

BST-BCS-23A – Data Bases
Project Final Report & Files
[Guideline]

Project Final Report
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+ **Work Effectively in Teams Form** (only this form is an individual submission)

HOW TO PROCEED?

II. Database Initial Study and Analysis

Understanding the Information and Data Requirements: Data requirements are derived from the information needs of different system users (actors/roles), such as managers and decision-makers

*Example: “What **information** (queries/reports) should be generated for the managers or decision-makers of the system?”*

Use case scenario involves a basic description of business operations. Based on the provided use case, teams should *discover and understand the **information** and **data requirements*** of the *Alumni System* through several methods, such as...

- i. interviews,
- ii. direct observation of people,
- iii. procedure and document analysis,
- iv. web searches, etc.

In this use case scenario, it may not be feasible to completely design the database to accommodate all the required business operations. Teams can only partially fulfill the data needs for these operations. As a result, each team must decide which operations their design can support based on the data requirements.

Documenting Data Gathering Methods: Briefly describe your team's methods to gather data. This should include the specific methods used and a summary of the data collection process.

This part summarizes the method(s) used in the team's requirements collection. While designing the database and determining the data requirements, students use their ***findings on the information requirements of the system.***

Determining the Information Requirements of the System: Summarise the given use case covering *organisation* (objectives, actors/roles (users), business operations) and *system* (scope, user information requirements -information needed for various queries and reports for different users).

Teams may simplify the real-world data structures to eliminate the complexities.

III. Database Design: Conceptual Design

i. Initial Entity Relationship (and/or EER) Model

The Entity-Relationship model should contain at least seven entities and an appropriate number of relationships. The model only displays entities, relationships, and connectivities (one-to-many, one-to-one, and many-to-many). You can use one of the following notations: Chen, Crow's foot, or UML Class Diagrams. State your preference in the report. *Do not add cardinalities. (Do not add attributes to the Chen ERD. Attributes will be in the Logical Design part.*

ii. Business rules:

Describe the relationships as follows;

A VENDOR supplies one or many ITEMS.

An ITEM is supplied by only one VENDOR.

The business rules should be attached to the E-R Model as a separate page.

Do not add attributes to your ERD. They will be listed in the *Logical Design* part.

iii. Data Dictionary

Describe attributes in a tabular format. Use **the template** provided.

Example:

TABLE 3.6

A sample data dictionary

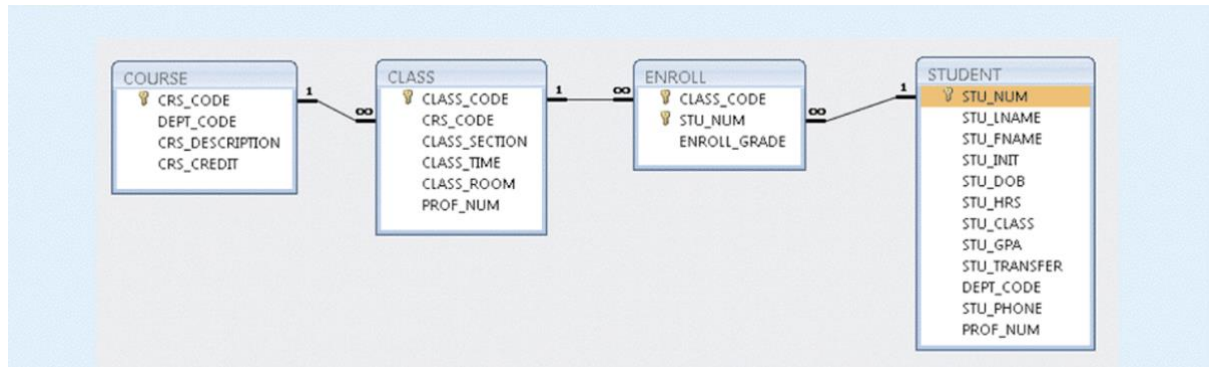
Table Name	Attribute Name	Contents	Type	Format	Domain	Required	PK or FK	FK Referenced Table
CUSTOMER	CUS_CODE	Customer account code	CHAR(5)	99999	10000-99999	Y	PK	AGENT
	CUS_LNAME	Customer last name	VARCHAR2(20)	Xxxxxxxx	100-999	Y	FK	
	CUS_FNAME	Customer first name	VARCHAR2(20)	Xxxxxxxx		Y		
	CUS_INITIAL	Customer initial	CHAR(1)	X				
	CUS_RENEW_DATE	Customer insurance renewal date	DATE	dd-mmm-yyyy				
	AGENT_CODE	Agent code	CHAR(3)	999				
AGENT	AGENT_CODE	Agent code	CHAR(3)	999	0.00-9999999.99	Y	PK	
	AGENT_AREACODE	Agent area code	CHAR(4)	999		Y		
	AGENT_PHONE	Agent telephone number	CHAR(14)	999-9999		Y		
	AGENT_LNAME	Agent last name	VARCHAR2(20)	Xxxxxxxx		Y		
	AGENT_YTD_SLS	Agent year-to-date sales	NUMBER(9,2)	9 999 999.99		Y		
FK	=	Foreign key						
PK	=	Primary key						
CHAR	=	Fixed character length data (1-255 characters)						
VARCHAR2	=	Variable character length data (1-4 000 characters)						
NUMBER	=	Numeric data (NUMBER(9,2) is used to specify numbers with two decimal places and up to nine digits, including the decimal places. Some RDBMSs permit the use of a MONEY or CURRENCY data type.)						

