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### RHYDON Term Project Final Report

Estimated size of three chosen tables initially and in 3 and 12 months:

Table Name	Initial # of rows	# of rows in 3 months	# of rows in a year	Avg. length
Animal	1	250	500	4
Aquarium	1	1	1	4
Employees	3	50	100	8

We are expecting around 30 concurrent users to our database including the entrance turnstiles, employers and general management of the aquarium information throughout the day.

The table below shows the expected number of transactions in 3 and 12 months:

Table Name	# of transactions in 3 months	# of transactions in a year
Animal	270	550
Aquarium	0	0
Employees	55	110

Different tables will frequently use different DML operations, this table shows the expected usage of these operations is the same three tables:

Table Name	INSERT	DELETE	UPDATE	SELECT
Animal	Most used	Expected	Expected	Expected
Aquarium	Not expected	Not expected	Not expected	Most used
Employees	Most used	Expected	Expected	Expected

We would use RAID 10 (0 + 1) as our disk structure since it's both fast and secure. Mirroring of data allows us to save data if anything goes wrong. Also the fact that data is striped between different disks allow us to read and write to different disks simultaneously to make transactions faster than other alternatives. We would only need a single tablespace since this project is relatively small in size.

Our main backup strategy is to keep logs about transactions. If database fails at some time, we will keep logs of each transaction: what data they modified and were they committed or not. From these information, we are able to restore the database to its last consistent state by rolling committed transactions forward. The transactions which are rolled back may be set on their course for another trial of completion and commitment. This backup strategy is enough for our database, since it is not overwhelming to keep logs for a relatively small database, and it won't take an enormous time to get the whole system back. For the times our database is out, we will try to keep a database in reserve to save incoming information while our main server is down. Then, these transactions in the reserve database are committed after the main database is restored.

The security strategy for this project is to use two separate user types: database manager and regular employee. Employees will only have access to update and select operations, this way they will be able to do their daily tasks without much problem. If they ever need to add or delete some data, they will request managers to assist them. This allows us to protect our data from mistakes or malintentions of regular employees that probably wouldn't have much knowledge of databases. Managers on the other hand will be trained to use databases and each one will have separate usernames so that each operation will be trackable to its' operator. This way there will be almost no mistakes, and if any manager willingly does something wrong for some reason, we will be able to know who did what.

Our project mainly followed a smooth course, achieving nice feedback throughout the assignments. However, that doesn't mean it is perfect, there are small details we could have strived for in the course of two extra weeks. We could have aimed for a higher normalization for our project. BC normal form is good enough to maintain, but it is not the best option we have, since higher normalizations mean more stable databases, we could have spent more time on perfecting our normalization. Another point which could use some extra sharpening would be visitor information. In our project, we only save the customers' age. This allows for limited data mining opportunities, which is not a problem in this class but would be a major missed opportunity in practice, since it is highly valuable in this era. That would be one of the real money-making aspects of our aquarium, thus we would need to create such a perspective and we would want to in the hypothetically given two weeks. There might be other aspects we could hone, but the most important ones that may make a difference are the ones listed above.