



Big Data System Design

Lecture 1: Course Overview

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Agenda Layout

01

Course Instructors

02

Course Objectives and Features

03

Course Schedule and Evaluation

04

Project and Policies

Course Instructors



김정훈

Researcher & Lecturer/PhD
(etyanue@chungbuk.ac.kr)

Office: S4-1, 304
Tue. 13:00 – 17:00



Open Chat

Link available on
CBNU Blackboard

Office: Kakao
Tue 13:00 – 17:00

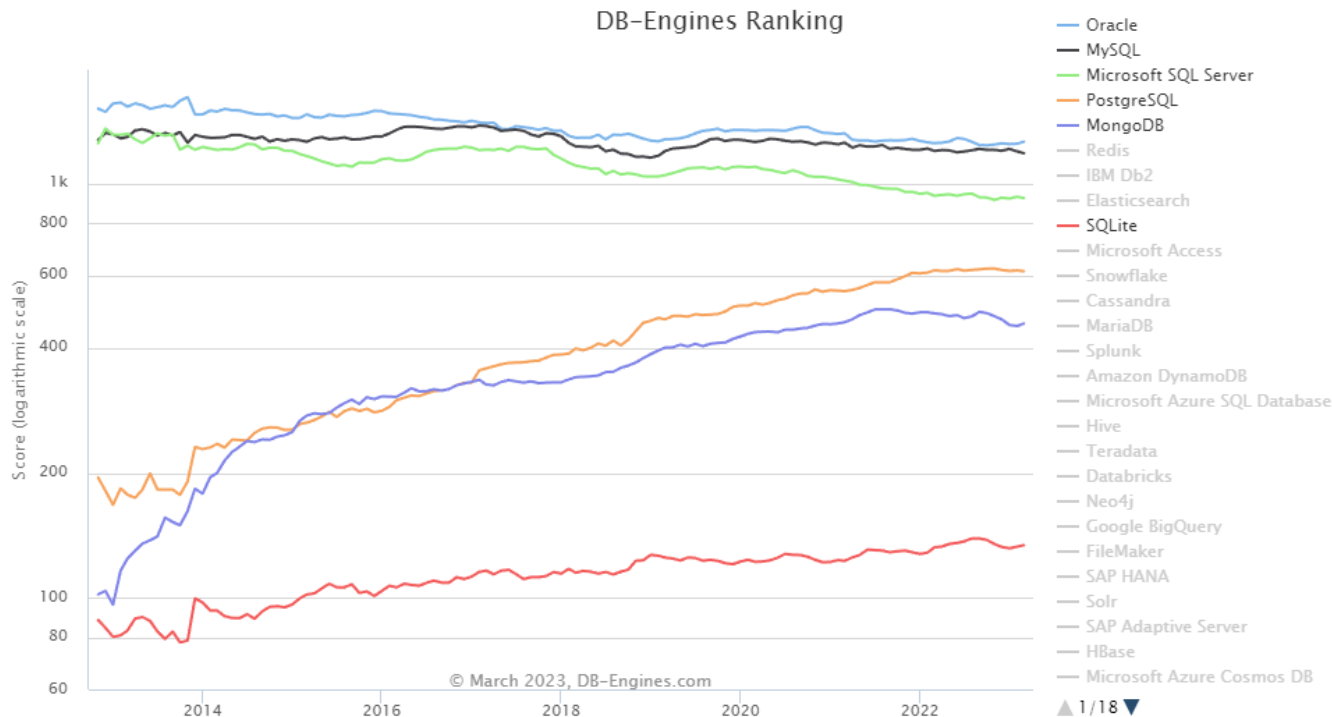
Do you still use Relational DBMS?

410 systems in ranking, March 2023

Rank			DBMS	Database Model	Score		
Mar 2023	Feb 2023	Mar 2022			Mar 2023	Feb 2023	Mar 2022
1.	1.	1.	Oracle +	Relational, Multi-model i	1261.29	+13.77	+9.97
2.	2.	2.	MySQL +	Relational, Multi-model i	1182.79	-12.66	-15.45
3.	3.	3.	Microsoft SQL Server +	Relational, Multi-model i	922.01	-7.08	-11.77
4.	4.	4.	PostgreSQL +	Relational, Multi-model i	613.83	-2.67	-3.10
5.	5.	5.	MongoDB +	Document, Multi-model i	458.78	+6.02	-26.88
6.	6.	6.	Redis +	Key-value, Multi-model i	172.45	-1.39	-4.31
7.	7.	7.	IBM Db2	Relational, Multi-model i	142.92	-0.04	-19.22
8.	8.	8.	Elasticsearch	Search engine, Multi-model i	139.07	+0.47	-20.88
9.	9.	↑ 10.	SQLite +	Relational	133.82	+1.15	+1.64
10.	10.	↓ 9.	Microsoft Access	Relational	132.06	+1.03	-3.37

Source: <https://db-engines.com/en/ranking>

Do you still use Relational DBMS?



