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Prof. Karimi

CIS 310-01 Database Design

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Test 1

Table P6.10

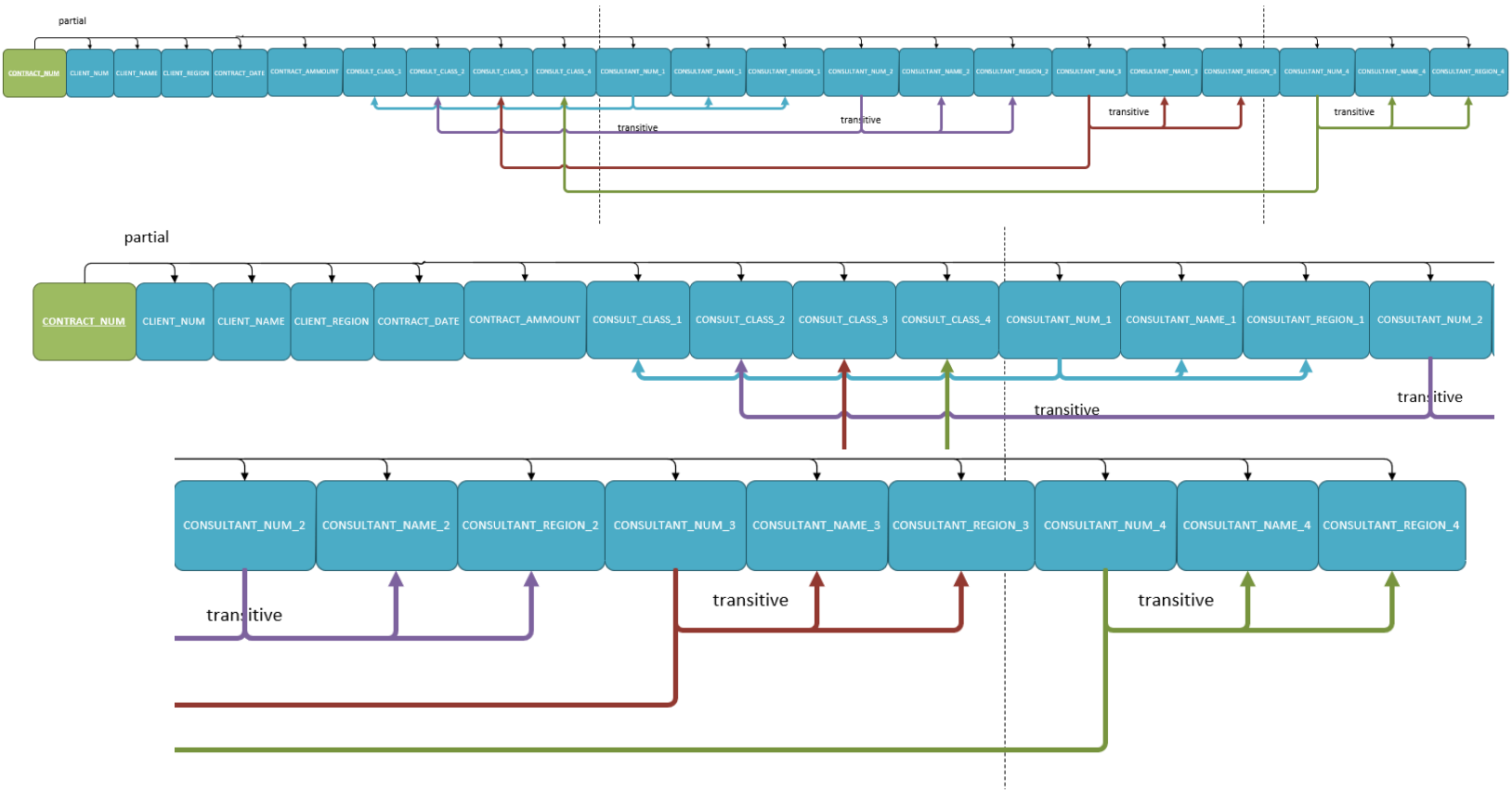
| ATTRIBUTE NAME | SAMPLE VALUE | SAMPLE VALUE | SAMPLE VALUE |
|---|---|---|---|
| CLIENT_NUM | 298 | 289 | 289 |
| CLIENT_NAME | Marianne R. Brown | James D. Smith | James D. Smith |
| CLIENT_REGION | Midwest | Southeast | Southeast |
| CONTRACT_DATE | 10-Feb-2018 | 15-Feb-2018 | 12-Mar-2018 |
| CONTRACT_NUMBER | 5841 | 5842 | 5843 |
| CONTRACT_AMOUNT | $2,985,000.00 | $670,300.00 | $1,250,000.00 |
| CONSULT_CLASS_1 | Database Administration | Internet Services | Database Design |
| CONSULT_CLASS_2 | Web Applications | | Database Administration |
| CONSULT_CLASS_3 | | | Network Installation |
| CONSULT_CLASS_4 | | | |
| CONSULTANT_NUM_1 | 29 | 34 | 25 |
| CONSULTANT_NAME_1 | Rachel G. Carson | Gerald K. Ricardo | Angela M. Jamison |
| CONSULTANT_REGION_1 | Midwest | Southeast | Southeast |
| CONSULTANT_NUM_2 | 56 | 38 | 34 |
| CONSULTANT_NAME_2 | Karl M. Spenser | Anne T. Dimarco | Gerald K. Ricardo |
| CONSULTANT_REGION_2 | Midwest | Southeast | Southeast |
| CONSULTANT_NUM_3 | 22 | 45 | |
| CONSULTANT_NAME_3 | Julian H. Donatello | Geraldo J. Rivera | |
| CONSULTANT_REGION_3 | Midwest | Southeast | |
| CONSULTANT_NUM_4 | | 18 | |
| CONSULTANT_NAME_4 | | Donald Chen | |
| CONSULTANT_REGION_4 | | West | |

Problem 10.
The manager of a consulting firm has asked you to evaluate a database that contains the table structure shown in Table P6.10.

