

# IT3031 - Database Systems and Data Driven Applications

BSc (Hons) in IT Data Science

Faculty of Computing

Sri Lanka Institute of Information Technology

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## Tutorial 1 – Object Relational Model

Consider the following object relational database schema:

Object types:

Emp\_t (eno: number(4), ename: varchar2(15), edept: ref dept\_t, salary: number(8,2))

Dept\_t (dno: number(2), dname: varchar2(12), mgr ref emp\_t)

Proj\_t (pno: number(4), pname: varchar2(15), pdept ref dept\_t, budget: number(10,2))

Tables:

Emp of Emp\_t (eno primary key, edept references dept)

Dept of Dept\_t (dno primary key, mgr references emp)

Proj of Proj\_t (pno primary key, pdept references dept)

The Emp, Dept, and Proj tables contain tuples for all employees, departments and projects respectively. The attributes of Emp are employee number (eno), name (ename), employee's department (edept) and salary. Attributes of Dept are department number (dno), department name (dname), manager (mgr). Attributes of Proj are project number (pno), project name (pname), department in charge (pdept) and budget.

Write Oracle OBJECT SQL statements to answer the following queries (use columns of REF type instead of joins to link tables)

- (a) Find the name and salary of managers of all departments. Display the department number, manager name and salary.
- (b) For projects that have budgets over \$50000, get the project name, and the name of the manager of the department in charge of the project.
- (c) For departments that are in charge of projects, find the department number, department name and total budget of all its projects together.
- (d) Find the manager's name who is controlling the project with the largest budget
- (e.) Find the managers who control budget above \$60,000. (Hint: The total amount a manager control is the sum of budgets of all projects belonging to the dept(s) for which the he/she is managing). Print the manager's employee number and the total controlling budget.
- (f.) Find the manager who controls the largest amount. Print the manager's employee number and the total controlling budget.