

## Assignment A5

### Chapter9:

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1. "Should the existing system be replaced?" is a question that is asked during the \_\_\_\_\_ stage of the SDLC.

- a. planning
  - b. maintenance
  - c. analysis
  - d. implementation
- 

2. Coding, testing, and debugging are part of the \_\_\_\_\_ phase of the SDLC.

- a. implementation
  - b. planning
  - c. analysis
  - d. detailed systems design
- 

3. "What are the requirements of the current system's end users?" is a question asked during the \_\_\_\_\_ phase of the SDLC.

- a. analysis
  - b. planning
  - c. maintenance
  - d. implementation
- 

4. The logical systems design is created during the \_\_\_\_\_ phase of the SDLC.

- a. implementation
  - b. maintenance
  - c. analysis
  - d. planning
- 

5. The last phase in the Database Life Cycle is \_\_\_\_\_.

- a. implementation and loading
  - b. testing and evaluation
  - c. maintenance and evolution
  - d. operation
- 

6. Installing the DBMS, creating the database, and loading or converting the data are part of the \_\_\_\_\_ phase of the DBLC.

- a. testing and evaluation
- b. database initial study
- c. database design
- d. implementation and loading

7. Testing, fine-tuning, and evaluating the database and its applications are part of the \_\_\_\_\_ phase of the DBLC.

- a. database initial study
  - b. implementation and loading
  - c. testing and evaluation
  - d. database design
- 

8. Which of the conceptual design steps determines end-user views, outputs, and transaction-processing requirements?

- a. Database analysis and requirements
  - b. Distributed database design
  - c. Data model verification
  - d. Entity relationship modeling and normalization
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9. Which of the conceptual design steps defines entities, attributes, and relationships?

- a. Distributed database design
  - b. Entity relationship modeling and normalization
  - c. Data model verification
  - d. Database analysis and requirements
- 

10. The first step in developing the conceptual model using ER diagrams is to \_\_\_\_\_.

- a. identify, analyze, and refine the business rules
  - b. complete the initial ER diagram
  - c. define the attributes, primary keys, and foreign keys for each of the entities
  - d. normalize the entities
- 

11. During the Entity-Relationship modeling process, the designer must \_\_\_\_\_.

- a. avoid all ternary relationships
  - b. delete the ER diagram
  - c. make decisions about the placement of primary keys in 1:1 relationships
  - d. make decisions about adding derived attributes to satisfy processing requirements
- 

12. The first step in the ER model verification process is to \_\_\_\_\_.

- a. identify each module's internal transaction requirements
  - b. identify each module and its components
  - c. identify the ER model's central entity
  - d. verify all processes against the ER model
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13. The \_\_\_\_\_ design is used to translate the conceptual design into the internal model for a selected database management system.

- a. logical
  - b. physical
  - c. network
  - d. time
-

14. \_\_\_\_\_ design is the process of selecting the data storage and data access characteristics of the database.

- a. Logical
  - b. Physical
  - c. Time
  - d. Network
- 

15. Once the data have been loaded into the database, the \_\_\_\_\_ tests and fine-tunes the database to ensure that it performs as expected.

- a. database administrator
  - b. systems administrator
  - c. programmer
  - d. manager
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16. The assignment of \_\_\_\_\_ may restrict operations on predetermined objects such as databases, tables, views, queries and reports.

- a. password security
  - b. audit trails
  - c. diskless workstations
  - d. access rights
- 

17. \_\_\_\_\_ are usually provided by the DBMS to check for access violations.

- a. Audit trails
  - b. Diskless workstations
  - c. Access rights
  - d. Security devices
- 

18. Once the database has passed the evaluation stage, it is considered to be \_\_\_\_\_.

- a. finished
  - b. complete
  - c. secure
  - d. operational
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19. Which activity in the SDLC is parallel to implementation and loading in the DBLC?

- a. analysis
- b. detailed design
- c. coding
- d. testing and evaluation

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20. \_\_\_\_\_ design is productive when the data component is composed of a relatively small number of objects and procedures.

- a. Denormalized
  - b. Decentralized
  - c. Centralized
  - d. Normalized
- 

## **Deliverables**

### **MS SQL Server**

#### **Business Rules:**

MyProperty Rentals is a property rental company. The owner wants to contract a database designer to produce reports from the following rental details: Which rental units are rented? Who rented which unit(s)? What were the rental amounts, rental dates and duration? And, other reports. To do so, create a MS SQL Server database from the following business rules:

- Each applicant provides application information.
- Each applicant can sign many rental agreements.
- Each property can book many rental agreements.
- Each property can have one and only one rental agreement at a time.
- An applicant may have several phone numbers, but must provide at least one.
- An applicant may have several occupants living with them (i.e., only one applicant may be listed on the lease, but can have occupants living with them).
- An occupant may have several phone numbers, or none.
- A property may have many room types (e.g., bedroom, bathroom, etc.), and a room type may be available in many properties. Also, room size (dimensions) must be tracked (e.g., 10' x 12', 12' x 12', etc.)
- A property may have many features (e.g., central a/c, pool, furnished, etc.), and a feature may be available in many properties.

#### **Notes:**

- **applicant** data must include at least SSN, driver license or state ID, name, address, phone, work phone, e-mail, DOB, gender, background check (pass/fail), and notes.
- **occupant** data should be the same as applicant; though, the background check should be optional (e.g., children).
- **property** details must include address, type (house, condo, townhouse, duplex, apt., mobile home, room), rental rate, status (available/not available).
- The agreement contract should include when it was signed, start/end dates, and the amount.
- **All tables** \***must**\* include suitable attributes (e.g., first name, last name, address, phone, email, url, etc).

