Application Design and Development
Course Assessment Scheme - Semester A (2020-2021)

Course Assignment

1. Overview

In the individual assignment, you are required to carry out an application development project which would provide benefits to the target users. You have to go through various system development activities and producing the following deliverables:

- a **system specification** (2,000 words) with supporting documentation and evaluation of the approach taken that details the development of a practical and workable software application; and

- a **practical demonstration** (10-15 mins) of the final system. You are required to explain the overall system architecture of the system and demonstrate the actual operations of the system.

2. The Case – HK Property

HK Property is a real estate agency in specializing in selling and leasing property in Hong Kong. With reference to the following requirements, you have to design and develop a system for supporting the operations of the company.

Application Details

In the initial meetings with the management team of HK Property, you have identified some data objects and business rules.

(1) Data Objects

- **Property:** property ID, owner ID, district, estate name, block number, floor number, flat number, gross floor area (sq. feet), number of bedrooms, car park provided, selling price, rental price

- **Property Owner:** owner ID, owner name, owner phone number

- **Customer:** customer ID, customer name, customer phone number, preferred district, preferred estate, budget for buying, budget for rental

- **Agent:** agent ID, agent name, agent phone number, branch ID

- **Branch:** branch ID, address, branch manager

- **Transaction:** transaction ref, transaction type (for sale or for rental), transaction date, property ID, sold price, rental price, owner ID, customer ID, agent ID, commission

(2) Business Rules

- Each property is offered by an owner, while each owner could offer one or more properties.
- Each transaction is made for one property, while each property may be related to more than one transaction.
- Each transaction is completed by one customer, while each customer may be related to more than one transaction.
- For property selling, commission equals to 2% of the sold price.
- For property rental, commission equals to 1 month rental price.
- Each agent is stationed in a branch, while each branch manages many agents.

(3) User Queries

The management team of HK Property also listed out a number of user queries:

- Given an estate name, list the information of properties in the estate for sale.
- Given an estate name, list the information of the properties in that estate for rent.
- Based on the customer's preferences and budget for buying, list the recommended properties for sale.
- Based on the customer's preferences and budget for rental, list the recommended properties for rent.
- Given a property, list the information of the property owner.
- Given a branch, generate a report of the transactions (classified by transaction types) completed by the agents of that branch.

Note: You may modify the data objects or include additional data objects if needed. Please specify the reasons or assumptions for the modifications.

3. Deliverables

System Specification

Produce a system specification with supporting documentation and evaluation of the approach taken (2,000 words) that details the development of a practical and workable software application. The system specification should include the following items:

- System overview
- Design specification
- Database development
- Implementation tools
- Evaluation of the approach taken

The system specification should be submitted in form of a soft copy through Turnitin to the Canvas system. The file name of the system specification should be in this format:

<Tutorial Group> - <Student Name> - SystemSpec.docx

For example, ***G4 - Chan Tai Man - SystemSpec.docx***

Practical Demonstration

A practical demonstration (10-15 mins) of the final system. This is used to show that the ideas specified in the system specification are actually implemented in the final system. The requirements of the demonstration are as follows:

- Explain the overall system architecture of the final system.

- Demonstrate the actual operations of the final system, including login/logout, data maintenance, and the steps of the operations for fulfilling the user queries, with appropriate UI for displaying the results.

A PowerPoint presentation file should be prepared for the describing the contents of the demonstration. The presentation file should be submitted in form of a soft copy to the Canvas system. The file name of the presentation file should be in this format:

<Tutorial Group> - <Student Name> - Presentation.pptx

For example, ***G4 - Chan Tai Man - Presentation.pptx***

4. Assessment Criteria

The performance of students will be assessed 100% based on the course assignment. The scoring scheme of those activities in completing the course assignment is as follows:

Assessed Items	Scores	
	System Specification	Practical Demonstration
Tutorial 1: Progress review on modelling data objects	5	
Tutorial 2: Progress review on designing database tables	5	
Tutorial 3: Progress review on implementing user queries	5	
Tutorial 4: Practical Demonstration		30
System Specification Report	55	
Total	**70**	**30**

The activities in **Tutorials 1, 2, and 3** are related to reviewing the project progress. They will be evaluated based in following criteria:

Item	Assessment Criteria	Scores
1	**Tutorial 1: progress review on modelling data objects** • The comprehensiveness and correctness of Entity Relationship Diagram for modeling the given data objects.	**5**
2	**Tutorial 2: progress review on designing database tables** • The comprehensiveness and correctness of the specification of database tables in 3NF.	**5**
3	**Tutorial 3: progress review on implementing user queries** • The comprehensiveness and correctness of using SQL statements in implementing the required user queries.	**5**

The **Practical Demonstration (Tutorial 4)** will be evaluated based on the following criteria:

Item	Assessment Criteria	Scores
1	**Practical Demonstration (10-15 mins).** This is used to show that the ideas specified in the system specification are actually implemented in the final system.	
	• Explain the overall system architecture of the final system	10
	• Demonstrate the actual operations of the final system, including login/logout, data maintenance, and the steps of the operations for fulfilling the user queries, with appropriate UI for displaying the results.	20
	Total :	**30**

The **System Specification Report (2000 words)** will be evaluated based on the following criteria:

The contents presented in the *Progress Review* (Tutorial 1, Tutorial 2, and Tutorial 3) would be refined and incorporated to be part of the System Specification Report.

Item	Assessment Criteria	Scores
1	**System Overview** • Explain the importance of the system • Summarize the user requirements (with assumptions, if any)	5
2	**Design Specification** • Model the data objects with Entity Relationship Diagram (ERD) • Transform the ERD into a set of database tables • List the functional dependencies and normalize the tables in 3NF • Use appropriate design models to describe the operational behavior of the system	15
3	**Database Development** • Describe how the database tables are implemented • Specify the SQL statements for creating database tables with primary keys with integrity constraints • Provide sensible data records for each database table for illustration	15
4	**Implementation Tools** • Explain the tools used for development • Describe the use of SQL for implementing user queries • Design test cases for each user query with realistic working examples	10
5	**Evaluation of the approach taken** • Describe the system's limitations and the possibilities for improvement • Describe the possible alternative tools for developing the system	5
6	**Overall Impression of the Report** • Consistent report layout and formatting • Grammar and spelling correctness • List of relevant references	5
	Total :	**55**