Elements of computer science: DB assignment 1   
Date: 19th October 2025

1. Implementing data duplication might be beneficial in uses cases which require heavy get request where you are only fetching data. For example in big data warehouses or a user dashboard service which only requires to display data.  
   We might implement multiple data servers which has duplicate data. But we have to manage write request.  
     
   Advantages:  
   Faster request: The processing can be decreased greatfully because multiple data servers are ready to process the request.  
   Scalability: Scalability is pretty easy as it can be scaled horizontally by putting more data servers  
   Data Recovery: This might be another great advantage, in case of some hazard or data loss, the data can be recovered easily from the adjacent data server  
   Reduced dependacncy on primary node: Dependency on primary node is greatly reduced even in a case of system failure for primary failure the system will still fine as adjacent nodes are available to handle the requests  
     
   Disadvantages:  
   Difficulty to maintain integrity: In case of a write request, a infra should be implemented to modify the respective data across all data centres. In complicated systems it also inceases the risk of data mismatch resulting in a flawed system  
   Increased cost: This operation might become costly as the system evolves. Also mainting these extra data sets can be costly to implement
2. For a university, data can be huge and widespread and we require quick indexing  
     
   to implement a reliant database for this university, the three most important user groups would be  
     
   1 student: This user group will contain various data of the student studying, information about their courses grades, etc  
   2Professors and staff: This user group will primarily focus on storing details of professors and staff working Ex. In it administration etc, it can have details like personal info, salary, subjects, courses etc.

3Librarian: This user group will focus on storing details about the librarian who has to manage a huge warehouse of books  
  
  
Advantages are  
1) it implements a centre where data can be stored secured and its safe, tamper free and maybe backed up as well to mitigate data loss   
2) it makes any data readily available without going through any paper or books to retrieve the data it is readily available by querying the data. This will greatly reduce time   
3) implementing the database system allows us to shift a lot of processes online reducing human resource reducing time wasted and making it fast proficient and technologically advanced