Databases and information systems laboratory CS313

IIT Dharwad

Handout 3
$23 - 08 - 2023$

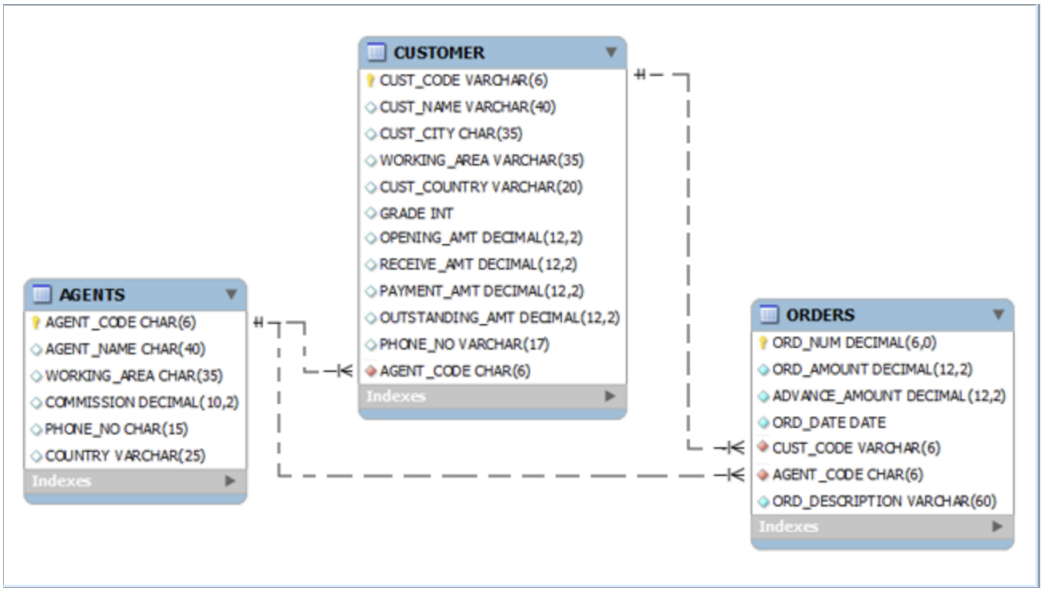
Consider a College database with the following schema which we used in one of the previous class (the primary keys are denoted by bold font):

- `student (`**`sid`**`, sname, gender, gpa)`
  (Here `sid` refers to student id and `sname` refers to student name)
- `department (`**`dname`**`, numphds)`
  (Here `dname` refers to department name and `numphds` refer to the number of Phd students enrolled in the department)
- `professor (`**`pname`**`, dname)`
  (Here `pname` refers to professor name and `dname` is a Foreign Key that refers to `dname` in `department` table)
- `course (`**`cno, cname, dname`**`)`
  (Here `cno` refers to course number, `cname` refers to course name and `dname` is a Foreign Key that refers to `dname` in `department` table. Note that in this table `cno, dname` together form the primary key)
- `major (`**`dname, sid`**`)`
  (Here `dname` is a Foreign Key that refers to `dname` in `department` table and `sid` is a Foreign Key that refers to `id` in `student` table)
- `enroll (`**`sid`**`, grade, `**`dname, cno`**`)`
  (Here `sid` is a Foreign Key that refers to `id` in `student` table, `dname, cno` are Foreign Keys that refer to `dname, cno` in `course` table)

Write queries for the following

1. Find the names of professors who work in departments that have fewer than 50 PhD students.
2. Find the name(s) of the student(s) with the highest GPA.
3. For each Computer Sciences course, find the course number and the average gpa of the students enrolled in the class.
4. Find the name(s) and sid(s) of the student(s) enrolled in the maximum number of courses.
5. Find the name(s) of department(s) that have maximum number of professors.
6. Find the name(s) and major(s) of students who are taking the Thermodynamics course.
7. Find the names of the departments such that every student who is majoring in that department does not take the Compiler Construction course.
8. Find the names of students who are taking at least one Civil Engineering course and at most two Mathematics course.
9. A department is called 'under performing' if there are one or more students who are majoring in that department and have GPA < 1.5. Find the names of all under performing departments and the average GPA of the students who are majoring in that department.
10. Find the ids, names and GPAs of the students who are currently taking all the Civil Engineering courses.

Consider the following Schema for Sales Database:



1. Create a new database called `salesdb`.
2. Use the file `tableSales.sql` to create tables for the described relational schema.
3. Use the file `dataSales.sql` and populate the tables.
4. Retrieve the Names of all the Customers who have Grade 2.
5. Retrieve the Order number, date and descriptions of all orders in Ascending order of their dates.
6. Retrieve the Order number, date and amount of all orders with amount ≥ 800 in Descending order of their amount.
7. Retrieve all details of Customers in the alphabetical order of Working Area . Among the Customers with same working area, display the details in descending alphabetical order of Customer names.
8. Retrieve the names of all Customers that start from "S"
9. Retrieve the Order number of all orders in March 2008.
10. What would be the Order Amount if the Amount was 10% more that its current value (for all orders)?

11. Retrieve the Order number and Balance amount (Order amount - Order Advance) for all orders where the order amount is between 2000 to 4000.

12. Retrieve the Order Number, Customer code and order amount where the amount matches the order amount of some order by the Customer with ID 'C00022'.

13. Select the names and code of the Agents whose commission is greater than all the agents working in Bangalore.

14. Select the names of Agents whose commission is greater that at least one of the agent working in Bangalore.

15. Retrieve the Agent code of all agents who have completed at least one order.

16. Retrieve the Names of all the customers who have never made any order.

17. Retrieve the codes of all Agents who are are involved in Orders that have Amount ≥ 800

18. For the previous case, retrieve only the distinct agent names.

19. Retrieve the Names and Ids of all customers who are in Paris, New York or Bangalore.

20. Retrieve the Names of Agents who have completed an order of amount 1000.

21. List the Total Order Amount, Average Order Amount, Min Order Amount and Max Order Amount (Try what happens to these functions when one or all relevant values are `NULL`)

22. List the number of Customers in New York.

23. Count the number of Distinct Order Amounts.

24. Retrieve Agent Name and Agent Ids of all agents who have completed two or more orders.

25. Retrieve how many agents are present at every working area.

26. List all the names of Agents at every busy location (A location is busy if there are at least 2 orders).

27. Retrieve the average order amount for all agents.

28. Delete all the agents from Bangalore

29. Add a new column to Customer table called Address[`VARCHAR(50)`] and set it to `NULL` by default. After this, add some address to the customer with code 'C0013'.

30. Delete the Country column in Agents table

31. Delete all entries from Orders table

32. Delete the table Customers