COSC 4820 Database Systems

Spring 2015 Course Evaluation

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Catalog Description

COSC 4820. **Database Systems.** 3 CR. Provides comprehensive coverage of the problems involved in database design, in-depth coverage of data models and database languages. Students acquire practical skills of conceptual/logical database design and general familiarity with the problems and issues of database management.

Prerequisite: COSC 3020, Algorithms and Data Structures.

Course Topics

Textbook: *A First Course in Database Systems* by J. Ullman and J. Widom. Prentice Hall. 3rd Edition. 2007.

- The Relational Data Model
- Relational Design Theory and Normalization
- High-Level Database Models
- Relational Algebra
- SQL
- Constraints & Triggers
- Views & Indexes
- Accessing Databases from Java Programs
- Data Warehousing

Course Objectives

Students who complete this course should be able to perform the following tasks:

- Utilize database management systems that are used in industry and the computing profession.
- Express database queries in modern database languages such as SQL.
- Analyze, design, and implement database projects in accordance with industry standards (i.e. relational model, ER model, UML model, ODL model, SQL).
- Provide written, oral, and visual presentation of database projects.
- Perform basic database administration tasks.

Evaluation Summary

There were 24 students in this course.

15 of the 24 passed the course.

The table below shows the students' performance over time. Not reflected in the table is a steady improvement of the most important material, e.g., SQL.

Topic	Assessed	% Satisfactory
The Relational Data Model	1.4, 2.3, f.1b	61.7
Relational Design Theory and Normalization	1.5	50.0
High-Level Database Models	1.3, f.1a	77.5
Relational Algebra	1.1, 1.2, f.2a, f.2b	81.2
SQL	1.4, 2.1, 2.2, 2.3, f.2c, f.2d	65.0
Constraints & Triggers	2.3, 2.4	40.0
Views & Indexes	2.5, 2.6, f.5	50.0
Accessing Databases from Java Programs	f.3, f.4	62.5
Data Warehousing	f.6	20.0

Action Items

1. Students struggle with conversion from high-level database models to SQL, and they also struggle with relational design theory. But they do well with relational algebra and SQL.

We should leverage their comfort level with OOP concepts by introducing Hibernate early and using it to connect the high-level E/R diagrams with lower-level OOP classes, as a step towards very-low-level tables.

2. Few students are engaging with the advanced/optional material at the end of the course, e.g., Data Warehousing. This is partly due to the nature of the last week of the semester.

We should remove this material from the course altogether, and use the last week of the semester to better prepare students for the final.
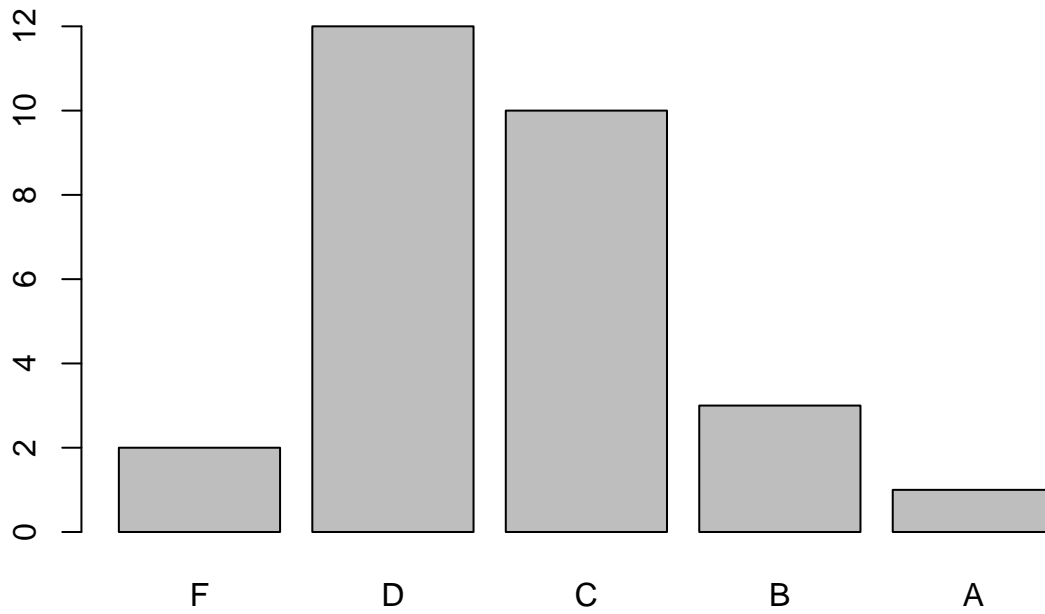

Appendix: Exam #1 Results

Exam Questions

Question	Points	Topic
q1	15	Relational Algebra, Read
q2	15	Relational Algebra, Write
q3	20	E/R Diagram Design
q4	20	ERD to SQL DDL
q5	30	Normalization
bonus	5	Attend Meeting

