# horizontal lineDatabase R&D Exercise

Assignment 1

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.

|  |  |
| --- | --- |
| Name: | Pang, Jinhao |
| Date: | 2022.10.20 |
| NYU ID: | N19475049 |
| Course Section Number: | csci-ga.2433-001 |



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

**Professor’s Comments:**

|  |
| --- |
|  |

**9.2.** **Map the UNIVERSITY database schema shown in Figure 3.20 into a relational database schema.**

**COLLEGE**

|  |  |  |  |
| --- | --- | --- | --- |
| Cname | COffice | CPhone | IId |

**DEPT**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| DName | DCode | DOffice | DPhone | CStartDate | IIdn | CCod | CCName |

**COURSE**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| CCode | Credits | CoName | Level | CDesc | SecN |

**INSTRUCTOR**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Id | Rank | IName | IOffice | IPhone | DCo | SecNo |

**SECTION**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SecId | SecNo | Sem | Year | Bldg | RoomNo | DaysTime | CCcode | IIdd |

**STUDENT**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sid | DOB | FName | MName | LName | Addr | Phone | Major | Grade | DPNam |

**Takes**

|  |  |  |
| --- | --- | --- |
| Ssid | SeccId | Grade |

**Diagram

Description automatically generated**

**9.3. Try to map the relational schema in Figure 6.14 into an ER schema. This is part of a process known as reverse engineering, where a conceptual schema is created for an existing implemented database. State any assumptions you make.**

**Diagram, whiteboard

Description automatically generated**

Assume each book can be written by several authors and each author can write several books.

Assume each book\_copies can be copied by exactly that book and each book can be copied several times. Others shown on the images.

**9.6. Map the EER diagrams in Figures 4.9 and 4.12 into relational schemas. Justify your choice of mapping options.**

**PERSON**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ssn | Bdate | Sex | Fname | Minit | Lname | No | Street | Apt\_no | City | State | Zip |

**FACULTY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ssn | Salary | Fphone | Foffice | Rank |

**STUDENT**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ssn | Class | Grad\_flag | F\_ssn | DPname | Current\_sec | Grade | Sec\_N |

**COMMITTEE**

|  |  |
| --- | --- |
| SSn\_F | Ssn\_Gr |

**INSTRUCTOR\_RESEARCHER**

|  |  |  |  |
| --- | --- | --- | --- |
| Ssn | Faculty\_flag | Gran\_no | Sec\_no |

**DEPARTMENT**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Dname | Dphone | Office | SSn\_F | Coll\_name |

**GRANT**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Title | No | Agency | St\_date | SsnF |

**SUPPORT**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| GNo | NOI | Start | Time | End |

**SECTION**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sec# | Year | Otr | Ssn\_IN | CS\_no |

**COURSE**

|  |  |  |  |
| --- | --- | --- | --- |
| C# | Cname | Cdesc | Dep\_name |

**COLLEGE**

|  |  |  |
| --- | --- | --- |
| Cname | Dean | Coffice |

**DEGREE**

|  |  |  |  |
| --- | --- | --- | --- |
| SSn | College | Year | Degree |

**Table

Description automatically generated with low confidence**

**9.7. Is it possible to successfully map a binary M: N relationship type without requiring a new relation? Why or why not?**

It is not possible. Because some of the items in one side will be lost. For example, if the mapping is like:

**Diagram

Description automatically generated**

If not create a new relationship type, a4 and b4 will be ignored in the table, which will lose information. If use a new relationship type, it will be solved by two foreign keys.

**9.8. Consider the EER diagram in Figure 9.9 for a car dealer.**

**Map the EER schema into a set of relations. For the VEHICLE to CAR/TRUCK/SUV generalization, consider the four options presented in Section 9.2.1 and show the relational schema design under each of those options.**

**VEHICLE**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Vin | Price | Model | Engine\_size | Tonnage | No\_seats | CAR\_flag | Truck\_flag | SUV\_Flag | S\_sd | Csn |

**SALESPERSON**

|  |  |
| --- | --- |
| Sid | Name |

**SALE**

|  |  |  |  |
| --- | --- | --- | --- |
| SP\_id | Cssn | V\_vin | Date |

**CUSTOMER**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ssn | Name | State | Street | City |

**A picture containing diagram

Description automatically generated**

**9.9. Using the attributes you provided for the EER diagram in Exercise 4.27, map the complete schema into a set of relations. Choose an appropriate option out of 8A thru 8D from Section 9.2.1 in doing the mapping of generaliza- tions and defend your choice.**

**COMPUTER**

|  |  |  |  |
| --- | --- | --- | --- |
| Id | Computer\_attributes | Operating\_system | Software\_flag |

**LAPTOP**

|  |  |  |
| --- | --- | --- |
| L\_id | Computer\_attributes | L\_ attributes |

**DESKTOP**

|  |  |  |  |
| --- | --- | --- | --- |
| D\_ID | Computer\_attributes | D\_attributes | Acc\_id |

**COMPONENT**

|  |  |
| --- | --- |
| Comp\_ID | COMPONENT\_attributes |

**MEMORY**

|  |  |  |  |
| --- | --- | --- | --- |
| Me\_id | COMPONENT\_attributes | Me\_attributes | Lap\_id |

**SOUND\_CARD**

|  |  |  |
| --- | --- | --- |
| Sound\_id | COMPONENT\_attributes | Sound\_attributes |

**VIDEO\_CARD**

|  |  |  |
| --- | --- | --- |
| VI\_id | COMPONENT\_attributes | Vi\_attributes |

**ACCESSORY**

|  |  |  |  |
| --- | --- | --- | --- |
| Ac\_id | Key\_flag | Mouse\_flag | Monitor\_flag |