Source: <https://db-engines.com/en/ranking>

Course Objectives

Objective 1

NoSQL

Understand how NoSQL databases can provide flexibility and scalability in handling a large amount of data

Objective 2

MongoDB

Know how to store and retrieve data from a database using MongoDB query and aggregation frameworks

Objective 3

MongoDB Tools

Compass and MongoDB Management Studio, PyCharm, Jupyter Notebook

Objective 4

Big Data Management

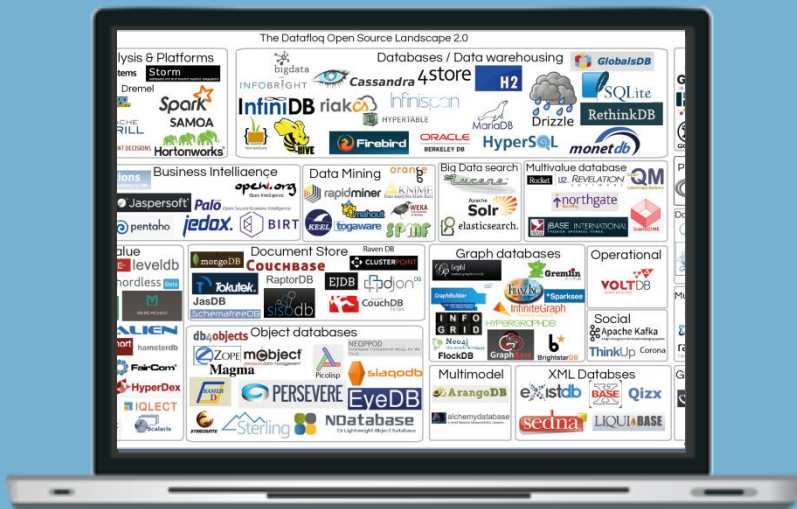
Manage big data efficiently using various tools, such as replication and sharding