Grade Distribution

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##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##     58.00   63.50   69.50   70.79   75.00   90.00
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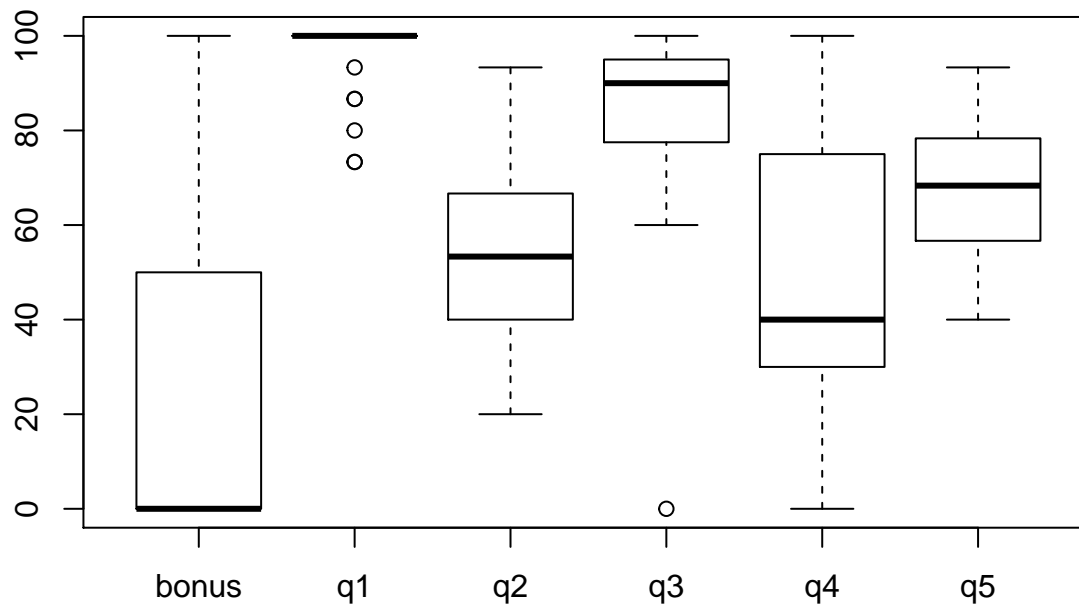
Exam 1 Results

Grade Distribution by Question

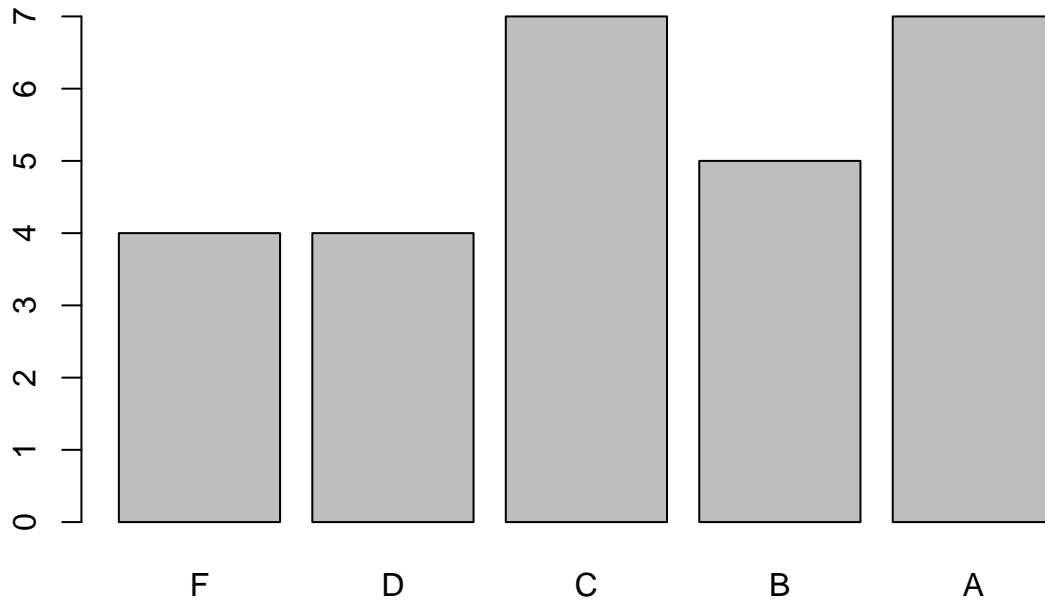## Individual Question Results

Appendix: Exam #2 Results

Exam Questions

Question	Points	Topic
q1	20	SQL, Read
q2	25	SQL, Write
q3	15	SQL DDL Constraints
q4	15	Triggers
q5	15	Views
q6	15	Index Selection and Creation

