

# Homework Due 2021-11-16 by 22:55 New York Time

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## 1 General Instructions

1. You need to follow carefully the instructions for the assignment as written below.

It is advisable to print out this document and check off various points as they are addressed. It is easy to miss something when switching between the assignment and the solution on a single screen, especially on a laptop with a relatively small screen.

If you do not have access to a printer, at least review your solution before the submission to make sure that you did all that you were requested to do and only what you were requested to do.

2. If you want to refer to a specific line in this document, refer to the small numbers in the left margin.

3. If you have questions concerning this homework email Shubham Srivastava, <mailto:ss14687@nyu.edu>, *in the way specified in the course description*.

To be sure that you get an answer to your question before the submission deadline, *do not delay your question to the date on which the assignment is due*.

If you still have unresolved questions, email Zvi Kedem, <mailto:zk1@nyu.edu>, including all relevant correspondence with the assistant(s) listed above, *in the way specified in the course description*.

4. Submit your homework in an electronic form by uploading it to NYU Classes by the due date and time. Use only permitted software and format. E.g., if you are asked for a relational database specification using SQL Power Architect than that's what you must submit.

5. If you submit a scanned, handwritten assignment when permitted, it has to be written neatly, that is, it should be neatly divided into lines just as a typeset document, etc. You may submit a handwritten assignment only when that is explicitly allowed. And, unless stated otherwise, you must submit such a handwritten assignment as a file in PDF format only.

6. It is important that you follow the directions precisely. Also, please *check* that you submitted what you intended to submit, as you are responsible for making sure of that. The best way to do is to download what you submitted to check that.

And the best way to manage your work is to dedicate a folder/directory to each assignment.

7. Until the deadline that the system imposes you can resubmit your homework as many times as you like and you may want to submit it relatively frequently in case something happens to your partial work on your machine.

8. Do not email your submission to any of the assistants. If you did not submit your solution on time, please email Zvi Kedem, <mailto:zk1@nyu.edu>, *in the way specified in the course description* with an explanation of what has happened, and if you have a solution (possibly partial), email the solution also.

If you do need to submit the solution by email, and *only* if you need to submit by email because you are late or for other reasons, please follow the format as described next. Assuming that you are submitting your solution to Homework due 2034-02-15 and your Net ID is abc123, all the files of your homework should be

emailed as a zip file named 20340215abc123.zip. Of course you need to specify the correct date and the correct Net ID.

Do not communicate with any of the graders concerning a late submission.

9. Be sure to follow the academic integrity rules listed in the posted syllabus. The department, the GSAS, and NYU treat academic integrity very seriously and we are required to report all possible violations.
10. **Note:** Due to the unusual circumstances, we will be more able to extend deadlines, but generally only on a one-by-one case. All such requests need to be addressed to Zvi Kedem, <mailto:zk1@nyu.edu> *in the way specified in the course description*, with a reason for such a request.

## 2 Homework

Reminder: If you are not officially registered in the class and the class does not show on Albert for you, do not submit any assignments.

Please read and follow carefully the instructions in Section 1.

### 2.1 Description

This is the second of two assignments dealing with SQL. Both assignments use the same small database with very similar instances.

### 2.2 Assignments

1. (a) You are already supposed to know how to run SQL queries/commands on the Oracle systems at CIMS. You were asked to familiarize yourself with and follow the instructions in `How_To_Use_Oracle_At_CIMS.pdf`.

You were asked to do that earlier in order to save you time while working on this homework.

So it is assumed that you know how to do that.

- (b) Look at the files `ER07.drawio` and `relational07.architect`. They will help you understand the database schema defined in the files `script07.sql` and `dataSetupScript07.sql`. These files fully specify the application.

- (c) Read `script07.sql` and `dataSetupScript07.sql` carefully. They both define and create the sample database and `script07.sql` serves as the placeholder for putting in your solutions.

Look carefully over ANSWER0 there. It shows you how to insert a result of a query into an empty table. It also uses the temp table TEMP0, just to demonstrate the usage of temp tables.

- (d) Input your queries into `script07.sql` after doing what is requested in Item 1e of Section 2.2.