Objective 5

Implementation Experience

Develop big data-driven applications using Python

Course Features



Big Data

Learning about Big Data and NoSQL database



Practice

Practice developing Big Data applications using MongoDB



Project

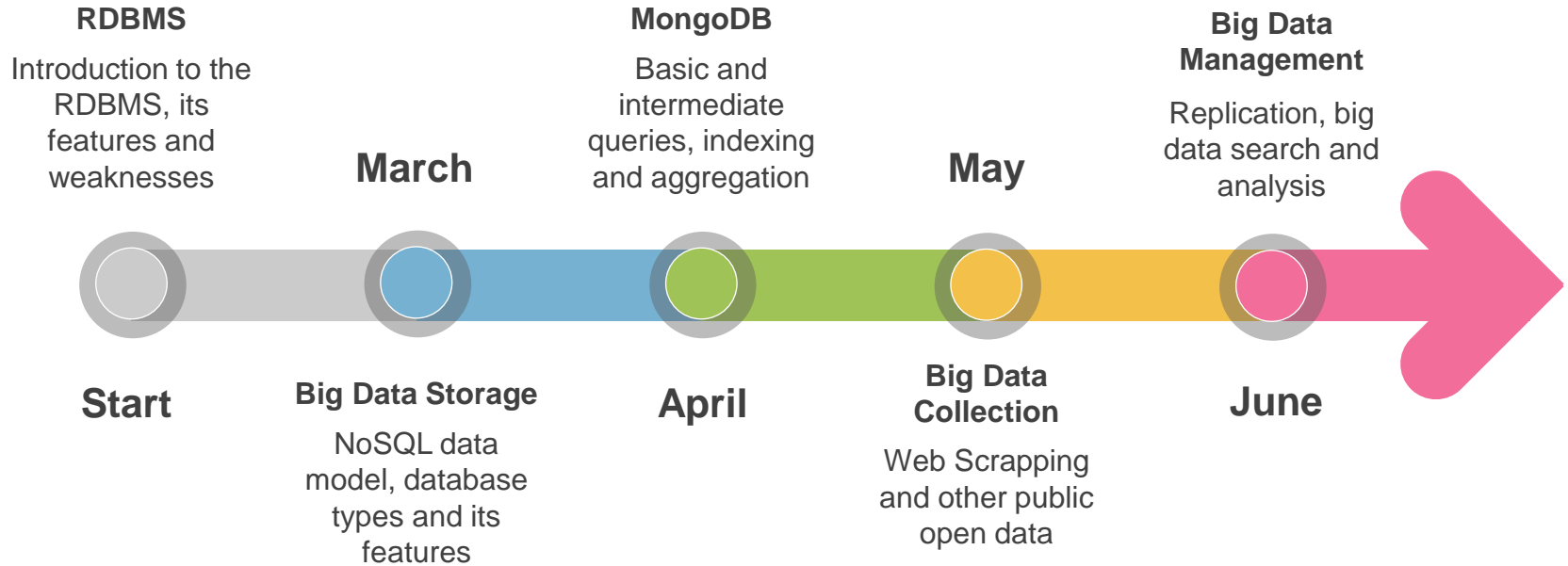
Real-world applications using Big Data



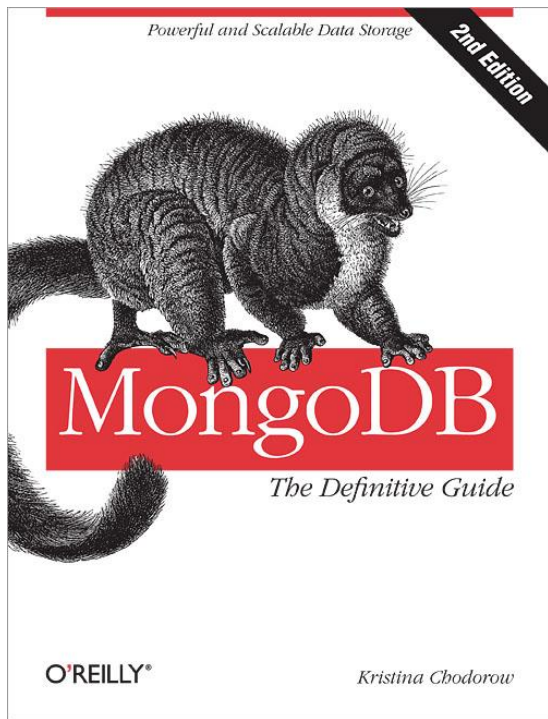
Future

Use-cases and Prospects of Big Data

Monthly Schedule



*Note that the course schedule may change depending on students' understanding



Seven Databases in Seven Weeks

A Guide to Modern Databases
and the NoSQL Movement

Eric Redmond
and Jim R. Wilson

Series editor: Bruce A. Tate
Development editor: Jacquelyn Carter



Textbook and References

PPT Slides from Course

Jeong-Hun Kim, CBNU,
2024

01

**MongoDB: The
Definitive Guide**

Kristina Chodorow, Oreilly
2013

02

**Seven Databases in
Seven Weeks**

Erid Redmond, The
progmatic Bookshelf, 2012

03

Course Evaluation



30%

Mid-Term Examination

Mid semester and related to RDBMS, NoSQL and MongoDB, querying

30%

Project Presentation

A semester-long team project with three members. Should develop a big data driven application

30%

Homework

Weekly tasks that will be used to check your progress

10%

Attitude

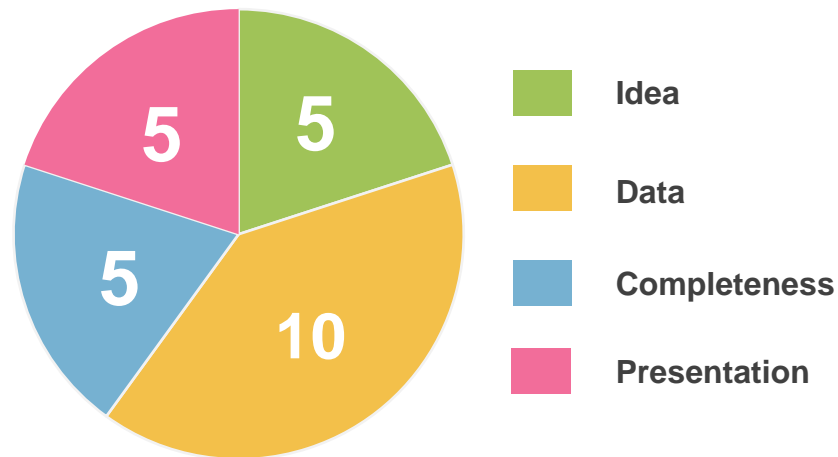
Late submission of homework, being late for the lectures

