

CPSC 3131 / MISM 4135 - Assignment 4

Problem 1. Given the following business scenario, create a Crow's Foot ERD using a specialization hierarchy if appropriate. Granite Sales Company keeps information on employees and the departments that they work in. For each department, the department name, internal mail box number, and office phone extension are kept. A department can have many assigned employees, and each employee is assigned to only one department. Employees can be salaried employees, hourly employees, or contract employees. All employees are assigned an employee number. This is kept along with the employee's name and address. For hourly employees, hourly wage and target weekly work hours are stored (e.g., the company may target 40 hours/week for some, 32 hours/week for others, and 20 hours/week for others). Some salaried employees are salespeople who can earn a commission in addition to their base salary. For all salaried employees, the yearly salary amount is recorded in the system. For salespeople, their commission percentage on sales and commission percentage on profit are stored in the system. For example, John is a salesperson with a base salary of \$50,000 per year plus 2% commission on the sales price for all sales he makes, plus another 5% of the profit on each of those sales. For contract employees, the beginning date and end date of their contract are stored along with the billing rate for their hours. (10 points)

Problem 2. Some Tiny College staff employees are information technology (IT) personnel. Some IT personnel provide technology support for academic programs. Some IT personnel provide technology infrastructure support. Some IT personnel provide technology support for academic programs and technology infrastructure support. IT personnel are not professors. IT personnel are required to take periodic training to retain their technical expertise. Tiny College tracks all IT personnel training by date, type, and results (completed vs. not completed). Given that information, create the complete ERD containing all primary keys, foreign keys, and main attributes. (10 points)

Problem 3. The STUDENT table structure is shown in Table 1:

ATTRIBUTE NAME	SAMPLE VALUE	SAMPLE VALUE	SAMPLE VALUE	SAMPLE VALUE	SAMPLE VALUE
STU_NUM	211343	200128	199876	199876	223456
STU_LNAME	Stephanos	Smith	Jones	Ortiz	McKulski
STU_MAJOR	Accounting	Accounting	Marketing	Marketing	Statistics
DEPT_CODE	ACCT	ACCT	MKTG	MKTG	MATH
DEPT_NAME	Accounting	Accounting	Marketing	Marketing	Mathematics
DEPT_PHONE	4356	4356	4378	4378	3420
COLLEGE_NAME	Business Admin	Business Admin	Business Admin	Business Admin	Arts & Sciences
ADVISOR_LNAME	Grastrand	Grastrand	Gentry	Tillery	Chen
ADVISOR_OFFICE	T201	T201	T228	T356	J331
ADVISOR_BLDG	Torre Building	Torre Building	Torre Building	Torre Building	Jones Building
ADVISOR_PHONE	2115	2115	2123	2159	3209
STU_GPA	3.87	2.78	2.31	3.45	3.58
STU_HOURS	75	45	117	113	87
STU_CLASS	Junior	Sophomore	Senior	Senior	Junior

Table 1 - Problem 3

Do the following:

- Write the relational schema and draw its dependency diagram. Identify all dependencies, including all transitive dependencies. (4 points)
- Write the relational schema and draw the dependency diagram to meet the 3NF requirements to the greatest practical extent possible. If you believe that practical considerations dictate using a 2NF structure, explain why your decision to retain 2NF is appropriate. If necessary, add or modify attributes to create appropriate determinants and to adhere to the naming conventions. (4 points)
- Using the results, draw the Crow's Foot ERD. (2 points)

Problem 4. To keep track of office furniture, computers, printers, and other office equipment, the FOUNDIT Company uses the table structure shown in Table 2:

ATTRIBUTE NAME	SAMPLE VALUE	SAMPLE VALUE	SAMPLE VALUE
ITEM_ID	231134-678	342245-225	254668-449
ITEM_LABEL	HP DeskJet 895Cse	HP Toner	DT Scanner
ROOM_NUMBER	325	325	123
BLDG_CODE	NTC	NTC	CSF
BLDG_NAME	Nottooclear	Nottooclear	Canseefar
BLDG_MANAGER	I. B. Rightonit	I. B. Rightonit	May B. Next

Table 2 – Problem 4

Do the following,

- Given that information, write the relational schema and draw the dependency diagram. Make sure that you label the transitive and/or partial dependencies. (4 points)
- Write the relational schema and create a set of dependency diagrams that meet 3NF requirements. Rename attributes to meet the naming conventions, and create new entities and attributes as necessary. (4 points)
- Draw the Crow's Foot ERD. (2 points)

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