CS275 – Intro to Databases

SQL - *Chap.4*

Select

- Basic form
  - SELECT [DISTINCT] select-list
  - FROM from-list
  - WHERE qualification

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names and ages of all sailors

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names and ages of all sailors
  - SELECT DISTINCT S.sname, S.age
  - FROM Sailors S

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names and ages of all sailors
  - SELECT S.sname, S.age
  - FROM Sailors S

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find all sailors with a rating over 7

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find all sailors with a rating over 7
  - SELECT S.sid, S.sname, S.rating, S.age
  - FROM Sailors AS S
  - WHERE S.rating > 7

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find all sailors with a rating over 7
  - SELECT *
  - FROM Sailors AS S
  - WHERE S.rating > 7

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find all sailors with a rating over 7
  - SELECT *
  - FROM Sailors
  - WHERE rating > 7

SELECT

- What really happens?
  1. Compute the cross-product of the tables in the from-list
  2. Delete rows that fail the qualification conditions
  3. Delete all columns that do not appear in the select-list
  4. If DISTINCT is specified, eliminate duplicate rows

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of the sailors who have reserved boat 103

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of the sailors who have reserved boat 103
  - SELECT S.sname
  - FROM Sailors S, Reserves R
  - WHERE S.sid=R.sid AND R.bid = 103

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of the sailors who have reserved boat 103
  - SELECT S.sname
  - FROM Sailors S, Reserves R
  - WHERE R.bid = 103

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of the sailors who have reserved boat 103
  - SELECT sname
  - FROM Sailors, Reserves
  - WHERE Sailors.sid=Reserves.sid AND bid = 103

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of the sailors who have reserved boat 103
  - SELECT sname
  - FROM Sailors NATURAL JOIN Reserves
  - WHERE bid = 103

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the ID's of the sailors who have reserved a red boat

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the ID's of the sailors who have reserved a red boat
  - SELECT R.sid
  - FROM Boats B, Reserves R
  - WHERE Boats.bid=Reserves.bid AND B.color='red'

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of the sailors who have reserved a red boat

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of the sailors who have reserved a red boat
  - SELECT S.Sname
  - FROM Sailors S, Boats B, Reserves R
  - WHERE S.sid=R.sid AND B.bid=R.bid AND B.color='red'

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of the sailors who have reserved at least one boat
  - SELECT S.Sname
  - FROM Sailors S, Reserves R
  - WHERE S.sid=R.sid

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of the sailors who have reserved at least one boat
  - SELECT DISTINCT S.Sname
  - FROM Sailors S, Reserves R
  - WHERE S.sid=R.sid

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of the sailors who have reserved at least one boat
  - SELECT DISTINCT S.sname
  - FROM Sailors S, Reserves R
  - WHERE S.sid=R.sid

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Compute increments for the rating of people who have sailed two different boats on the same day.

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Compute increments for the rating of people who have sailed two different boats on the same day
  - SELECT S.sname, S.rating+1 AS rating
  - FROM Sailors S, Reserves R1, Reserves R2
  - WHERE S.sid = R1.sid AND S.sid = R2.sid AND R1.day = R2.day AND R1.bid <> R2.bid

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the ages of sailors whose name begins and ends with B and has at least three characters

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the ages of sailors whose name begins and ends with B and has at least three characters
  - SELECT S.age
  - FROM Sailors S
  - WHERE S.sname LIKE 'B_%B'

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the ages of sailors whose name begins and ends with B and has at least three characters
  - SELECT S.age
  - FROM Sailors S
  - WHERE S.sname LIKE 'B_B'

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the ages of sailors whose name begins and ends with B and has at least three characters
  - SELECT S.age
  - FROM Sailors S
  - WHERE S.sname LIKE 'B%B'

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of sailors who have reserved a red or a green boat

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of sailors who have reserved a red or a green boat
  - SELECT S.sname
  - FROM Sailors S, Reserves R, Boats B
  - WHERE S.sid = R.sid AND R.bid = B.bid AND (B.color='red' or B.color='green')

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of sailors who have reserved both a red and a green boat

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of sailors who have reserved both a red and a green boat
  - SELECT S.sname
  - FROM Sailors S, Reserves R1, Reserves R2 Boats B1, Boats B2
  - WHERE S.sid = R1.sid AND R1.bid = B1.bid AND B1.color='red' AND S.sid = R2.sid AND R2.bid=B2.bid AND B2.color='green'

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of sailors who have reserved both a red and a green boat
  - SELECT S1.sname
  - FROM Sailors S1, Reserves R1, Boats B1
  - WHERE S1.sid = R1.sid AND R1.bid = B1.bid AND B1.color='red'
  - INTERSECT
  - SELECT S2.sname
  - FROM Sailors S2, Reserves R2, Boats B2
  - WHERE S2.sid = R2.sid AND R2.bid = B2.bid AND B2.color='green'

- Note: There isn't INTERSECT in MySQL

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the names of sailors who have reserved both a red or a green boat
  - SELECT S1.sname
  - FROM Sailors S1, Reserves R1, Boats B1
  - WHERE S1.sid = R1.sid AND R1.bid = B1.bid AND B1.color='red'
  - UNION
  - SELECT S2.sname
  - FROM Sailors S2, Reserves R2, Boats B2
  - WHERE S2.sid = R2.sid AND R2.bid = B2.bid AND B2.color='green'

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the sids of all sailors who have reserved a red boat but not a green boat
  - SELECT R1.sid
  - FROM Reserves R1, Boats B1
  - WHERE R1.bid = B1.bid AND B1.color='red'
  - EXCEPT
  - SELECT R2.sid
  - FROM Reserves R2, Boats B2
  - WHERE R2.bid = B2.bid AND B2.color='green'

- Note: There isn't EXCEPT in MySQL

SELECT

- Sailors(<u>sid:integer</u>, sname:string,rating:integer,age:real)
- Boats(<u>bid:integer</u>, bname: string, color: string)
- Reserves(<u>sid:integer, bid: integer, day: date</u>)

- Find the sids of all sailors who have a rating of 10 or reserved boat 104
  - SELECT S.sid
  - FROM Sailors S
  - WHERE S.rating = 10
  - UNION
  - SELECT R.sid
  - FROM Reserves R
  - WHERE R.bid =104