

4COSC003W.Y Computer Science Practice

Module leader	Maria Chondrogianni
Unit	Coursework 2
Weighting:	60%
Qualifying mark	30%
Description	Data storage and manipulation
Learning Outcomes Covered in this Assignment:	LO3, LO4, LO5, LO6
Handed Out:	5 Feb 2020
Due Date and Time:	5th May 2020, 13:00
Expected deliverables	A single document detailing design, implementation and testing of a database
Method of Submission:	online via Blackboard
Type of Feedback and Due Date:	Generic and written feedback to all students three weeks after submission. All marks will remain provisional until formally agreed by an Assessment Board.

Assessment regulations

Refer to section 4 of the *How you study* guide for undergraduate students for a clarification of how you are assessed, penalties and late submissions, what constitutes plagiarism etc.

Penalty for Late Submission

If you submit your coursework late but within 24 hours or one working day of the specified deadline, 10 marks will be deducted from the final mark, as a penalty for late submission, except for work which obtains a mark in the range 40-49%, in which case the mark will be capped at the pass mark (40%). If you submit your coursework more than 24 hours or more than one working day after the specified deadline you will be given a mark of zero for the work in question unless a claim of Mitigating Circumstances has been submitted and accepted as valid.

It is recognised that on occasion, illness or a personal crisis can mean that you fail to submit a piece of work on time. In such cases you must inform the Campus Office in writing on a mitigating circumstances form, giving the reason for your late or non-submission. You must provide relevant documentary evidence with the form. This information will be reported to the relevant Assessment Board that will decide whether the mark of zero shall stand. For more detailed information, please refer to the [University Assessment Regulations](#).

Task details:

You are required to produce an ERD (Entity Relationship Diagram) for the case study given below using UML notation, any other notation will not be graded.

The ERD should represent customer order processing only.

For each of the entities in your model, you should clearly identify appropriate attributes and relevant keys.

Relationships between entities should be clearly identified and labelled with any assumptions fully documented.

You are also required to implement your design as a relational database using MySQL database by creating appropriate SQL scripts and executing them.

You should populate your tables with sufficient data to demonstrate execution of four relevant and useful queries.

Submission details:

You must submit a single pdf document with the following elements:

- 1. ER diagram for customer order processing system – a sample diagram is given at the end of case study. You are advised to use the entity table shown after the sample ERM to ensure that for each and every entity, a primary key is identified and a foreign key where necessary.***
- 2. SQL table creation scripts.***
- 3. SQL scripts showing the sample data you have inserted into your database - a sample script file is shown on the last page.***

- 4. Four SQL query scripts that demonstrate some useful functionality of the system, with an explanation of their rationale/use. The SQL should be provided, together with a screen print of the output it produces. Use the table on the last page to document your queries.*

Coursework Case study

BodyCare Ltd (BCL) specialises in supplying quality Beauty & Fragrance boxed gift sets for men and women in the UK. Its reputation for using only the best products has resulted in rapid expansion in sales over the last three years.

Skin care sets, make-up sets, fragrance sets, hair care sets, etc. are sourced from a number of suppliers who deliver goods to BCL's warehouse in Uxbridge where the sets are assembled to order by a staff of 10. A standard range of around 50 sets is offered, but every so often a new set is produced for a special occasion. The marketing department is always on the lookout for new ideas and business opportunities. The company also has a policy of donating 2% of its annual total sales value to local charities.

Each product making up a set is supplied by a single supplier and is given a unique product number and description by BCL. Products are always sold as part of a set, never on their own. A minimum stock level is recorded for each product and as soon as the stock falls below this, a purchase order is raised to replenish stock.

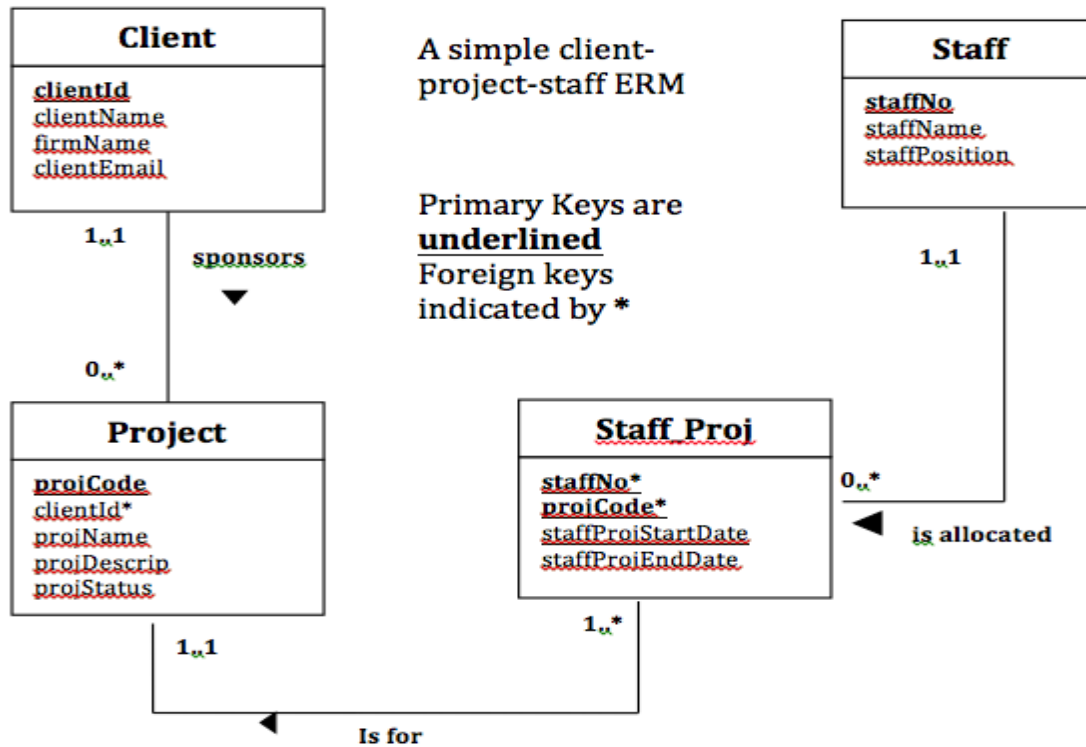
The sets are sold via a team of salesmen who are paid a nominal salary with the opportunity to increase their earnings from commissions on sales. Commission is paid at 10% of the value of a set, but then goes up to 20% after a salesman's annual sales target is reached.

