**Department of Computer Science and Engineering**

| **Course Code: CSE 370** | **Credits: 3.0** |
| --- | --- |
| **Course Name: Database Systems** | **Semester: Fall 2024** |

**Lab 02: SQL Subqueries & Aggregate Functions  
Activity List**

* **All commands are shown in the red boxes.**
* **In the green box, write the appropriate query/answer.**
* **All new queries should be typed in the command window after mysql>**
* **Start by connecting to the server using: mysql -u root -p [password: <just press enter>]**
* **For more MySQL queries, go to** [**www.w3schools.com/sql**](http://www.w3schools.com/sql) **or google it!**

**Initial Table: It's a bit different than Lab 01!**

| **std\_id** | **name** | **major** | **section** | **days\_present** | **project\_marks** | **cgpa** | **submission\_date** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| s001 | Abir | CS | 1 | 10 | 18.5 | 3.91 | 2018-09-15 |
| s002 | Nafis | CSE | 1 | 12 | 20 | 3.86 | 2018-08-15 |
| s003 | Tasneem | CS | 1 | 8 | 18 | 3.57 | 2018-09-18 |
| s004 | Nahid | ECE | 2 | 7 | 16.5 | 3.25 | 2018-08-20 |
| s005 | Arafat | CS | 2 | 11 | 20 | 4.0 | 2018-09-13 |
| s006 | Tasneem | CSE | 1 | 12 | 17.5 | 3.7 | 2018-08-15 |
| s007 | Muhtadi | ECE | 1 | 10 | 19 | 3.67 | 2018-09-16 |

**Link for Table Data:** [**https://docs.google.com/document/d/1ZFFMN863k9GOjTG6ibbCAEEdqF3ExJzug-ymPON6ofA/**](https://docs.google.com/document/d/1ZFFMN863k9GOjTG6ibbCAEEdqF3ExJzug-ymPON6ofA/)

The purpose of the SELECT statement is to retrieve and display data from one or more database tables. It is an extremely powerful command. SELECT is the most frequently used SQL command and has the following general form:

SELECT [DISTINCT | ALL] {\* | [columnExpression [AS newName]] [, . . .]}

FROM TableName [alias] [, . . .]

[WHERE condition]

[GROUP BY columnList] [HAVING condition]

[ORDER BY columnList]

columnExpression represents a column name or an expression, TableName is the name of an existing database table or view that you have access to, and alias is an optional abbreviation for TableName.

**The sequence of processing in a SELECT statement is:**

| ↓ | **FROM** specifies the table or tables to be used |
| --- | --- |
| **WHERE** filters the rows subject to some condition |
| **GROUP BY** forms groups of rows with the same column value |
| **HAVING** filters the groups subject to some condition |
| **SELECT** specifies which columns are to appear in the output |
| **ORDER BY** specifies the order of the output |

**The order of the clauses in the SELECT statement cannot be changed. The only two mandatory clauses are the first two: SELECT and FROM; the remainder are optional. The SELECT operation is closed: the result of a query on a table is another table.**

**Task 1: Aggregate Functions, Group By and Having:**







* How will you retrieve the last submission date? 





* What is the purpose of the group by keyword? In the above command, if we group by sub\_date, instead of major, what will be the output?









* The having and where clauses are both used to specify a condition when selecting rows. What is the difference between them?



**Task 2: Sub Queries/Nested Queries, Any and All:**

* Think about how you can retrieve the names of students who got the highest project marks. Try out your query. Did you get the “correct” response according to the table?







* Did you understand the role of “any” and “all” in the above queries? Explain below.



* Retrieve the names of the students who have received marks greater than at least 1 student doing the same major as them.[Hint: see next command]

**Task 3: Correlated Subqueries and Exists:** 



* L1 and L2 are temporary aliases and create two separate instances for Lab\_Grades; why are they required?







* Please identify the difference between the above two queries. [Hint: 1 asks for unique-only 1 student got the highest and the other didn’t]













**Task 4: Take a Quiz**

Go to <https://sqlzoo.net/wiki/Nested_SELECT_Quiz> to test your understanding of the queries taught in class.