IV. Database Design: Logical Design

Generate a relational database design by EER-to-Relational Mapping. (The relational schema is created). It should include normalized tables that are in the 3rd Normal Form.

Make sure that you apply the *systematic algorithm of relational mapping and normalization*.

Example:



V. Physical Design/Implementation:

Implement the proposed design in *SQLiteStudio*, *MySQL*, *MS-Access*, *PostgreSQL*, etc. (select any RDBMS).

1. Organize data into tables,
2. Establish relationships and enforce referential integrity,
3. Enter sufficient data into tables so that the queries display meaningful information.

VI. Querying/Reporting:

1. Using SQL statements, create *at least ten queries*.
 - a. Save queries in the RDBMS,
 - b. Include the queries in the final report as described below.
 - i. SQL statements
For instance:
SELECT CUS_CODE, COUNT(INV_NUMBER) AS Total_no_of_Invoices
FROM INVOICE
GROUP BY CUS_CODE;

- ii. Images of the SQL statements along with their outputs.
For instance:

Query		History
1	SELECT CUS_CODE, COUNT(INV_NUMBER) AS Total_no_of_Invoices	
2	FROM INVOICE	
3	GROUP BY CUS_CODE;	

Grid view		Form view
<div> </div>		Total rows loaded: 5
CUS_CODE	Total_no_of_Invoices	
1 10011	3	
2 10012	1	
3 10014	2	
4 10015	1	
5 10018	1	

- iii. Query specifications
 Add query specifications by explaining the following briefly:
 - ⇒ The name of the query,
 - ⇒ Who will use the query (as an actor of the system),
 - ⇒ The purpose of the query, and

⇒ What each query displays.

Notes:

- Queries must include *advanced features* such as nested subqueries, various types of joins, GROUP BY statements, HAVING clauses, and aggregate functions, along with *summaries*.
 - Establish a clear connection between the user information requirements (2. ii) and the queries/reports (VI). When creating queries, utilize creativity to develop scenarios that fulfill information requirements.
2. Save the report as a document file.

+ Work Effectively in Teams Form (individual submission)

Utilize the provided template to assess your performance and that of your team members. Send the evaluation form *confidentially* to the lecturer via email. Do not include the evaluations in your final report.

***The final report and database submission are due on July 10, 2025, at 9:00 AM (CET).
Project presentations and the Question & Answer jury session will occur on July 10, 2025 (for Groups 1 and 3) and July 11, 2025 (for Group 2).***

Files to submit:

1. The final report as a *Word* document (group submission),
2. The database file (group submission),
3. “*Work Effectively in Teams Form*” (individual submission).

GOOD LUCK!

IMPORTANT: A written final exam will take place on July 14, 2025 (G1 & G3) and July 15, 2025 (G2).

ASSESSMENT DISTRIBUTION:

Project: 45%
Written Final Exam: 35%
Datacamp Assignment: 20%