
CS246: Database Management Systems Lab

Lab # 12 (1 Questions, 125 Marks)

Lab session: AL1

Held on: 05-Apr-2024 (Fri)

Lab Timings: 14:00 to 17:00 Hours Pages: 5

Submission time: 16:45 Hrs, 05-Apr-2024

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1. This lab theme is centered around section 5.3 Triggers of the text book *Database System Concepts* Abraham Silberschatz, Henry F Korth & S. Sudarshan.
2. Manual pages for trigger are attached.
3. Some of the tasks are so designed to have errors. You should not remove them. Instead demonstrate the error as it is.

Question 1: (125 points)

Using MySQL perform the following tasks:

Task 01 (1 mark) Create a database named *week12*

Task 02 (3 marks) Perform the following tasks.

1. (1 mark) Create **sailors** table with the following description

column #	name	data type	constraint
1	sid	int	primary key
2	sname	char(50)	None
3	rating	int	None
4	age	decimal(3,1)	None

2. (1 mark) Create **boats** table with the following description

column #	name	data type	constraint
1	bid	int	primary key
2	bname	char(50)	None
3	bcolor	char(50)	None

3. (1 mark) Create **reserves** table with the following description

column #	name	data type	constraint
1	sid	int	refers to sailors
2	bid	int	refers to boats
3	day	char(50)	None
sid, bid, day is primary key			
sid foreign key cascade on update			
sid foreign key cascade on delete			
bid foreign key cascade on update			
bid foreign key cascade on delete			

Task 03 (5 marks) Create the following log tables as per the specification given below

1. (1 mark) **sailors_log**

column #	name	data type	values
1	sid	int	
2	event_ba	char(50)	{before, after}
3	ops	char(50)	{insert, update, delete}
4	date_time	datetime	system time

2. (1 mark) **boats_log**

column #	name	data type	values
1	bid	int	
2	event_ba	char(50)	{before, after}
3	ops	char(50)	{insert, update, delete}
4	date_time	datetime	system time

3. (1 mark) **reserves_log**

column #	name	data type	values
1	sid	int	
2	bid	int	
3	day	char(10)	
4	event_ba	char(50)	{before, after}
5	ops	char(50)	{insert, update, delete}
6	date_time	datetime	system time

4. (1 mark) **sailors_log_log**

column #	name	data type	values
1	sid	int	
2	event_ba	char(50)	{before, after}
3	ops	char(50)	{insert, update, delete}
4	date_time	datetime	system time

5. (1 mark) **sailors_log_log_log**

column #	name	data type	values
1	sid	int	
2	event_ba	char(50)	{before, after}
3	ops	char(50)	{insert, update, delete}
4	date_time	datetime	system time

Task 04 (3 marks) Populate data

1. (1 mark) populate the **sailors** table from the file **sailors01.csv**
2. (1 mark) populate the **boats** table from the file **boats01.csv**
3. (1 mark) populate the **reserves** table from the file **reserves01.csv**

Task 05 (45 marks) Create the following triggers

1. (5 marks) Create a trigger on **sailors** table say **sailor_t1**. Whenever a row is inserted into this table, and before the row is inserted this trigger should insert a record into **sailor_log** table with **sid** of the row about to be inserted, **event_ba**="before", **ops**="insert"

2. (5 marks) Create a trigger on **boats** table. Whenever a row is inserted into this table, and before the row is inserted this trigger should insert a record into **boats_log** table with **bid** of the row about to be inserted, **event_ba="before"**, **ops="insert"**
3. (5 marks) Create a trigger on **reserves** table. Whenever a row is inserted into this table, and before the row is inserted this trigger should insert a record into **reserves_log** table with **sid**, **bid**, **day** of the row about to be inserted, **event_ba="before"**, **ops="insert"**
4. (5 marks) Create a trigger on **sailors** table. Whenever a row is updated, and after the row is updated this trigger should insert a record into **sailor_log** table with **sid** of the row about to be inserted, **event_ba="after"**, **ops="update"**
5. (5 marks) Create a trigger on **boats** table. Whenever a row is updated, and after the row is updated this trigger should insert a record into **boats_log** table with **bid** of the row about to be inserted, **event_ba="after"**, **ops="update"**
6. (5 marks) Create a trigger on **reserves** table. Whenever a row is updated, and after the row is updated this trigger should insert a record into **reserves_log** table with **bid** of the row about to be inserted, **event_ba="after"**, **ops="update"**
7. (5 marks) Create a trigger on **sailors** table. Whenever a row is deleted, and after the row is deleted this trigger should insert a record into **sailor_log** table with **sid** of the row about to be inserted, **event_ba="after"**, **ops="deleted"**
8. (5 marks) Create a trigger on **boats** table. Whenever a row is deleted, and after the row is deleted this trigger should insert a record into **boats_log** table with **bid** of the row about to be inserted, **event_ba="after"**, **ops="deleted"**
9. (5 marks) Create a trigger on **reserves** table. Whenever a row is updated, and after the row is updated this trigger should insert a record into **reserves_log** table with **bid** of the row about to be inserted, **event_ba="after"**, **ops="update"**

