Introduction

This assignment requires you to demonstrate knowledge and skills you have acquired throughout this module by producing a database and a report that addresses the tasks given below. In order to complete the assignment, you will need to choose an appropriate organization to research and base your project on it.

Choosing an appropriate organization

Step 1: **select an industry in which you are interested.**

For example, commercial airlines, commercial banking, retail, beauty, IT, publishing, hospitality, leisure and tourism, automotive, construction etc.

Step 2: **select one or more organizations in that industry to research.**

You should investigate the sort of data they hold and the types of transactions they carry out.

For example, the education college shown in the appendix holds data about the courses, staff, modules, laboratories and equipment. Their transactions might include allocating modules to courses, staff to modules, equipment to laboratories and assigning laboratories to courses.

Step 3: You should investigate the requirements that your organization has in the development of a new software system. This could be particular problems they are trying to solve, processes they want to be more efficient or new approaches they want to implement to improve their business.

For example, an education college might want to make enrolment of students onto courses easier than it is currently done. Do not choose a college for your organization as this has been used as an example.

You should reference the businesses or organizations that you investigate.

Step 4. **Gathering materials**

For your chosen type of organization gather materials relating to their data and transactions. You could do this by looking online, through personal contacts with someone who works in the industry or simply by using a particular business's services.

Materials that you gather might include:

- Invoices
- Receipts
- Order Forms
- Customer Records
- Delivery Notes
- Complaints Forms
- Booking Forms
- Descriptions of daily tasks

• Interviews with staff members

• Company reports

Task 1 – Business Overview and Requirements (5 marks)

You should include an outline of the context in which the organization operates.

For example, a college would operate in an environment in competition with other colleges. You should outline their day-to-day operations, their data requirements and the types of transactions they carry out. You might include scans and/or diagrams of any documents you have gathered, which should be suitably anonymized so as not to show any personal data that might be included. You should explain the purpose of these documents in the context of the organization.

You should outline the scope of the software project that you will undertake. This should be suitably ambitious enough to include at least 10 entities in the model. You should make clear what will be included within the scope of the project and what will not be included. This discussion of scope should include both data and operational issues.

You should clearly outline or list the requirements of the organization with regard to the database that is being developed.

Task 2 – Use case diagram (10 marks)

Produce a use case diagram for your organization and an accompanying use case description.

You should use the UML format.

Task 3 –Class Diagram (10)

Draw a Class Diagram to represent the system structure. The Class Diagram should be drawn with a suitable CASE tool and show attributes, operations, scope and relationship of classes to each other with multiplicity. The use of abstract classes and sub-classes (where appropriate) will attract additional marks.

Provide a justification why each class was selected for inclusion, and how its relationship to other classes was derived.

Task 4 – Activity diagram (5)

Draw an activity diagram to show the classes involved when a user wants to create a new account.

Show which function each class is associated with.

Scenario (Sample)

Lowry College is Further Education College based in Kent, United Kingdom. They specialize in science education.

They want a database to help them manage teaching and resources for their various courses. This database will not be concerned, at least initially, with the allocation of students to courses.

Each course will have a number of staff allocated to it. A member of staff might be allocated to more than one course. Staff are defined by type: Teacher, Technical Support, Administration, Other.

Courses are made up of modules. A module might be part of more than one course. Modules are defined by type: ‘Core’, ’Elective’ or ‘Optional’. Some modules such as ‘Biochemistry of Life’ are taught on different courses.

A course might have one or more laboratories associated with it. A laboratory is administered by one particular course.

A module will be taught in a particular laboratory. A laboratory might host many different modules. Laboratories have equipment in them. A piece of equipment might be allocated to more than one laboratory. Equipment is defined by type.

Examples of data are shown in the tables below.

