Welcome to

Database Development and Administration Workshop

Computer Science Outreach

SESSION PLAN

Session 1 : 10.00 AM – 11.20 AM
Break : 11.20 AM – 11.30 AM
Session 2 : 11.30 AM – 12.30 PM
Lunch : 12.30 PM – 01.15 PM
Session 3 : 01.15 PM – 03.00 PM
Break : 03.00 PM – 03.15 PM
Session 4 : 03.15 PM – 05.00 PM

SESSION DYNAMICS

Session 1: **– Intro to MySQL and SQL, Keys, Queries**

Session 2: **– Joins, Views, Triggers**

Session 3: **– Functions, Procedures, Events**

Session 4: **– MySQL Administration**

Getting Started

MySQL Community Server 5.5.x and MySQL Workbench
http://dev.mysql.com/downloads/

MySQL Installation Guide for Windows
http://dev.mysql.com/doc/refman/5.5/en/mysql-installer-gui.html

MySQL Reference Manual
http://dev.mysql.com/doc/refman/5.5/en/index.html

Get Presentation/Scripts from
http://bit.ly/1aLq3NA

1. What is RDBMS, MySQL and SQL
2. What is Schema; DDL, DML and DCL
3. Common Query Techniques
4. Keys, Constraints and Relationships
5. Joins and Views
6. Triggers
7. Functions
8. Stored Procedures and Events
9. Administration: User Access Control & Privileges
10. Administration: Backup/Restore & Optimization

What is RDBMS, MySQL and SQL Essentials …

- Relational Database Management System is a database management system that is based on the relational model

- RDBMS store the data into collection of tables, which might be related by common fields (database table columns) and fetch common data

- SQL is a standard query language used to communicate with the database

- MySQL is the world’s most popular open source database, with over 100 million copies of its software distributed

- Google, Yahoo, Adobe, YouTube, Wikipedia, Booking.com, Banking sectors

Database, Tables, Columns and Rows

MySQL Data types, DDL, DML and DCL

- A schema is a set of interrelated database objects such as tables, table columns, data types of the columns, indexes, foreign keys, and so on

- In MySQL, physically, a **schema** is synonymous with a **database**

MySQL Workbench >> user root >> open connection >> localhost:3306

```
CREATE DATABASE firstdb;
```

```
USE firstdb;
```

- ```
  CREATE TABLE `employee` (`Employee_ID` INT(10) NOT NULL,
  `First_Name` VARCHAR2(45) NOT NULL,
  `Last_Name` VARCHAR2(45) NOT NULL,
  `Title` varchar(30) NOT NULL, `stamp` TIMESTAMP NULL,
  PRIMARY KEY (`Employee_ID`))
  ENGINE=InnoDB DEFAULT CHARSET=utf8
  ```
  ```

Data Types

- CHAR(20) Holds a fixed length string (can contain letters, numbers, and special characters). Can store up to 255 characters
- VARCHAR(200) Holds a variable length string The length can be a value from 0 to 255 before MySQL 5.0.3, and 0 to 65,535 in 5.0.3 later
- TEXT Holds a string with a maximum length of 65,535 characters
- BLOB For BLOBs (Binary Large Objects). Holds up to 65,535 bytes of data
- DATE holds date in default format ‘2013-10-26’
- TIMESTAMP used to represent both date and time as ‘2013-10-26 11:00:00’
- INTEGER(4B), BIGINT(8B), FLOAT(4B), DOUBLE(8B)

- **Data Definition Language** (DDL) statements are used to define the database structure or schema. Some examples:

- CREATE - to create objects in the database

- ALTER - alters the structure of the database

- DROP - delete objects from the database

- TRUNCATE - remove all records from a table, including all spaces allocated for the records are removed

- **Data Manipulation Language** (DML) statements are used for managing data within schema objects. Some examples:

- SELECT - retrieve data from the a database

- INSERT - insert data into a table

- UPDATE - updates existing data within a table

- DELETE - deletes all records from a table, the space for the records remain

Data Control Language (DCL) statements. Some examples:

- GRANT - gives user's access privileges to database
- REVOKE - withdraw access privileges given with the GRANT command

Transaction Control (TCL) statements are used to manage the changes made by DML statements. It allows statements to be grouped together into logical transactions.

- COMMIT - save work done
- SAVEPOINT - identify a point in a transaction to which you can later roll back
- ROLLBACK - restore database to original since the last COMMIT

Common Query Techniques

- WHERE [<,>,=,IN]
- ORDER BY [DESC]
- GROUP BY [HAVING]
- SUBQUERIES
- JOINS

Keys

- A Candidate key of a table is a column OR a group of columns which uniquely identifies a row
- One of the candidate key is picked as Primary Key
- A Foreign key is a common key column used to match records from two tables. The foreign key forms a candidate key in one of the tables

Joins

- A natural join (**INNER JOIN**) of tableA and tableB fetches all records that match from two tables on a common foreign key

- SELECT A.id, A.age, B.type FROM TableA A, TableB B WHERE A.id = B.id

- **LEFT OUTER JOIN**

  - Return rows from left table even though they do not match with right

*SELECT * FROM table1 INNER JOIN table2 ON table1.id=table2.id;RIGHT*

RIGHT OUTER JOIN

Views

- CREATE VIEW FIRST_VIEW AS

  SELECT * FROM EMPLOYEE;

TRIGGERS

```
DELIMITER $$

CREATE TRIGGER `update_trigger` AFTER UPDATE ON `employee` FOR
EACH ROW BEGIN

UPDATE emp_change set emp.tid = new.tid;
```

Thank You !!!

Questions ???

Feedback: bit.ly/cwsfeed