



臺中健康暨管理學院
九十三學年度碩士班招生考試試題紙

系所別	組別	考試科目	考試日期	時間	備註
生物資訊研究所碩士班	--	資料庫系統	93.5.3	13:30-15:10	共一頁

公告用

- Suppose the relation $R(A, B, C, D, E)$ with the functional dependencies $\{DE \rightarrow B, B \rightarrow E, CDE \rightarrow A, AB \rightarrow C\}$. (15 points)
 - What is (are) the candidate key(s) of R ?
 - Is R in BCNF? If not, which functional dependencies violate BCNF?
 - Transform the relational schema into a relational schema that is in BCNF and does not have any lost dependencies; if this is not possible decompose R into a schema that is in BCNF and has the fewest number of lost functional dependencies.
- Consider two systems, one supporting SQL, and the other supporting only relational algebra. (10 points)
 - Identify five operations supported by both of these systems.
 - Identify five significant differences between these systems.
- Most modern database systems ensure that transactions are serialisable by employing shared (read) and exclusive (write) locks to implement two phase commit. (25 points)
 - What is meant by a transaction?
 - What property do a serialisable sequence of updates have?
 - What is the difference between a shared and an exclusive lock?
 - What are the important properties of two phase commit?
 - When implementing two phase commit, how should a shared lock on something being read, become an exclusive lock on this thing, prior to it being updated?
- Consider the following relational database schema:
 $pizza(pid, pname, size), store(sname, phone, quality), soldby(pid, sname, price)$
Express each of the following queries in both the relational algebra and SQL: (50 points)
 - Find the name of all stores that sell both veggie and cheese pizza.
 - Find the names and phone numbers of all stores that sell good or excellent veggie pizza under \$10.
 - Find the names of all stores that do not sell veggie pizza.
 - List the average price of pizza for each quality level where the average is more than \$5.
 - List the stores whose average price for pizza is higher than the overall average price. The results should be presented in alphabetical order of store name.