CS5226 Lecture 0
Course Admin

CS5226: Database Tuning

- Lectures: Monday, 6:30 - 8:30pm, LT 19 (COM2)
- Lecturer: Chan Chee Yong
  - Office: #03-24, COM1 Building
  - Email: chancy@comp.nus.edu.sg
  - Phone: 6516-6736
  - Office hours: TBA or by email appointments
- Teaching Assistant:
  - Goh Wei Xiang (g0801429@nus.edu.sg)
- Course Information:
  - IVLE: download course material, forum discussions, annoucements

Course Objectives

- Understanding of database architecture & performance tuning
- Hands-on experience in database system tuning

Prerequisites

- **CS2102 (Database Systems)**
  - Relational data model & algebra
  - SQL
  - Schema design: dependency theory, normal forms
- **CS3223 (Database Systems Implementation)**
  - Storage & indexing techniques
  - Query optimization & evaluation
  - Transaction management: concurrency control & data recovery

CS2102 & CS3223 Reference Books

- Raghu Ramakrishnan & Johannes Gehrke,
  Database Management Systems,
  McGraw-Hill, Third Edition, 2003.
  (QA76.9 Dbm.Ra 2003)
- Avi Silberschatz, Hank Korth & S. Sudarshan,
  Database Systems Concepts,
  McGraw-Hill, Sixth Edition, 2011.
  (QA76.9 Dbm.Si 2011)
- Hector Garcia-Molina, Jeffrey Ullman, & Jennifer Widom,
  Database Systems: The Complete Book,
  Prentice Hall, Second Edition, 2009.
  (QA76.9 Dbm.Gar 2009)

CS5226 Course Material

Research & Industrial Papers

- Will be made available at IVLE

Reference Books

- Nicolas Bruno,
  Automated Physical Database Design and Tuning,
  CRC Press, 2011. (QA76.9 Dat.Bn 2011)
- Sam Lightstone, Toby Teorey, & Tom Nadeau,
  Physical Database Design: the Database Professional's Guide to Exploiting Indexes, Views, Storage, and More,
  Morgan Kaufmann, 2007. (QA76.9 Dat.Li 2007)
- Dennis Shasha & Philippe Bonnet,
  Database Tuning: Principles, Experiments, and Troubleshooting Techniques, Morgan Kaufmann, 2002. (QA76.9 Dbm.Sh 2002)

Tuning guides for DBMS products

- IBM DB2 Performance Tuning
- Microsoft SQL Server Performance (Database Engine)
- Oracle Database Performance Tuning Guide
- PostgreSQL Performance Optimization
- Sybase Performance and Tuning Guide

Workload & Assessment

- Number of credits = 4
- Workload per week = 9 hours
  - 2 lecture hours
  - 3 assignment hours
  - 4 preparatory work hours
- Tentative Module Assessment:

Assessment Component	**%**
Lab Assignments	15
Project	30
Open-book Midterm Exam	15
Open-book Exam	40

- Policies:
  - Zero-tolerance for plagiarism

    `http://emodule.nus.edu.sg/ac/launch.htm`

Lab Assignments & Project

Lab Assignments

- Using Oracle 10g on Solaris server

Project

- Team-based programming project - team size to be decided in next lecture

Tentative Schedule

Week	Date	Topic
1	Jan 14	Introduction
2	Jan 21	Query Tuning I
3	Jan 28	Query Tuning II
4	Feb 4	Index Tuning
5	Feb 11	Public Holiday
6	Feb 18	Materialized View Tuning
-	Feb 25	Recess Week
7	Mar 4	Midterm Test
8	Mar 11	Transaction Tuning I
9	Mar 18	Transaction Tuning II
10	Mar 25	Data Partitioning
11	Apr 1	Statistics Tuning
12	Apr 8	Memory Tuning
13	Apr 15	Wrap up & Review
14	Apr 22	Reading Week
15	Apr 27 (Saturday)	Final Exam