Document 1. Staff Allocated to Courses

Course ID	Course Name	Staff ID	Staff Name	Staff Type
CHEM	BTEC Level 3 Chemistry	S2399	Barry Harvey	Teacher
BIO	BTEC Level 3 Biology	S2399	Barry Harvey	Teacher
CHEM	BTEC Level 3 Chemistry	S2400	Dorinda Harvey	Teacher
BIO	BTEC Level 3 Biology	S2300	Arabella Johnson	Teacher
CHEM	BTEC Level 3 Chemistry	S2301	Mavis Kingdom	Other
BIO	BTEC Level 3 Biology	S2301	Mavis Kingdom	Other
ENG	Certificate in Engineering	S2301	Mavis Kingdom	Other
CHEM	BTEC Level 3 Chemistry	S1101	Alison Walters	Technical Support
BIO	BTEC Level 3 Biology	S1101	Alison Walters	Technical Support
ENG	Certificate in Engineering	S1101	Alison Walters	Technical Support
ENG	Certificate in Engineering	S1102	Dennis Brown	Teacher
CHEM	BTEC Level 3 Chemistry	S2111	Abidh Khan	Teacher
BIO	BTEC Level 3 Biology	S2111	Abidh Khan	Teacher
BIO	BTEC Level 3 Biology	S8321	Kristian Cobaj	Administration
ENG	Certificate in Engineering	S8321	Kristian Cobaj	Administration
CHEM	BTEC Level 3 Chemistry	S9088	Julius Env	Administration

Document 2. Modules on Courses

Course Code	Module Code	Module Name	Taught by	Module Type
BIO	BC	Biochemistry of Life	Barry Harvey	Core
CHEM	BC	Biochemistry of Life	Barry Harvey	Core
CHEM	EP	Experimental Practice	Dorinda Harvey	Elective
ENG	CAD	Computer Aided Design	Dennis Brown	Elective
BIO	PB	Plant Biology	Arabella Johnson	Optional
CHEM	ME1	Metals 1	Dorinda Harvey	Optional
CHEM	ME2	Metals 2	Abidh Khan	Optional
CHEM	NEU	Neurochemistry	Abidh Khan	Optional
BIO	NEU	Neurochemistry	Barry Harvey	Optional
CHEM	IO	Inorganic Chemistry	Abidh Khan	Core
BIO	EP	Experimental Practice	Dorinda Harvey	Elective

Document 3. Courses, laboratories and equipment

Course Code	Laboratory ID	Laboratory Name	Equipment ID	Equipment Name	Quantity	Equipment Type
CHEM	CHEM1	Chemistry One	SG	Safety goggles	21	Safety
CHEM	CHEM1	Chemistry One	BS	Beakers	50	Chemistry Experiment
CHEM	CHEM1	Chemistry One	CS	Conical flasks.	30	Chemistry Experiment
CHEM	CHEM1	Chemistry One	BF	Boiling flasks.	30	Chemistry Experiment
CHEM	CHEM1	Chemistry One	TT	Test tubes.	50	Chemistry Experiment
CHEM	CHEM2	Chemistry Two	SG	Safety goggles	21	Safety
CHEM	CHEM2	Chemistry Two	BS	Beakers	50	Chemistry Experiment
CHEM	CHEM2	Chemistry Two	CS	Conical flasks.	30	Chemistry Experiment
CHEM	CHEM2	Chemistry Two	BF	Boiling flasks.	30	Chemistry Experiment
CHEM	CHEM2	Chemistry Two	TT	Test tubes.	50	Chemistry Experiment
BIO	BIO1	Biology One	SG	Safety goggles	21	Safety
BIO	BIO1	Biology One	MI	Microscopes	10	Biology Experiment
BIO	BIO1	Biology One	PD	Petri dishes	20	Biology Experiment
BIO	BIO1	Biology One	DY	Dyes	23	Biology Experiment
BIO	BIO1	Biology One	FO	Forceps	5	Biology Experiment
BIO	BIO1	Biology One	BF	Boiling flasks	20	Chemistry Experiment
ENG	ENG1	Engineering One	MM	Multi-meter.	5	Engineering Experiment
ENG	ENG1	Engineering One	LCR	LCR Meter	5	Engineering Experiment
ENG	ENG1	Engineering One	OSC	Oscilloscope.	5	Engineering Experiment
ENG	ENG1	Engineering One	SI	Soldering Iron	24	Engineering Experiment
ENG	ENG1	Engineering One	PMT	Precision Mechanical Tools set	24	Engineering Experiment
ENG	ENG1	Engineering One	SG	Safety goggles	24	Safety