Grade Distribution
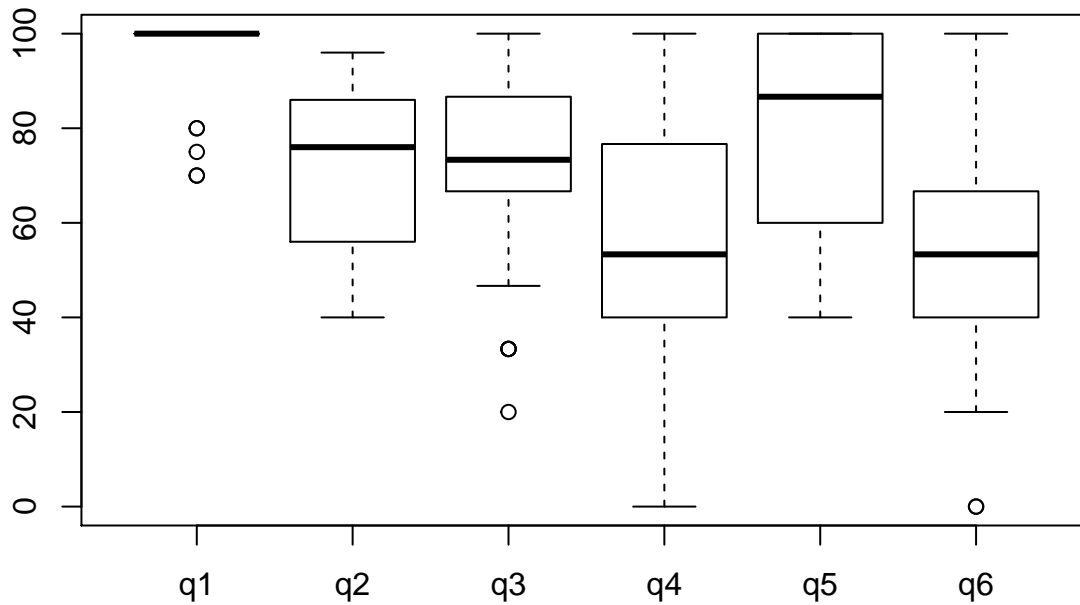
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##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   44.00   66.50   76.00   75.78   88.50   99.00
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Exam 2 Results

Grade Distribution by Question
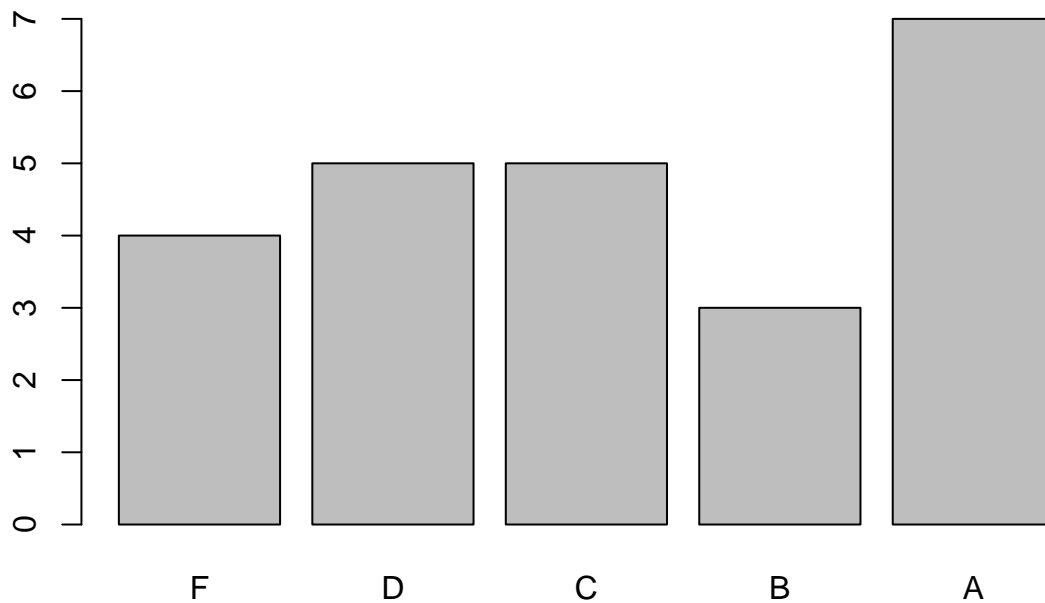
Individual Question Results

Appendix: Final Exam Results

Exam Questions

Question	Points	Topic
q1a	10	E/R Diagram Design
q1b	10	SQL DDL
q2a	6	Relational Algebra, Read
q2b	6	Relational Algebra, Write
q2c	10	SQL, Read
q2d	10	SQL, Write
q3	15	Programming, SQL Injection
q4	15	Programming, Closing Resources
q5	8	Types of Indexes
q6	10	Data Warehousing Basics
bonus	10	NoSQL Design

Grade Distribution

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##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   44.00   64.75   75.50   77.04   91.25  105.00
```

Final Exam Results

Grade Distribution by Question

Individual Question Results