1. Describe what a Mainframe architecture is.

   A Mainframe is an architecture that is a type of computer architecture and is typically used for large-scale computing tasks such as data processing and transaction processing. It is mainly designed to handle large volumes of data and users, and where all data input and output are processed usually at a central location.

   a. Describe when and why this architecture would be used (even today)

      It is typically used in large organizations such as banks, insurance companies, and government agencies. It often a good choice when an organization needs to handle high volume transactions and large-scale data management.

2. Describe what a Client-Server architecture is.

   A Mainframe is an architecture that is a type of computer architecture where client devices or applications request services or resources from a central server.

   a. Explain what tiers are in a Client-Server model.

      The Client-Server model consist of 3 tiers:

      A client: responsible for presenting information to the user and receiving input from the user, includes the client application, like a web browser or mobile app, and the user interface components.

      Application: responsible for processing requests from the presentation tier and performing the necessary business logic to provide the requested services or resources. This tier has an application server that runs the application logic, and any middleware components needed to connect to the database.

      Resource manager/database : responsible for storing and retrieving data. Usually a database that contains the data/information for the server

3. Describe a "monolithic" application architecture and provide an example.

   A monolithic application architecture is when the entire server/application is contained in a single unit and the database is a single a unit. Also, all of the server's functions and services are deployed and run on a single platform.

   a. Explain where the monolith is installed in an n-tier architecture.

      In an n-tier architecture, the monolith is a type of software architecture where all the application components are tightly coupled and deployed as a single service. In other words, the entire application runs on a single server, the user interface, business logic, and data access layers all working together.

4. Summarize what defines a microservices architecture.

   The monolith is a form of software architecture in an n-tier architecture where all the application components are deployed as a single service and are closely connected. In other words, the user interface, business logic, and data access layers all function together as a single program, running on a single server.

   a. Explain some of the key expected business benefits of this model for an organization that uses it to deploy information systems.
      i. Scalability: Each microservice can be scaled independently, allowing organizations to respond to make changes quickly and easily in demand for specific services. Unlike a monolith, where if one service needs to be upgraded, the rest of the system would also need to be upgraded.
      ii. Lower cost: As services can be small, independent, and loosely coupled, its much easier to design a system that fits the exact requirements needed, so costs stay low.
      iii. Upgradability: Services can be deployed independently which allows for smaller, individual upgrades, so no downtime is needed.
      iv. Diagnostics: As internal services are independent from others, it is much easier to pin-point where a bug or issues. Again, this reduces overall downtime, but could also result in no downtime needed, as only certain services go offline, not the entire system.