

CSCI 4125 Database Structures - Phase 2

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Due Oct. 22, 2025

I. SQL DDL

To maintain referential integrity, **Phase2_Task1_Schema.sql** drops these tables in order at the beginning of the script and inserts them in the reverse order:

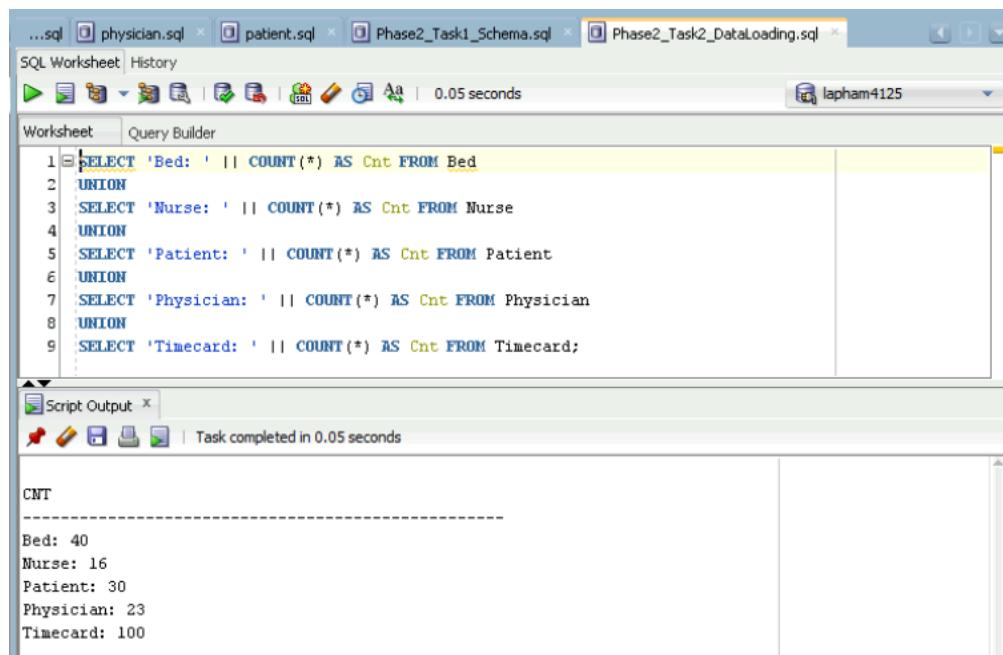
- Timecard
- Bed
- Nurse
- Patient
- Physician

II. Data Loading

Phase2_Task2.java reads text files of the tables specified in the command-line, maintaining domain integrity. The table data provided must be added in the reverse order above to maintain entity and referential integrity.

- **Usage:** javac Phase2_Task2.java && java Phase2_Task2 [tableName]

Phase2_Task2_DataLoading.sql verifies that the data was loaded correctly.



```
...sql physician.sql patient.sql Phase2_Task1_Schema.sql Phase2_Task2_DataLoading.sql
SQL Worksheet History
Worksheet Query Builder
1 SELECT 'Bed: ' || COUNT(*) AS Cnt FROM Bed
2 UNION
3 SELECT 'Nurse: ' || COUNT(*) AS Cnt FROM Nurse
4 UNION
5 SELECT 'Patient: ' || COUNT(*) AS Cnt FROM Patient
6 UNION
7 SELECT 'Physician: ' || COUNT(*) AS Cnt FROM Physician
8 UNION
9 SELECT 'Timecard: ' || COUNT(*) AS Cnt FROM Timecard;

Script Output
CNT
-----
Bed: 40
Nurse: 16
Patient: 30
Physician: 23
Timecard: 100
Task completed in 0.05 seconds
```

