

# CS245: Databases

## SQL

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## Introduction

- Customize input handling - with MySQL works with SQL statements. However, application programs customize input methods for the users.
- Validate input provided by the user - input sanity check is important which result in a cleaner SQL statements.
- Generate inputs automatically - some application might not even involve human users example when an input to MySQL is generated from a program
- Customize output - MySQL output is unformatted. Depending on the application and the context, output customization is necessary for various use cases

## Introduction

- Work around constraints imposed by the nature of SQL itself - SQL scripts consist of a set of statements executed one at a time from beginning to end with minimal error checking.  
In general the requirement for tasks that involve master-detail relationships and have complex output-formatting requirements.
- Integrate MySQL into any application - client programming interface gives the means to benefit the capability of a database to provide information.

## Introduction

- Use a web server to provide enhanced access to MySQL
- Use MySQL to enhance the capabilities of web server

## Available APIs for MySQL

- MySQL server has low-level native client-server protocol that defines how client programs establish connections and how to communicate using the established connections
- Clients can use this protocol at various levels of abstraction

## Levels of Abstraction

- MySQL provides a client library written in the C programming language
- This enables to access MySQL databases from within any C program
- MySQL interfaces for other languages can link the C client library into the language processor.
- The client library thus provides the means whereby MySQL bindings for other languages can be built on top of the C API.
- This type of interfaces exists for Perl, PHP, Python, Ruby, C++, Tcl and others

## APIs

- The C client library API is the primary programming interface to MySQL. It is used to implement the standard clients in the MySQL distribution such as `mysql`, `mysqladmin` and `mysqldump`
- The PHP API is a server-side scripting language that provides convenient way of embedding programs in Web pages.

# Embedded SQL - PHP - 01

## Required package for ubuntu

To use MySQL with PHP, install php-mysql package in ubuntu as `sudo apt-get install php-mysql`



# Embedded SQL - PHP - 02

## General structure

- Establish a database connection
- Embedded SQL statements
- Fire SQL queries (to database through established connection)
- Close connection