Task 05 (27 marks) populate data and show the log files

1. (1 mark) populate the **sailors** table from the file **insert-sailors02.csv**
2. (1 mark) populate the **boats** table from the file **insert-boats02.csv**
3. (10 mark) populate the **reserves** table by
 - (a) randomly generating a **sid** from **insert-sailors02.csv** entries
 - (b) randomly generating a **bid** from **insert-boats02.csv** entries
 - (c) randomly generating a **day** between 2024-01-01 and 2024-12-31
 - (d) Insert this record into **reserves** table
 - (e) Continue insert until every sailor is reserved each bid two times
4. (1 mark) list the contents of **sailors_log** table
5. (1 mark) list the contents of **boats_log** table
6. (1 mark) list the contents of **reserves_log** table

7. (1 mark) Update the **sailors** table **rating** from the file **update-sailors02.csv**
8. (1 mark) Update the **boats** table **bcolor** from the file **update-boats02.csv**
9. (1 mark) Update the first 100 entries of **reserves** table by incrementing the date by 1 day.
10. (1 mark) list the contents of **sailors_log** table
11. (1 mark) list the contents of **boats_log** table
12. (1 mark) list the contents of **reserves_log** table

13. (1 mark) Delete the records from the **sailors** table whose **sids** are given in **delete-sailors02.csv**
14. (1 mark) Delete the records from the **boats** table whose **bids** are given in **delete-boats02.csv**
15. (1 mark) Delete the first 100 records from the **reserves** table.

16. (1 mark) list the contents of **sailors_log** table
17. (1 mark) list the contents of **boats_log** table
18. (1 mark) list the contents of **reserves_log** table

Task 06 (10 marks) Multiple triggers

1. (5 marks) Create a trigger on **sailors** table say **sailor_t2**. Whenever a row is inserted into this table, and before the row is inserted this trigger should insert a record into **sailor_log** table with **sid** of the row about to be inserted, **event_ba="before"**, **ops="t2 insert"**. **sailor_t2** trigger should execute before **sailor_t1** trigger.
2. (5 marks) Create a trigger on **sailors** table say **sailor_t3**. Whenever a row is inserted into this table, and before the row is inserted this trigger should insert a record into **sailor_log** table with **sid** of the row about to be inserted, **event_ba="before"**, **ops="t3 insert"**. **sailor_t3** trigger should execute before **sailor_t1** trigger and after **sailor_t2**.

Task 07 (2 marks) populate data and show the log files

1. (1 mark) populate the **sailors** table from the file **sailors03.csv**
2. (1 mark) list the contents of **sailors_log** table

Task 08 (10 marks) Recursive triggers

1. (5 marks) Create a trigger on **sailors_log** table say **sailor_log_t1**. Whenever a row is inserted into this table, and after the row is inserted this trigger should insert a record into **sailor_log_log** table with appropriate entries into the log file.
2. (5 marks) Create a trigger on **sailors_log_log** table say **sailor_log_log_t1**. Whenever a row is inserted into this table, and after the row is inserted this trigger should insert a record into **sailor_log_log_log** table with appropriate entries into the log file.

Task 10 (4 marks) populate data and show the log files

1. (1 mark) populate the **sailors** table from the file **sailors04.csv**
2. (1 mark) list the contents of **sailors_log** table
3. (1 mark) list the contents of **sailors_log_log** table
4. (1 mark) list the contents of **sailors_log_log_log** table

Task 11 (5 marks) Declare the following

1. (5 marks) Create a trigger on **sailors_log_log_log** table say **sailor_log_log_log_t1**. Whenever a row is inserted into this table, and after the row is inserted this trigger should insert a record into **sailors** table with randomly generated entries.

Task 12 (4 marks) populate data and show the log files

1. (1 mark) populate the **sailors** table from the file **sailors05.csv**
2. (1 mark) list the contents of **sailors_log** table
3. (1 mark) list the contents of **sailors_log_log** table
4. (1 mark) list the contents of **sailors_log_log_log** table

Task 13 (6 marks) populate data and show the log files

1. (1 mark) insert 10 duplicate records into **sailors** table
2. (1 mark) insert 10 duplicate records into **boats** table
3. (1 mark) insert 10 duplicate records into **reserves** table
4. (1 marks) show the contents of **sailors_log**
5. (1 marks) show the contents of **boats_log**
6. (1 marks) show the contents of **reserves_log**