## T-SQL and Diagramming Requirements

### 1. Bb > Notes > Log into SQL Server

**Note:** Do **\*NOT\*** have a diagram window open when attempting to modify your database!

2. Use **\*only\*** **T-SQL** to create tables, relationships, constraints, and data from the above business rules. **\*MUST\*** be populated on CCI's MS SQL Server to receive credit.

3. **Notes: \*ALL\* tables \*must\* include the following checks and defaults:**

- state: default = FL
- **\*all\*** currency values > 0
- **\*all\*** enum values use w/in "IN" clause
- zip: > 0 and <= 999999999

**\*ALL\* FKs: \*Must\* require ON DELETE CASCADE, ON UPDATE CASCADE**

4. Include **five \*unique\* records** for each table

**Note:**

**Some special considerations to be aware of when completing A5:**

1) Incorrect date values **\*are\*** caught by MS SQL Server: for instance, some DBMSs will permit incorrect date values like, '2012-12-32' (only 31 days in December!), or, '2018-06-31' (only 30 days in June!), MS SQL Server will **\*not\*** permit these errors. It will catch those errors. So, **\*be careful\*** to review your create statements, and correctly match them with your insert statements when entering data in your tables.

2) The data in the **room** table uses **single** quotation marks, **\*not\*** double quotation marks. Also, do **\*not\*** use a word processor when coding SQL, use a **\*true\*** text editor! A word processor will include special characters that will cause errors in the SQL parser!

-----  
-- Data for table dbo.room (escape single quotation mark by doubling single quotation mark)  
-- Note: escaping feet; and, entire string wrapped in single quotation marks.  
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```
INSERT INTO dbo.room  
(prp_id, rtp_id, rom_size, rom_notes)
```

VALUES

```
(1,1, '10'' x 10'', NULL),  
(3,2, '20'' x 15'', NULL),  
(4,3, '8'' x 8'', NULL),  
(5,4, '50'' x 50'', NULL),  
(2,5, '30'' x 30'', NULL);
```

```
INSERT INTO dbo.phone
```

```
(app_id, ocp_id, phn_num, phn_type, phn_notes)
```

-- note: unless indicated in notes, if both app\_id and ocp\_id it is shared

VALUES

```
(1, NULL, '5615233044', 'H', NULL),  
(2, NULL, '5616859976', 'C', NULL),  
(5, 5, '8504569872', 'H', NULL),  
(NULL, 1, '5613080898', 'F', 'occupant's number only'),  
-- note how to escape single quotation (w/another single quotation)  
(3, NULL, '8504152365', 'W', NULL);
```

5. Create T-SQL statements for the following exercises, and display their associated query resultsets:
- Create a **transaction** that deletes property #1.
  - Create a **view** to display the property id, property type, property rental rate, all of the room types (names) and associated sizes for **property ID 3**. Name it **v\_prop\_info**.
  - Create a **view** to display the property id, property type, property rental rate, and all of the property feature types for property IDs 4 and 5, order by property rental rate in descending order. Name it **v\_prop\_info\_feature**.
  - Create a **stored procedure** that accepts an applicant's id to display an applicant's social security number, state id number, first and last names, and all of their respective phone numbers, and phone number types. Name it **ApplicantInfo**.
  - Create a **stored procedure** to display **\*all\* phone numbers** and phone types, as well as occupants' social security numbers, state id numbers, first and last names. Display **\*all\* phone numbers**, even if occupants may **\*not\*** have a phone number. Name it **OccupantInfo**.

#### Required:

6. Create a **database diagram**, save as .png file, and upload it to Bb.
- Do **\*not\*** use default arrangement. Appropriately arrange tables according to relationships.
  - Select all tables > rt-click one selected table > Autosize Selected Tables
  - Rt-click > Show Relationship Labels
  - Take screenshot of ERD**  
(Note: Currently, "Copy Diagram to Clipboard" does not show attributes.)
  - Paste in graphics program (e.g., Paint.NET, GIMP, etc.)
  - Save as (.png) **A5\_ERD.png**

#### Helper videos:

- [http://qcitr.com/vids/LIS3784\\_A5a.mp4](http://qcitr.com/vids/LIS3784_A5a.mp4)
- [http://qcitr.com/vids/LIS3784\\_A5b.mp4](http://qcitr.com/vids/LIS3784_A5b.mp4)

#### Clustered vs. Nonclustered Indexes:

- Clustered indexes** sort and store data rows in the table or view based on their key values.
- There can be only **\*one\*** clustered index per table, because the data rows themselves can be stored in only one order.
- The only time data rows in a table are stored in sorted order is when the table contains a clustered index.
- When a table has a clustered index, the table is called a clustered table.
- Nonclustered indexes** have a structure separate from the data rows. A nonclustered index contains the nonclustered index key values and each key value entry has a pointer to the data row that contains the key value.
- Both** clustered and nonclustered indexes can be unique.
- Note: When creating a PRIMARY KEY, a clustered index is automatically created--**\*unless\*** a clustered index already exists.
- Also, there can be many nonclustered indexes--**\*although\*** each new index will increase the time it takes to write new records! **So, have a \*good\* reason for creating them!**