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**IS 5313 Structured Data and Querying**

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https://billrosener.com/teaching/is4293/assignments/assignment4/assignment4-description.html

**Chapter 4 Review Questions**

1. What is a decision?

A **decision** is a selected action that we should take in our current situation. (Page 292).

1. What is data?

Data is the information stored in tables. Data can take many forms (Booleans, strings, numbers, lists, arrays, etc) (Glossary, and general info.)

1. What is information?

Information is “data that’s been presented in a meaningful context,” or data that’s been processed, or the knowledge derived from meaningfully processed and presented data. (Glossary)

1. What is a system? What is an information system?

A system is “a collection of ideas, protocols, and concepts acting together to organize and explain.” An information system is “a system that enables the processing of data.” (Glossary)

1. What is a computer-based information system? Describe the five components of a computer-based information system.

The applications that enable the processing of data. (Glossary) The five components are the following:

1. Hardware (physical computers and devices)
2. Software (applications/code running on computers and devices)
3. Data (information)
4. Procedures (documentation instructing users the proper methods for using hardware or software, and accessing data)
5. People (users, developers, administrators)

(page 292)

1. What is a business process?

A business process is “a protocol or set of rules in a business that governs how things work.” (Glossary)

1. How do information systems support business processes?

Information systems help businesses reach their goals and objectives. (page 292)

1. Describe how information systems include processes.

I don’t quite understand the wording of this question. However, processes and information systems are related in that a process may include information systems (such as logistics or supply chain inventory tracking systems), and information systems may support processes with manufacturing/inventory tracking systems, and in data analytics. (Page 294-ish.)

1. What is systems analysis and design?

Systems analysis and design is the process of creating information systems. (page 294).

1. Describe the systems development life cycle (SDLC) model.

The SDLC model is the typical methodology used to develop information systems in systems analysis and design. (page 294) Steps include the following:

1. System definition
2. Requirements analysis
3. Component Design
4. Implementation
5. Systems Maintenance
6. What is a user requirements document (URD)? What purpose does it serve?

A user requirements document is a deliverable for requirements analysis that contains an approved set of user requirements used to formalize the project team’s understanding of the user’s requirements. (page 296)

1. Name the three stages in the process of developing database systems. Summarize the tasks in each.

Database development is a subset of SDLC consisting of the following stages (page 297):

1. Requirements Analysis: sample forms, reports, queries, and descriptions of update activities are gathered from users.
2. Component Design (aka system design): model is transformed into a database design.
3. Implementation: database is constructed in the DBMS and populated with data.
4. What is a data model, and what is its purpose?

A data model is how the data will be used to create knowledge (glossary). For example, a data model could be a hierarchical one-to-many model.

1. What is a prototype, and what is its purpose?

A prototype is like a “first draft” of a database, or a functional demonstration of what the final product would look like, in order to solicit feedback from users. (page 297)

1. What is a use case, and what is its purpose?

A use case is a detailed description of how a user interacts with a system or application, and it is used to build or see a picture of how to build the data model. (page 298)

1. Give an example of a data constraint.

A short text field with a limit of 2 characters (such as for the 2-letter abbreviation for a state).

1. Give an example of a business rule that would need to be documented in a database development project.

An individual can be a graduate assistant or faculty, but not both.

A graduate assistant must also be a student.

1. Define the termentity, and give an example other than those used in this book.

An entity is data that a user wants to track or store. (page 299). An example is VEHICLE.

1. Explain the difference between an entity class and an entity instance.

An entity class is the table structure, or the column headings (customer name, customer email, customer phone number), and an entity instance is one record from that table (Alice Smith, alice@example.com, 202-555-1212). (page 299)

Also: An entity class is the cookie cutter, and an entity instance is one cookie made by that cookie cutter.

1. Define the term attribute and give examples for the entity you described in question 4.18.

An attribute describes a characteristic of an entity (page 300). For the VEHICLE entity, attributes could be VehicleMake, VehicleModel, ModelYear, VIN, PurchaseDate, and ServiceDate.

1. Define the term identifier, and indicate which attribute defined in your answer to question 4.20 identifies the entity.

An identifier is one or more attributes that refer to a specific entity instance (page 300). In the example above, the VIN could be the identifier.

1. Define the term composite identifier and give an example other than those used in this book.

A composite identifier is an identifier consisting of two or more attributes (page 300). An example could be PartNumber and PartColor.

1. Define the term relationshipand give an example other than those used in this text.

A relationship is a link or association between two entities (page 301). An example could be VIN and VehicleOwner.

1. Explain the difference between a relationship class and a relationship instance.

A relationship class the link or association between entity classes; a relationship instance is the link or association between entity instances (page 301).

1. Define the term degree of relationship. Give an example, other than one used in this text, of a relationship greater than degree two.

The degree of relationship is the number of entity classes in a relationship. An example might be a client account where there are entities for CLIENT, CONTACT, PROJECT, and PROJECT\_TEAM.

**Entity-Relationship Model**

