**CS 425 – Database Organization**

**Fall 2023**

Homework 1.1

Group Members:

Shriya Prasanna (A20521733)

Girish Rajani-Bathija (A20503736)

Due Date: 9/3/23

Contributions:  
Both members completed all questions together, compared/discussed answers, and then took 1 file as a submission.

Notes:

For this assignment, Microsoft SQL Server was used but for future assignments, MySQL Workbench will be used. Permission was granted from the professor for this assignment.

Database Schema Implementation:

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Qn 1.

Get everything in the Sailors table.

select \* from Sailors

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Get sailor ID, rank & age of all sailors, ordered from highest to lowest rank. Rank is 10 times rating.

select SID, Rating\*10, Age from Sailors Order By Rating desc

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Get alphabetical list of sailors with rating less than 10.

Select sname from Sailors where Rating<=9 order by sname

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Find how much deposit money there is in total and how many tuples are in the reserves table.

select sum(deposit) as TOTAL, count(deposit) as HOWMANY from reservesA screenshot of a computer

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Get all info on boats in Fishhoek but I’m not sure how you spell Fishoek.

Select \* from Boats where Location like '\_is%k'

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In what locations are boats kept?

select distinct(location) from boats

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Get the names of all Boats that have a fee value recorded in the database.

select bname from boats where fee is not null

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Get ID of all boats that have not been reserved.

select BID from boats

except (select BID from reserves)

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Get all reservation info, including all details on the boats being reserved.

select \* from reserves, boats

where reserves.BID=boats.BID

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For all reservations, get the name of the sailor, along with the day and name of the boat booked.

select sname,day,bname

from sailors as S, reserves as R, boats as B

where S.SID= R.SID and R.BID =B.BID

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Get the average deposit paid for each boat.

SELECT BID, AVG(DEPOSIT) FROM RESERVES

GROUP BY BID

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Get the average deposit paid for each boat that has been booked by more than one person.

SELECT BID, AVG(DEPOSIT)FROM RESERVES

GROUP BY BID

HAVING COUNT (DISTINCT SID) > 1

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Get the average firm deposit paid for each boat that has been booked by more than one person, in increasing order of amount. A firm deposit is one which exceeds R10.

SELECT BID, AVG(DEPOSIT) AS AMOUNTDEPOSIT

FROM RESERVES

WHERE DEPOSIT >10

GROUP BY BID

HAVING COUNT (DISTINCT SID)>1

ORDER BY AMOUNTDEPOSIT

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Get name & rating of sailors with rating exceeding 7 who made any reservation with 0 deposit.

SELECT SNAME, RATING FROM SAILORS

WHERE RATING > 7 AND SID IN (

SELECT SID FROM RESERVES WHERE DEPOSIT =0)

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Get name of boats located in a place other than Hout Bay or Fish Hoek.

SELECT BNAME FROM BOATS WHERE LOCATION NOT IN ('HOUT BAY', 'FISH HOEK')



Get names of boats having a fee larger than any boat located in Hout Bay.

SELECT DISTINCT BNAME FROM BOATS

WHERE FEE> some

(SELECT FEE FROM BOATS

WHERE LOCATION= 'HOUT BAY')

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Get names that are in both the sailors and the captains relations.

SELECT SNAME FROM SAILORS WHERE EXISTS

(SELECT \* FROM CAPTAINS WHERE CAPTAINS.SID= SAILORS.SID)



Get names of boats that have exactly 1 reservation.

SELECT BNAME FROM BOATS AS B WHERE UNIQUE

(SELECT BID FROM RESERVES WHERE RESERVES.BID=B.BID)

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**The above error persists in both Microsoft SQL Server and MySQL when running the professors’ code so our group attempted a different approach shown below.**

Our Approach:

SELECT BNAME FROM BOATS, RESERVES

WHERE BOATS.BID = RESERVES.BID

GROUP BY BNAME

HAVING COUNT(RESERVES.BID) = 1

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Get sailor ID and total deposit paid for sailors who have booked more than 1 boat.

SELECT SID, TOTAL\_DEPOSIT FROM

(SELECT SID, COUNT(BID), SUM(DEPOSIT)

FROM RESERVES

WHERE DEPOSIT IS NOT NULL AND DEPOSIT > 0 GROUP BY SID)

RESULT (SID, NUM\_BOATS, TOTAL\_DEPOSIT) WHERE NUM\_BOATS>1

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Get all reservation info including details of the boat booked.

SELECT \* FROM BOATS

INNER JOIN RESERVES ON BOATS.BID= RESERVES.BID

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Get all information on every boat. If a boat has reservations, including all its reservations info.

SELECT \* FROM BOATS

LEFT OUTER JOIN RESERVES ON BOATS.BID = RESERVES.BID A table with numbers and letters

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Create a new tuple for the boat named “Nino” which has fee R150, BID 110, and is in Fish Hoek.

INSERT INTO BOATS VALUES ('Nino', 110,150, 'Fish Hoek')

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Remove all bookings from Reserves where there is no deposit.

DELETE from reserves where DEPOSIT IS NULL OR DEPOSIT = 0

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Increase the fee of every boat by 12%.

update boats

set fee = fee\*1.12

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Make a view called Bookings which hides the Deposit value i.e. only has the other 3 attributes.

CREATE VIEW Bookings as

SELECT SID, BID, DAY FROM RESERVES;

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Create a table called Reserves with 3 integer attributes BID, SID & deposit, and a date attribute. Allow only deposit to be omitted, and ensure SID and BID values exist in the database. When someone books a boat it is for the whole day.

CREATE TABLE RES

(BID INTEGER NOT NULL,

SID INTEGER NOT NULL,

DAY DATETIME NOT NULL,

DEPOSIT INTEGER,

PRIMARY KEY (BID,SID),

CHECK(BID IN (SELECT BID FROM BOATS)), CHECK(SID IN (SELECT SID FROM SAILORS)))

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**The above error persists in both Microsoft SQL Server and MySQL when running the professors’ code so our group attempted a different approach shown below.**

Our approach:

CREATE TABLE RESERVES

(BID INTEGER NOT NULL,

SID INTEGER NOT NULL,

DAY DATETIME NOT NULL,

DEPOSIT INTEGER,

PRIMARY KEY (BID,SID),

Constraint FK\_Reserves\_SID foreign key (SID) references Sailors (SID),

Constraint FK\_Reserves\_BID foreign key (BID) references Boats(BID));

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Add a new attribute NEEDSREPAIR to the Boats table. It is usually “N”.

ALTER TABLE BOATS

ADD NEEDSREPAIR CHAR(1) DEFAULT 'N'

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We should not be ageist. Remove the Age attribute.

ALTER TABLE SAILORS

DROP COLUMN AGE

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Remove the Captains relation altogether so that nobody can try insert or use Captains in future.

DROP TABLE CAPTAINS

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Relational Algebra

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