IT615 (Autumn ’2021)

Database Management Systems

pm_jat @ daiict

IT615
Database Management Systems

- Instructor

  PM Jat

  2203, Faculty Block 2

  #79 68261 641

IT615
Database Management Systems

- What is Database ?
- What is Database Management System ?
- What do we learn in this course ?

IT615
Database Management Systems

- What is Database ?
  - **Database is simply a collection of data** that are required, generated, and consumed by an “application”
  - What is an “application” – a collection of computer program for specific set of computing needs
- What is Database Management System ?
  - Database Management System is a **collection of programs for manipulating and managing databases**
  - Takes care of: Authorized Access, Concurrent Access
- What do we learn in this course ?

IT615, Database Management Systems

What do we learn in this course ?

- **Database representation techniques**. Representation happens at two level
  - At logical level – how programmers look at the database
  - At physical level – are data re actually on storage disks
- **Database Design and Implementation**: what is most optimal representation at logical level and physical level
- Perform **operations on databases using DBMS**: Add more data, modify existing data, answer user queries, so forth
- Learn read/write databases from DBMS interface as well as from a computer program
- Concerns and Solution for **concurrent access of database** by multiple users

Database Management Systems

- Lecture Schedule:
  - Tuesday: 8:30 to 9:45AM
  - Friday: 10:15 to 11:30AM

- Lab: Wednesday: 2-4pm

- Mode: Online!
  For every session, meet link shall be shared 10 minutes before the scheduled time!

Course Delivery

- Course Website: https://moodle.daiict.ac.in/course/view.php?id=95
- You shall require self registering for this course through the above link
- All Handouts, Lab exercises, Recorded lessons will be available through this.
- You should be able to see your marks for various labs and assignments right here.

Learning Objectives

- Database and DBMS concepts
- **Relational Theory**
- **Querying** Relational Database using Relational Algebra and SQL
- **Design** and Implement Relational Databases at logical level
- **Database Programming**: Creating Triggers and Stored Procedures, API based database access
- Databases Indexes
- Appreciate how SQL queries are executed in a typical RDBMS
- Appreciate issues related to concurrent transaction processing

Texts

- Not any specific. My notes, though bit concise, should be able to take care.
- You can however refer any of following standard texts-
  - **Database Systems: The Complete Book** by Hector Garcia-Molina, Jeffery Ullman, and Janiffer Widom, Pearson Education
  - **Fundamentals of Database Systems** by Ramez Elmasri and Shamkant B. Navathe, Pearson Education
  - **Database System Concepts** by Avi Silberschatz, Henry F. Korth, S. Sudarshan, Tata McGraw-Hill
  - **Database Management Systems** by Raghu Ramakrishnan and Johannes Gehrke, Tata McGraw-Hill

Evaluation for Grade

- Evaluation Strategy:
  - **Exams, lab, and projects that measures how good you have learned the required concepts, and learned to apply the concepts in real cases.**
- Marks Distribution
  - Class Quizzes and Mid Semester Exam: 30%
    - Class Quizzes: 20%
    - Mid Semester Exam: 10%
  - Lab Assessment (Ongoing): 20%
  - Database Project: 30%
  - End Semester Exam: 20%

Quizzes

- Almost in every lecture we shall have quiz
  - About 5 minute duration, and
  - Carrying 1-2 marks
  - Scope: from previous two lectures

- You should be:
  - Regular, Attentive, and Interactive

Lab Environment

- RDBMS Server: **PostgreSQL**
- Your Client: **pgAdmon4**

- Your should be able to access my server from the campus but require installing **pgAdmin4** on your computers!

- Why PostgreSQL:
  - Let us go with quote from their website:
    “The World's Most Advanced Open Source Relational Database”

Tentative Lab Plan

- Lab Exercises
  - Practice Relational Algebra and SQL – 4 weeks
  - Entity Relationship Diagrams – 2 weeks
  - Normalization – 1 week
  - Stored Procedure - 1 week
  - Database Programming – 1 week
  - Transaction Processing – 1 week

Lab Submission

- Every Labs will be evaluated on regular basis
  - Try submit Lab by due date and time.
  - Late submissions are allowed, though however your grade is affected by late submission.
  - Submissions late more than 24 hours shall not graded and will get zero marks.
  - Lab should be available to you in a week's time of submission at course website.

Database Projects

- Projects are done in a group of 3 to 4
- Here you are expected do following
  - Take a real life problem
  - Design Database and implement it on PostgreSQL
- Project start time: 4th week onwards
- Deliverables and submissions:
  - Its not that project submission is at the end of the semester. You shall be given project milestones, and each milestone shall have a submission

- Good Luck
- See you on 17th at 8:30AM