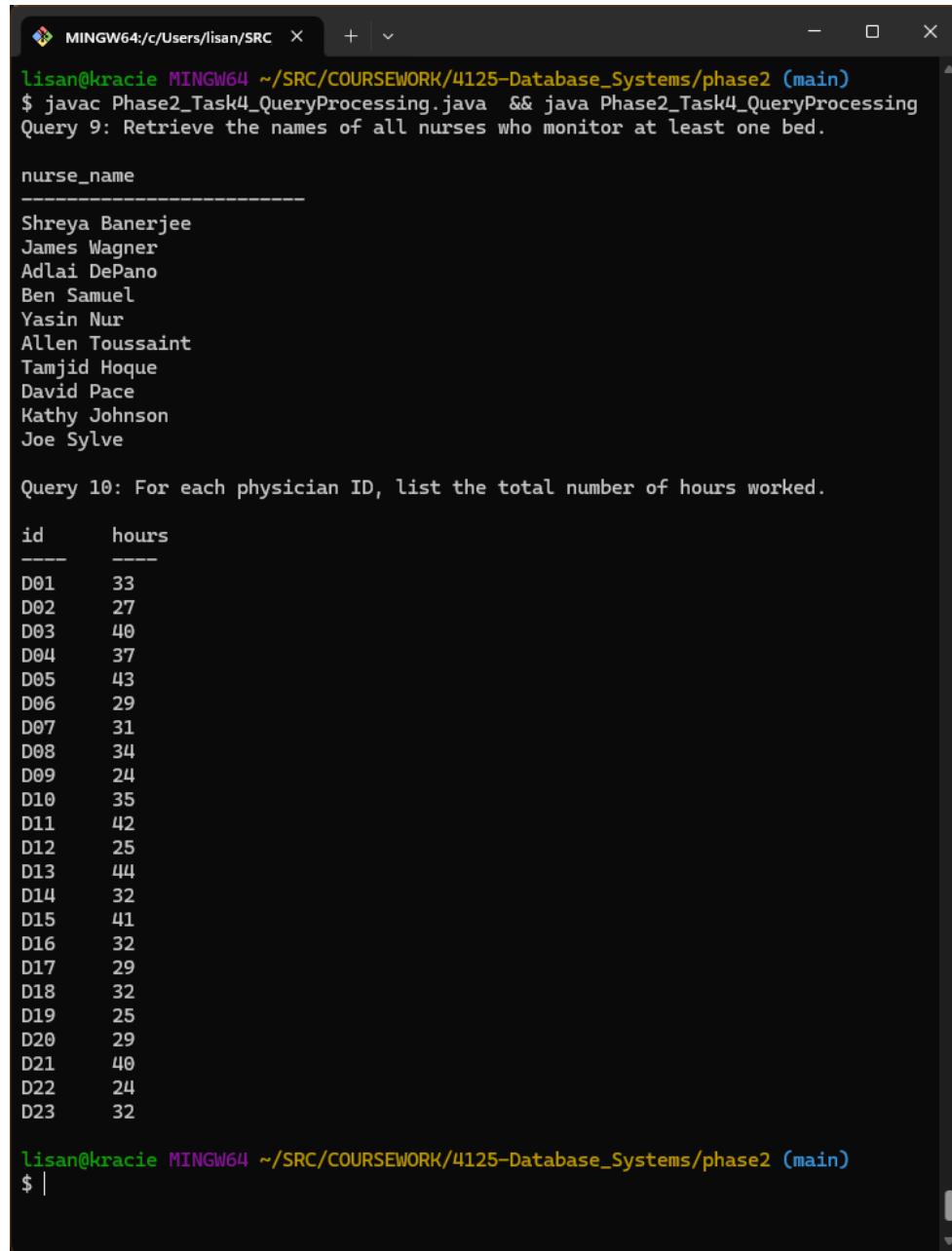
III. Retrieval Queries

Phase2_Task3_Questions.sql contains 19 SELECT queries using the data in the previous steps.

IV. Query Processing

Phase2_Task4.java is the flat file model implementation of two queries from Task 3:

- **Query 09:** Retrieve the names of all nurses who monitor at least one bed. Make sure to remove duplicates.
- **Query 10:** For each physician ID, list the total number of hours worked.



```
MINGW64:/c/Users/lisan/SRC ~
lisan@kracie MINGW64 ~/SRC/COURSEWORK/4125-Database_Systems/phase2 (main)
$ javac Phase2_Task4_QueryProcessing.java && java Phase2_Task4_QueryProcessing
Query 9: Retrieve the names of all nurses who monitor at least one bed.

nurse_name
-----
Shreya Banerjee
James Wagner
Adlai DePano
Ben Samuel
Yasin Nur
Allen Toussaint
Tamjid Hoque
David Pace
Kathy Johnson
Joe Sylve

Query 10: For each physician ID, list the total number of hours worked.

id      hours
----  -----
D01      33
D02      27
D03      40
D04      37
D05      43
D06      29
D07      31
D08      34
D09      24
D10      35
D11      42
D12      25
D13      44
D14      32
D15      41
D16      32
D17      29
D18      32
D19      25
D20      29
D21      40
D22      24
D23      32

lisan@kracie MINGW64 ~/SRC/COURSEWORK/4125-Database_Systems/phase2 (main)
$ |
```

V. Transaction Processing

Transactions:

- T1: R1(X), R1(Z), W1(X)
- T2: R2(Z), R2(Y), W2(Z), W2(Y)
- T3: R3(X), R3(Y), W3(Y)

Schedules:

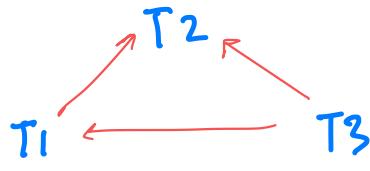
- S1: R1(X), R2(Z), R1(Z), R3(X), R3(Y), W1(X), W3(Y), R2(Y), W2(Z), W2(Y)
- S2: R1(X), R2(Z), R3(X), R1(Z), R2(Y), R3(Y), W1(X), W2(Z), W3(Y), W2(Y)

S1

T1	T2	T3
R(X)		
R(Z)	R(Z)	
W(X)		R(X)
	R(Y)	R(Y)
	W(Z)	
	W(Y)	

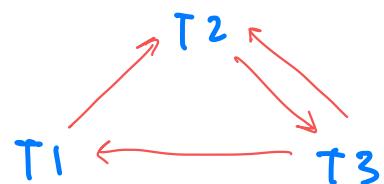
S2

T1	T2	T3
R(X)		
R(Z)	R(Z)	
W(X)		R(X)
	R(Y)	R(Y)
	W(Z)	
	W(Y)	



Serializable

$\langle T_3, T_1, T_2 \rangle$



not serializable

$\langle T_2, T_3 \rangle$ cycle

$\langle T_1, T_2, T_3 \rangle$ cycle