

CSE 111 – DATABASE SYSTEMS

Quiz 5 (30 points)

Consider the following relational schema and corresponding sample data:

Classes (*class, type, country, numGuns, bore, displacement*)

Ships (*name, class, launched*)

Battles (*name, date*)

Outcomes (*ship, battle, result*)

<i>class</i>	<i>type</i>	<i>country</i>	<i>numGuns</i>	<i>bore</i>	<i>displacement</i>
Bismarck	bb	Germany	8	15	42,000
Iowa	bb	USA	9	16	46,000
Kongo	bc	Japan	8	14	32,000
North Carolina	bb	USA	9	16	37,000
Renown	bc	Britain	6	15	32,000
Revenge	bb	Britain	8	15	29,000
Tennessee	bb	USA	12	14	32,000
Yamato	bb	Japan	9	18	65,000

<i>name</i>	<i>class</i>	<i>launched</i>
California	Tennessee	1915
Haruna	Kongo	1915
Hiei	Kongo	1915
Iowa	Iowa	1933
Kirishima	Kongo	1915
Kongo	Kongo	1913
Missouri	Iowa	1935
Musashi	Yamato	1942
New Jersey	Iowa	1936
North Carolina	North Carolina	1941
Ramillies	Revenge	1917
Renown	Renown	1916
Repulse	Renown	1916
Resolution	Revenge	1916
Revenge	Revenge	1916
Royal Oak	Revenge	1916
Royal Sovereign	Revenge	1916
Tennessee	Tennessee	1915
Washington	North Carolina	1941
Wisconsin	Iowa	1940
Yamato	Yamato	1941

<i>name</i>	<i>date</i>
Denmark Strait	05/24/41
Guadalcanal	11/15/42
North Cape	12/26/43
Surigao Strait	10/25/44

<i>ship</i>	<i>battle</i>	<i>result</i>
California	Surigao Strait	ok
Kirishima	Guadalcanal	sunk
Resolution	Denmark Strait	ok
Wisconsin	Guadalcanal	damaged
Tennessee	Surigao Strait	ok
Washington	Guadalcanal	ok
New Jersey	Surigao Strait	ok
Yamato	Surigao Strait	sunk
Wisconsin	Surigao Strait	damaged

Create the tables in the relational schema such that they satisfy the following constraints:

- There are no two tuples in **Classes** with the same **class** value.
- The possible values for **type** in **Classes** are {bb,bc}.
- The value of **country** in **Classes** cannot be NULL.

- There are no two `Ships` with the same `name`.
- There is a referential integrity constraint from `Ships.class` to `Classes.class` that is handled by `CASCADE` operations. Moreover, `class` in `Ships` cannot be `NULL`.
- There is a referential integrity constraint from `Outcomes.ship` to `Ships.name` that is handled by `SET NULL` operations.
- There is a referential integrity constraint from `Outcomes.battle` to `Battles.name` that is handled by `CASCADE` operations.
- The possible values for `result` in `Outcomes` are `{ok, sunk, damaged}`.

Perform the following operations on the relational schema in the exact order given below:

1. Populate every table with the corresponding sample data. **(2 points)**
2. Delete all the `Classes` with a `displacement` larger than 50,000 or with `numGuns` larger than 10. **(4 points)**
3. For every `Ship` from `USA` that has `class` different than the `name` of the `Ship`, create a `Class` tuple that has `class` equal to the `Ship name`. The other attributes in `Classes` keep the same value as in the current `class` of the `Ship`. Update the `class` of every `Ship` for which a new `Class` is created to the new `Class`. **(5 points)**
4. Delete “North Cape” from `Battles`. **(4 points)**
5. Update the “Guadalcanal” battle to “North Cape” in `Outcomes`. **(4 points)**
6. Rename “Surigao Strait” to “Strait of Surigao” in `Battles`. **(4 points)**
7. Delete all the `Ships` that belong to `Classes` having more than 4 `Ships`. **(5 points)**
8. Print all the tuples in `Ships`. **(1 points)**
9. Print all the tuples in `Outcomes`. **(1 points)**

You have to submit a script file `quiz-5.sql` that contains the SQL statements corresponding to all the required tasks. We will grade your quiz by running the `quiz-5.sql` file on an empty database and checking the output. You should test it the same way. `quiz-5.sql` is the only file you have to turn in.