Take-home System Design Question

The objective of this module is to evaluate whether a candidate can design a complex system including multiple components like web servers, databases, etc. to meet both functional and non-functional requirements (e.g., low latency, scalable, reliable). The candidate should also consider different approaches with pros and cons.

Script

You will design a **real-time collaborative TODO list application** in which a user can:

- Create/update/delete a TODO list.
- Create a TODO with media content such as images and up to 4-minute videos.
- Share TODO lists with other users with either edit or view-only permission.
- Edit the shared lists while others can see the updates immediately.

The application is expected to support

- 100M daily active users
- large groups of users collaborating on the same TODO lists

We expect a concise one- or two-pager document that includes

- An architecture diagram showing the high-level system design covering key components like clients, servers, and databases. You are welcome to use Google Drawings, Miro, Lucid, or other online whiteboard tools.
- Scalability strategy
- A short reasoning about why those components are chosen
- Data models for all used data storage
- Any low-level details you think require special considerations.