No SQL Databases[IT413]

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Course Content

- No SQL databases - Introduction and Motivation.
- Types of No SQL Databases.
- For each type of No SQL database, we attempt getting insight into following

  Part-I
  - Understand **Data Model**
  - **Programming Abstraction** it provides (ie how do we manipulate databases)
  - **Database Implementation**

  Part-II
  - Various techniques/algorithms used in Implementation of Systems based on the data model
  - How a system implementation provide and implements
    - Storage Structure, Data Distribution (Sharding), Replication, Consistency, Transaction Support, etc.

Course Content

- Approaches and Data Models that we will cover-
  - Map Reduce framework. Querying raw data without Schema (Hive/Spark-SQL)
  - Key value databases
  - Document Databases
  - Column Oriented databases
  - Graph Databases

Pedagogy

- We shall begin with basic concepts of No SQL databases.
- Then, we shall cover **Part-I** and bring in said details of various No SQL data models.
- Then **Part-II**. However we may not be cover or get required depth in many things.
- Students are expected to **select some topic** from Part-II and get dive into that. This study should result to a **term paper**.
- I would like to Explore concepts of "**Peer Leaders**" for conducting Labs.

Evaluation

Class Quizzes	20%
Term Paper or Project	40%
Home Assignments	20%
Lab Assignments	20%
End Semester* (we may have if some of evaluations do not work as expected)	0-20%

Class Quizes

- From next week onwards, we will start taking quizzes
- Number of question in a quiz will be about two (at max three)
- Scope of questions shall be previous 2 lectures.
- Each question shall carry one mark
- All put together will add up to your final score!

Term Papers or Project

- Objective: to get more detailed insight in a technology, technique, relevant problem and its solution, and PRESENT to the class
- Can be
  - Select a topic that is either a fundamental in implementing “No SQL Systems” or a related research problem
  - At least one good research paper is required related
  - Topic space: No SQL Database Design, Design Patters, Data Storage and Indexing, Sharding and Replication, Consistency, Performance, etc.
  - No SQL Database Design and Programming project. For Project also, you will have to submit a report.
- There may be mid term presentation of your “term paper or project”!

Peer Leaders

- A number of students act as peer leader
- A bunch of students, typically 9-10 are aligned with a peer leader
- Primarily responsibility of peer leaders is to help in conducting labs. Peer leaders take lead in doing lab; solve it before the lab starts
- Peer leaders are expected to attend lectures regularly and act as bridge between instructor and peer students
- Give honest feedback about course proceedings
- Self nominations will be invited shortly. If response is large some shortlisting will be done!

Texts

1. Sadalage, Pramod J., and Martin Fowler. *NoSQL distilled: a brief guide to the emerging world of polyglot persistence*. Pearson Education, 2013.
2. Sullivan, Dan. *NoSQL for mere mortals*. Addison-Wesley Professional, 2015.
3. Perkins, Luc, Eric Redmond, and Jim Wilson. *Seven databases in seven weeks: a guide to modern databases and the NoSQL movement*. Pragmatic Bookshelf, 2018.
4. Harrison, Guy. *Next Generation Databases: NoSQLand Big Data*. Apress, 2015.

- Course Home Page: https://moodle.daiict.ac.in/course/view.php?id=71

  Self register here

- Drive to dump some stuff https://drive.google.com/drive/folders/1PamlwMeAId9twhran20NP0ARVKXCWLHG

Best of Luck!