# horizontal lineDatabase R&D Exercise

Assignment 5

I confirm that this is my own work and that use of material from other sources, including the Internet, has been properly and fully acknowledged and referenced.

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**Total in points** (100 points total): \_\_\_\_\_

**Professor’s Comments:**

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**6.10. Specify the following queries in SQL on the COMPANY relational database schema shown in Figure 5.5. Show the result of each query if it is applied to the COMPANY database in Figure 5.6.**

**a. Retrieve the names of all employees in department 5 who work more than 10 hours per week on the ProductX project.**

**Text

Description automatically generated with low confidence**

|  |  |
| --- | --- |
| FName | Lname |
| Join | Smith |
| Joyce | English |

**b. List the names of all employees who have a dependent with the same first name as themselves.**

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|  |  |
| --- | --- |
| FName | Lname |

**c. Find the names of all employees who are directly supervised by ‘Franklin Wong’.**

A picture containing graphical user interface

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|  |  |
| --- | --- |
| Fname | Lname |
| John | Smith |
| Ramesh | Narayan |
| Joyce | English |

**6.16. Write SQL statements to create a table EMPLOYEE\_BACKUP to back up the**

**EMPLOYEE table shown in Figure 5.6.**

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**8.20. Specify the following queries in relational algebra on the database schema given in Exercise 5.15:**

**a. Give the details (all attributes of trip relation) for trips that exceeded $2,000 in expenses.**

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**b. Print the Ssns of salespeople who took trips to Honolulu.**

**Text

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**c. Print the total trip expenses incurred by the salesperson with SSN = ‘234-56-7890’.**

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**8.27. In a tuple relational calculus query with n tuple variables, what would be the typical minimum number of join conditions? Why? What is the effect of having a smaller number of join conditions?**

n-1 join conditions. If having a smaller number, it means there exists a join function that does not have corresponding join condition. Then two relations will join directly by Cartesian product, which is meaningless.

**8.28. Rewrite the domain relational calculus queries that followed Q0 in Sec- tion 8.7 in the style of the abbreviated notation of Q0A, where the objective is to minimize the number of domain variables by writing constants in place of variables wherever possible.**

**Q1A:** {q, s, v | (∃z) (∃m)(EMPLOYEE(q,r,s,t,u,v,w,x,y,z) AND

DEPARTMENT(‘Research’,m,n,o) AND m=z)}

**Q2A:** {i, k, s, u, v | (∃m)(∃n)(∃t)(PROJECT(h, i, ‘Stafford’, k) AND EMPLOYEE(q, r, s, t, u, v, w, x, y, z) AND DEPARTMENT(l, m, n, o) AND k=m AND n=t)}

**Q6A:** {q, s | (∃t)(EMPLOYEE(q, r, s, t, u, v, w, x, y, z) AND

(NOT(∃l)(DEPENDENT(l, m, n, o, p) AND t=l)))}

**Q7A:** {s, q | (∃t)(∃j)(∃l)(EMPLOYEE(q, r, s, t, u, v, w, x, y, z) AND DEPARTMENT(h, i, j, k) AND DEPENDENT(l, m, n, o, p) AND t=j AND l=t)}

**8.33. State whether the following conclusions are true or false:**

**a. NOT (P(x) OR Q(x)) → (NOT (P(x)) AND (NOT (Q(x)))**

True. NOT (P(x) OR Q(x)) **→ (**NOT P(x)) AND (NOT (Q(x)))

**b. NOT (∃x) (P(x)) → ∀ x (NOT (P(x))**

True. NOT (∃x) (P(x)) → ∀ x (NOT (P(x))

**c. (∃x) (P(x)) → ∀ x ((P(x))**

False. (∃x) (P(x)) → NOT (∀ x) (NOT (P(x))