# CS-410/CS-510: High-stakes Writing Assignment
# Data-intensive Application Development

Your name goes here

## Contents

# 1 Data-intensive Application Selection

Describe the data-intensive application you have selected. What are its characteristics? What makes it data-intensive? Who is the sponsor of this project? Who are the end-users? How will they benefit from this application?

# 2 Identification and Documentation of Use-cases

How may user classes do you have? How many actors (including human, application, and abstract ones like time)? Name use-cases. Document them using the LaTeX template.

# 3 Use-case Diagram

Your use-case diagram goes here.

# 4 Identification and Documentation of Data Tasks in the Application

Your data task details go here.

# 5 Identification and Documentation of Transactions

Document your transactions here.

# 6 Identification and Documentation of Database Queries

Describe your database queries (in English, not in SQL) here.

# 7 Conceptual Data Model

Include your conceptual data model here

# 8 Logical Data Model

Describe your functional dependencies, normalization process, and final relational schema here.

# 9 Physical Data Model

Describe your physical database design here.

# 10 Database Creation and Data Loading

Include your database creation scripts here.

# 11 Implementing Database Transactions and Queries

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Your SQL for transactions and queries goes here.
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# 12 Developing Database Applications

Discuss the design and implementation details of the database application here. Please do not include actual code. You may include code in Appendix.

# 13 Summary of Revisions

Include information on: who critiqued your document, what suggestions were made, and how you incorporated the suggestions and revised the document.

# 14 Trunitin.com

Compile the LaTeX document and produce a PDF file. Submit the PDF file to turnitin.com. What does the results from turnitin.com say? What percentage of your document is similar to other documents? How do you defend if more than 15% of your document is similar to other documents?

# 15 Metacognitive Reflection

1. Did I solve the right problem?

   Your answer goes here.

2. Did I solve the problem right?

   Your answer goes here.

3. How did I approach solutions to the problems?

   Your answer goes here.

4. What strategies and techniques did I draw upon?

   Your answer goes here.

5. Did I learn a new strategy in completing this assignment? If so, how is it different from and similar to the repertoire of techniques that I have already acquired?

   Your answer goes here.

6. Any other information you may wish to add $\cdots$

   Your answer goes here.

# 16　Self-assessment

You need to assign a grade for this assignment yourself. Use the rubric listed below to come up with a score. The instructor will also assign a score. Without this section, assignment will be returned with a score of 0.

The first two traits correspond to writing and the remaining ones relate to domain aspects of the project.

| Perf Level / Trait | Poor | Fair | Good | Outstanding |
|---|---|---|---|---|
| *Diction* | Chooses non-technical vocabulary that inadequately conveys the intended meaning of the communication. | Chooses technical vocabulary that conveys the intended meaning of the communication. | Chooses appropriate, and varied vocabulary that conveys the intended meaning of the communication. | Chooses lively, precise, technical, and compelling vocabulary and skillfully communicates the message. |
| *Communication Style* | Has only a few (but noticeable) errors in style, mechanics, or other issues that might distract from the message. | Is virtually free of mechanical, stylistic or other issues. | Uses complex and varied sentence styles, concepts, or visual representations. | Creates a distinctive communication style by combining a variety of materials, ideas, or visual representations. |
| *Application Selection* | Not a data-intensive application. | Application is somewhat data-intensive | Application is data-intensive but limited access to domain expertise. | Application is data-intensive with adequate access to domain expertise. |
| *Use-cases* | Less than 50% of the use-cases are identified, and documented poorly. | Over 75% of the uses-cases are identified and documented using a standard template. | All the use-cases are identified, but detail is missing for some use-cases. | All the use-cases are identified, well-documented using a standard template, and verified against application requirements. |
| *Data Tasks* | Inputs, outputs, and possible error conditions are documented for less than 50% of data tasks. | Inputs, outputs, and possible error conditions are documented for less than 75% of data tasks. | Inputs, outputs, and possible error conditions are documented for all data tasks. | Inputs, outputs, and possible error conditions are documented for all data tasks. Processing logic (or high-level algorithms) for transforming inputs into outputs is also described. |
| *Transactions and Queries* | Less than 50% of the transactions and queries are identified and described. | Less than 75% of the transactions and queries are identified and described. | All the transactions and queries are identified and described. | All the transactions and queries are identified and described including their frequency of execution. |

| Perf Level / Trait | Poor | Fair | Good | Outstanding |
|---|---|---|---|---|
| *Data Models* | Only conceptual data model is described in detail. Cursory treat of logical data model. Physical data model design is missing. | Conceptual and logical data models are described in detail. Physical data model design is missing. | Conceptual, logical, and physical data models are described completely and precisely. | Conceptual, logical, and physical data models are described completely and precisely. Database normalization based on functional dependencies is discussed in detail. |
| *Creation and Loading* | SQL scripts are written and executed to create the database and load the data. Data in the database is trivial in size. | SQL scripts are written and executed to create the database and load the data. Data in the database is moderate in size. | Conceptual, logical, and physical data models are described completely and precisely. Data in the database is huge in size – in the order of millions of rows. | Conceptual, logical, and physical data models are described completely and precisely. Data in the database is huge in size – in the order of millions of rows. Detail evidence is provided on how referential integrity constraints are resolved. |
| *Implementing Transactions and Queries* | Less than 50% of the transactions and queries are implemented. | Less than 75% of the transactions and queries are implemented. | All the transactions and queries are implemented; run and execute correctly. | All the transactions and queries are implemented; run and execute correctly. There is also written evidence that transactions and queries are tested. |
| *Revisions* | Only peer or instructor feedback is solicited, but not incorporated. | Both peer and instructor feedback is solicited but not incorporated. | Both peer and instructor feedback is solicited and incorporated. | Both peer and instructor feedback solicited and incorporated. Evidence is presented to show how the feedback improved the document. |
| *Turnitin.com* | No submission is made to turnitin.com | Made to turnitin.com but results are not analyzed. | Made to turnitin.com and results are cursorily analyzed. | Made to turnitin.com and results are analyzed thoroughly. |
| *Meta-cognitive Reflection* | Not performed. | Is shallow and incomplete. | Is complete but not thorough. | Is complete and thorough. |

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Use the following table to score your solution. Circle the appropriate number in each row. For example, to circle 4, use the LaTeX markup code `\circled{4}`, which produces ④.

| *Perf Level*<br>*Trait* | *Poor* | *Fair* | *Good* | *Outstanding* |
|---|---|---|---|---|
| *Diction* | 2 | 3 | 4 | 5 |
| *Communication Style* | 2 | 3 | 4 | 5 |
| *Application Selection* | 4 | 6 | 8 | 10 |
| *Use-cases* | 4 | 6 | 8 | 10 |
| *Data Tasks* | 4 | 6 | 8 | 10 |
| *Transactions and Queries* | 4 | 6 | 8 | 10 |
| *Data Models* | 4 | 6 | 8 | 10 |
| *Creation and Loading* | 4 | 6 | 8 | 10 |
| *Implementing Transactions and Queries* | 4 | 6 | 8 | 10 |
| *Revisions* | 4 | 6 | 8 | 10 |
| *Turnitin.com* | 2 | 3 | 4 | 5 |
| *Meta-cognitive Reflection* | 2 | 3 | 4 | 5 |

Total score: xxx / 100.

# A    Code Listings

# B    Test Cases

# C    Other