Project Evaluation

No	Requirements	Done
1	Choose publicly available data (JSON). <ul style="list-style-type: none">- Note that your data must have a large size- You can also use the dataset from your own project	<input checked="" type="checkbox"/>
2	Store the data in MongoDB	<input checked="" type="checkbox"/>
3	Create queries (at least 8)	<input checked="" type="checkbox"/>
4	Visualize your data	<input checked="" type="checkbox"/>
5	Perform optimization <ul style="list-style-type: none">- indexing, replication, sharding	<input checked="" type="checkbox"/>
6	Make project presentation	<input checked="" type="checkbox"/>

Project Details

For this course, there is a semester-long team project (3 members) that involves creating a database-driven application using MongoDB.



Course Policies

Lecture Style

Lecture 50% and practice 50%

Lecture Notes

Lecture notes will be available via CBNU Blackboard 10 minutes before the lecture

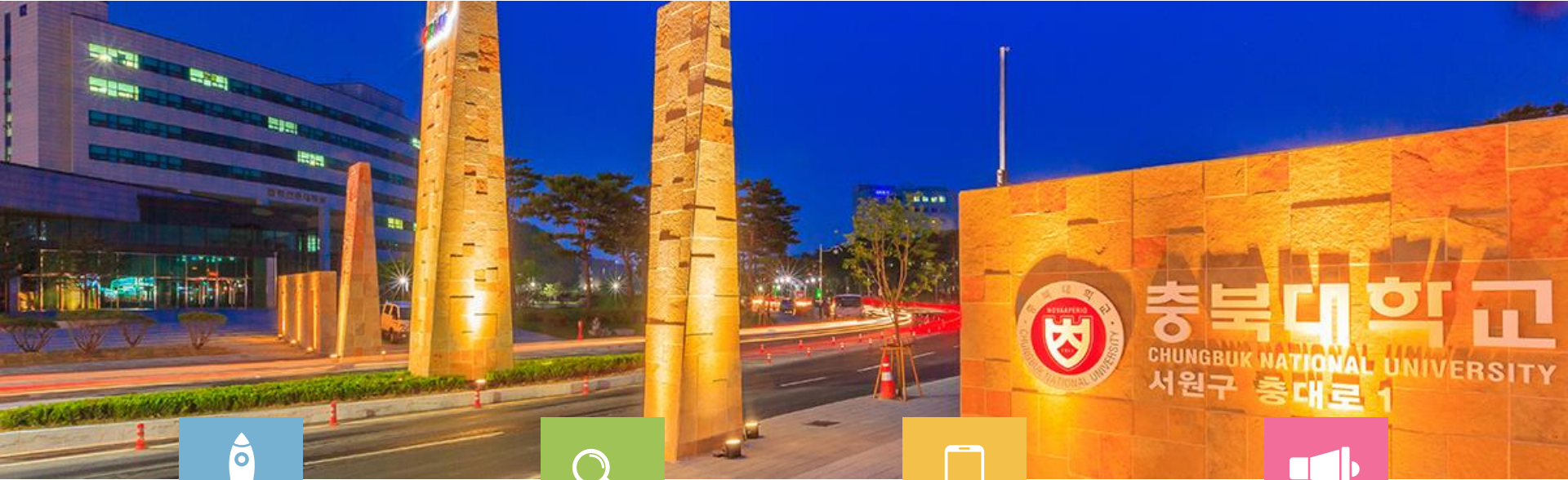
Homework

The homework will be announced via CBNU Blackboard after practice

Examination

Cheating students will receive the disciplinary actions (F grade).





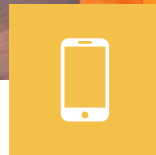
Department Rules

Read the rules carefully
and make sure you follow
the instructions



Prevention

Wear mask, no food or
drinks, maintain social
distance, record your
health status



COVID-19 Attendance

Stay home if you feel sick
(**Only two times per
semester**). Still have to do
the homework



No Cheating

Violation of these rules
may negatively impact
scholarship and other
benefits



Questions?

See you next time!