1. What is the UoD for the database presented in Chapter 1?

In Chapter 1.2 page 6 the universe of discourse(UoD) is a university. For a university some of the information includes students, courses, and grades.

1. What is specified when defining a database?

In Chapter 1.2 page 7 when defining a database it is necessary to specify the structure of the files, to do this specify the data elements. These data elements are *attributes* of the files, in the university example a STUDENT is a file and would have data elements such as Name, Student\_number, class, and Major. Each data element also needs a data type, this is to specify what the data element is, data types can be things like Strings, Ints, or Chars.

The Data types, structures, and constraints

1. What type of data describes the primary structure of a database?

In Chapter 1.3.1 page 10 meta-data describes the primary structure of a database. This is found in the database approach, in this approach the database system contains the database and complete definition of the structure and constraints of the database. The definition is stored in the DBMS catalog. The catalog contains information such as file structure, type, and storage and the constraints on the data. This information in the catalog is the meta-data. In new systems meta-data isn’t required, instead it is self-describing.

1. What two properties must a DBMS impose upon transactions to ensure the database remains logically correct? Describe each.

In Chapter 1.3.4 page 14 the two properties a DBMS impose upon transactions to ensure the database remains logically correct are the isolation property and the atomicity property. The Isolation property ensures each transaction executes in isolation from each transaction. The atomicity property ensures all or none of the database operations are executed in a transaction.

1. What is a referential integrity constraint?

In Chapter 1.6.8 page 21 a referential integrity constraint is described as a constraint on a record specifying that the record in one file must relate to records in another file. This is a type of integrity constraint.

1. Which relational databases have the largest market share? Provide a screenshot of and a link to the site where you obtained your information. Ensure your reference includes at least two of the following databases: MySQL, Oracle, PostgreSQL, or SQL Server.

Graphical user interface, application

Description automatically generated

[Most popular relational DBMS 2022 | Statista](https://www.statista.com/statistics/1131568/worldwide-popularity-ranking-relational-database-management-systems/#:~:text=As%20of%20January%202022%2C%20the%20most%20popular%20relational,Microsoft%20SQL%20server%20rounded%20out%20the%20top%20three.)

1. Describe each part of a three-schema architecture.

In Chapter 2.2.1 the three parts of three-schema architecture are the internal level, conceptual level, and external/view level. The internal level has an internal schema. The internal schema describes the physical storage of the database, a physical data model is used to describe the detail, storage, and paths of the database. The conceptual level has a conceptual schema which describes the structure of the whole database for users. In this level the details describe the entities types, relationships, operations, and constraints instead of the physical storage. A representational data model is normally used to show the database system. The external/view level has a number of enteral schemas/user views, these enteral schema are used to describe a particular part of the database that the user is interested in and only shows that part. A representational data model is commonly used for this level to show the database system.

1. What is a schema?

In Chapter 2.1.2 a database schema is defined as a description of a database. The schema for a database is made in the database design and is not expected to change often. The schema defines how the data will be organized, and a displayed schema is called a schema diagram.

1. Provide a scenario where a business would implement an ETL solution. Provide details in your scenario.

A scenario where a business would implement an ETL solution is where the business has a lot of unorganized raw data and they want to have all of the data sorted, organized and in one place. For the ETL solution a data analyst would start with extraction (E) and take all the data and compile it all in one place cleaning it up by organizing it by date, size, and source. For transform (T) the data analyst would convert, reformat, and prep/cleanse the data to be stored by getting rid of irrelevant data. For Loading (L) the analyst would load the transformed data with bulk load and for questionable datasets the analyst would load through SQL insets.

1. On the job board of your choice (like indeed.com), search for at least three different full-stack developer positions. Provide a link to the job ad and, below the link, list what database requirements there are for the job.

[Full-stack Developer Jobs, Employment in Lake Stevens, WA | Indeed.com](https://www.indeed.com/jobs?q=full-stack+developer&l=Lake+Stevens%2C+WA&from=searchOnHP&vjk=0db879d88edc1120)

Expert-level knowledge of JDBC, backend SQL, database-stored procedures and JPA frameworks. hands-on Java development experience.

[Full-stack Developer Jobs, Employment in Lake Stevens, WA | Indeed.com](https://www.indeed.com/jobs?q=full-stack+developer&l=Lake+Stevens%2C+WA&from=searchOnHP&vjk=76a77c5dbd6e6f71)

* Full stack development
* Development on cloud based platforms i.e., Azure including Azure Containers
* Developing infrastructure e.g., build and test automation, deployment, logging, micro services configuration, etc.

[Full-stack Developer Jobs, Employment in Lake Stevens, WA | Indeed.com](https://www.indeed.com/jobs?q=full-stack+developer&l=Lake+Stevens%2C+WA&from=searchOnHP&vjk=e58e2e3c5940ff4a)

Develop full-stack mobile application features in a variety of languages, including but not limited to Javascript, Obj-C, Java, and PHP

experience in React or React Native development