Table P6.10 was created to enable the manager to match clients with consultants. The objective is to match a client within a given region with a consultant in that region and to make sure that the client's need for specific consulting services is properly matched to the consultant's expertise. For example, if the client needs help with database design and is located in the Southeast, the objective is to make a match with a consultant who is located in the Southeast and whose expertise is in database design. (Although the consulting company manager tries to match consultant and client locations to minimize travel expense, it is not always possible to do so.) The following basic business rules are maintained:

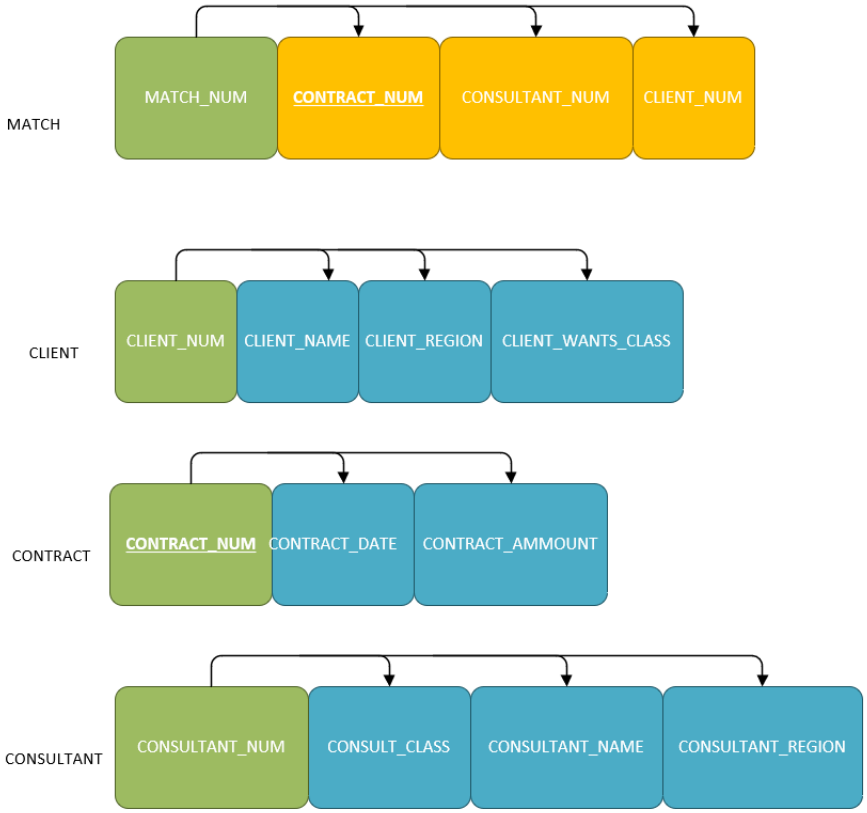
- Each client is located in one region.
- A region can contain many clients.
- Each consultant can work on many contracts.
- Each contract might require the services of many consultants.
- A client can sign more than one contract, but each contract is signed by only one client.
- Each contract might cover multiple consulting classifications. For example, a contract may list consulting services in database design and networking.
- Each consultant is located in one region.
- A region can contain many consultants.
- Each consultant has one or more areas of expertise (class). For example, a consultant might be classified as an expert in both database design and networking.
- Each area of expertise (class) can have many consultants. For example, the consulting company might employ many consultants who are networking experts.

1. Given this brief description of the requirements and the business rules, write the relational schema and draw the dependency diagram for the preceding (and very poor) table structure. Label all transitive and/or partial dependencies.




Relational Schema: **<u>CONTRACT_NUM,</u>** CLIENT_NUM, CLIENT_NAME, CLIENT_ REGION, CONTRACT_DATE, CONTRACT_AMMOUNT, CONSULT_CLASS_1, CONSULT_CLASS_2, CONSULT_CLASS_3 , CONSULT_CLASS_4, CONSULTANT_NUM_1 , CONSULTANT_NAME_1, CONSULTANT_REGION_1 , CONSULTANT_NUM_2 , CONSULTANT_NAME_2, CONSULTANT_REGION_2 , CONSULTANT_NUM_3 , CONSULTANT_NAME_3, CONSULTANT_REGION_3 , CONSULTANT_NUM_4 , CONSULTANT_NAME_4, CONSULTANT_REGION_4

2. Break up the dependency diagram you drew in Problem 10a to produce dependency diagrams that are in 3NF and write the relational schema. (*Hint:* You might have to create a few new attributes. Also make sure that the new dependency diagrams contain attributes that meet proper design criteria; that is, make sure there are no multivalued attributes, that the naming conventions are met, and so on.)




3. Using the results of Problem 10b, draw the Crow's Foot ERD.