reduce their salary by 10%.
- (j) Find employees who work more than one job, and who are managers of folks who are their managers at a different company (e.g.: *A* is manager of *B* at corp1, and *B* is manager of *A* at corp2).

9. (15 points) For the following, use:

<i>branch-name</i>	<i>loan-number</i>	<i>amount</i>
Downtown	L-170	3000
Redwood	L-230	4000
Rerryridge	L-260	1700

loan

<i>customer-name</i>	<i>loan-number</i>
Jones	L-170
Smith	L-230
Hayes	L-155

borrower

- (a) Show result of “loan inner join borrower on loan number”.
- (b) Show result of “loan left outer join borrower on loan number”.
- (c) Show “loan natural inner join borrower”.
- (d) Show “loan natural right outer join”.
- (e) Show “loan full outer join borrower using (loan-number)”.