For each query, *unless something else is required by the query* make sure to

- i. Remove duplicates from the answer (unless requested otherwise); that's what `DISTINCT` does
- ii. Sort the result in ascending order (unless requested otherwise); that's what `ORDER BY` does

This is *extremely important* to make the grading more manageable.

So, for example, assuming that you are going to select `a` and `b` and rename `b` as `c`, you should actually *explicitly* use:

```
SELECT DISTINCT a, b AS c
...
ORDER BY a ASC, c ASC;
```

*Do not rely the on default removal of duplicates and sorting order.*

You may use temporary tables. If you choose to do that, use tables TEMP1, TEMP2, ..., TEMP20.

- (e) Replace “zk1” in `script07.sql` with your NetID.
- (f) Do not remove the existing sample query.

- (g) Notice that the `script07.sql` internally executes `dataSetupScript07.sql` followed by the queries you write in `script07.sql`, and produces a spool file `spool07.txt` that contains just the details of the queries specified in the script `script07.sql`. The spool should only contain the details while running `script07.sql` and not the data setup script. The spool file created will be a part of the submission.

Do not be concerned that there are more placeholder ANSWERS that the queries that you are supposed to produce.

For reference, `spool07.txt` corresponding to the given `script07.sql` (with one sample query) is enclosed.

**The requested queries are listed below. Your answers must work for every instance of the database and not only for the specific instance provided. Do not use subqueries to produce your output.** The tables are named AnswerX, where “X” stands for the item number below. So, as the first item is item number 1, the first table is Answer1.

1. Produce table AnswerX(RegNumber, TIN) that lists all the big companies that do not have a manager.
2. Produce table AnswerX(TIN, SalaryRatio) that lists the TIN of the big companies that spend more than 10 percent of their value on manager salary.
3. Produce table AnswerX(TIN) that lists the TIN of companies that work in at least 3 domains and have a TIN greater than or equal to 20000000.

Your answer should work if the question were phrased with 500 instead of 3 if you replace 3 by 500 in your answer.

4. Produce table AnswerX(TIN) that lists the companies that work at least in all the domains that company with TIN '99448276' works in.
5. Write and execute a query to delete from table Company the company with TIN '74939103'. Please do what's requested in Item 1h of Section 2.2.
6. Company '95499546' has hired a new manager with PersonalName 'Mickey', FamilyName 'Aldrin' with salary 100000. Write and execute a query to add/change the name of the store's manager in our records wherever necessary.

Please do what's requested in Item 1h of Section 2.2.

7. Company '35983220' has made huge mistakes in the recent past, and lost a lot of its value. As a result, they have to fire their current manager. They would now be a small company. Write and execute a query to remove the company from big companies, and make the company a small company.

Please do what's requested in Item 1h of Section 2.2.

8. Write and execute a query to create a record of company with TIN '74939103' helping company with TIN '90309251'.

Please do what's requested in Item 1h of Section 2.2.

9. MySQL does not have a very useful operator we studied: MINUS. Review the definition of MINUS from Unit 05.

Do not use MINUS for this question. Produce table AnswerX(A, B), which is R MINUS S. Use LEFT OUTER JOIN in your answer. Tables R and S are defined in the script.

- (h) Examine the database and fill out `text07.txt`. For each “AnswerX” (of course replacing “X” with the correct value), supply the information requested between the two square brackets, in [ ]. The form is clear but to elaborate it is asking you to specify which tables (if any) were changed and why. You may get an error message pertaining to this question. If you do get it,

- copy the error into `text07.txt`, and

- 129           • explain in *your own words what the error was*, and do not just copy the message that Oracle gave  
130           you, though you can also quote it. You may consult the Web, if you like.

131           If you do not get an error, state so.

### 132 **2.3 What to submit**

133 Please upload 3 files, named *exactly* as specified and in the format *exactly* as specified.

- 134       1. `script07.sql`, the script with your answers  
135       2. `spool07.txt`, the resulting spool file  
136       3. `text07.txt`, the file requested in Item 1h of Section 2.2