The full list of sets offered is contained in the company's catalogue. Prices range from the 'Deluxe Re-creation' priced at £650 to the more affordable 'Regular Care' set priced at £25.99. Each set has an imaginative description to entice customers to part with their money. The bulk of BCL customers are corporate clients who buy the gift sets as presents for their employees and clients. There is also good demand from young professionals who just fancy splashing out from time to time. The business is enjoying rapid growth and the current system of recording everything on Excel Spreadsheets is proving time consuming and leading to errors.

The owners are thinking of setting up an integrated sales order processing system but **would like to do it in stages**. The first stage will be a **Customer Order Processing** system as a '**proof of concept**'. This will enable the company to keep a record of customer details and sales for promotional purposes as well as to identify 'high spenders'.

If that proves successful then the supplier side too will be added later on. Payments are handled through **PayPal** due to security and fraud concerns and no changes are planned here.

Sample ERM:



Entity	Primary Key (PK)	Foreign Key (FK)	Rationale for PK
Client	clientId	N/A	Client name as alternative possibility but may not scale up and clientId would be unique
Staff	staffNO	N/A	StaffNO is unique to each staff
Project	projCode	N/A	projCode aunique identifier for each project
Staff_Proj	staffNO, projCode	staffNO, projCode	Staff_Proj is a link entity and a minimum PK is a composite key made up of parent PKs as well as being FKs.

Sample SQL script file:

DROP TABLE dept;

```
CREATE TABLE dept
(DEPTNO INT(2),
 DNAME VARCHAR(14),
 LOC VARCHAR(13),
 CONSTRAINT pk_dept_deptno PRIMARY KEY (DEPTNO)
);
```

Insert into dept (DEPTNO,DNAME,LOC) values (10,'ACCOUNTING','NEW YORK');

Insert into dept (DEPTNO,DNAME,LOC) values (20,'RESEARCH','DALLAS');

Insert into dept (DEPTNO,DNAME,LOC) values (30,'SALES','CHICAGO');

Insert into dept (DEPTNO,DNAME,LOC) values (40,'OPERATIONS','BOSTON');

DROP TABLE emp;

```
CREATE TABLE emp
(EMPNO INT(4),
 ENAME VARCHAR(10),
 JOB VARCHAR(9),
 MGR INT(4),
 HIREDATE DATE,
 SAL FLOAT(7,2),
 COMM FLOAT(7,2),
 DEPTNO INT(2),
 CONSTRAINT pk_emp_empno PRIMARY KEY (EMPNO),
 CONSTRAINT fk_emp_deptno FOREIGN KEY (DEPTNO) REFERENCES dept (DEPTNO)
);
```

Insert into emp (EMPNO,ENAME,JOB,MGR,HIREDATE,SAL,COMM,DEPTNO) values

(7369,'SMITH','CLERK',7902,STR_TO_DATE('17-12-80','%d-%m-%Y'),800,null,20);

Insert into emp (EMPNO,ENAME,JOB,MGR,HIREDATE,SAL,COMM,DEPTNO) values

(7499,'ALLEN','SALESMAN',7698,STR_TO_DATE('20-02-81','%d-%m-%Y'),1600,300,30);

Insert into emp (EMPNO,ENAME,JOB,MGR,HIREDATE,SAL,COMM,DEPTNO) values

(7521,'WARD','SALESMAN',7698,STR_TO_DATE('22-02-81','%d-%m-%Y'),1250,500,30);

Query No	Purpose	Tables involved	SQL	Correct Execution
1	Show how many projects each member of staff is working on	1 table – Staff_proj	Select count(*) ----- -	Yes/No
2	To reward long term staff –who have been with the company over 10 years	1 table - Staff	Date operations – current date (System Date), Date Staff joined, etc, ordered by	Yes/No
3	Staff who have worked on projects sponsored by a specific client	All 4 tables	3 joins, etc	Yes/No
4				