

CS 387 Project : Educational Interface for XData

PROBLEM DEFINITION

SQL statements are being used extensively in database applications. But currently validation of SQL statements, whether they achieve the required result or not; has to be done manually. That naturally results in some inevitable human error. As a remedy, IIT Bombay has been developing **XData**, which automates the validation of queries by generating multiple critical data sets over which to test the queries so as to ensure their validity.

In this project, we try to build an interface to the ongoing **XData** project so that students and instructors can benefit from it, additionally getting rid of chances of human error by TAs while evaluating the SQL queries. We basically intend to design a learning tool, where instructors can add assignments for students, for which they are supposed to submit queries. And then students could test/submit queries and receive feedback/grade for their queries.

REQUIREMENTS DEFINITION

The project that we are building would extensively use PHP and MySQL connections for all the DB operations. Currently we are starting with only MySQL support, may be later we would allow other DB services (PostgreSQL ...).

Our Interface would use XData which is being independently developed, as a black box. In other words, XData would do the generation of the datasets and the testing of query on them. Our interface would act as a bridge, that would facilitate the integration of custom schemas (provided by instructors) and submission of queries to XData and interpreting the results.

The interface would have separate logins for faculty and students. We might integrate the login authentication with IITB LDAP. We would thus have separate accounts for each student on the server and we can keep track of their performance or some other metrics.

After logging in, the faculty members would have an option of creating/uploading/linking to the schema over which the students would be writing queries. We have several options for this and we would chose the most one that would be most scalable. We could accept a link for the DB connection, or we could import the schema and replicate it on the server and run tests on that. The instructor would also have to provide one or more "correct" queries (depending on several factors).

Similarly, the student would see several assignments after logging in. We can have two or more types of assignments ... practice/graded. They would then be able to submit SQL queries for particular assignment. After submitting a query for an assignment, we would run it against a sample data set (just to avoid common syntactic errors) and then it would be submitted for grading if it passes the sample data set.

We have several other plans like, may be providing feedback to students if their query does not pass any dataset. Or we can further add courses under instructors and so on ...

Instructor Interface

Exercises for CS 420

<div>Add New Exercise</div>			
#1	Max. Marks : 15	Deadlines:	✓ (6)
#2	Max. Marks : 100	Deadlines:	✓ (7)
#3	Max. Marks : 50	Deadlines:	⚙
#4	Max. Marks : 25	Deadlines:	📅
#5	Max. Marks : 11	Deadlines:	📅

Student Interface

Exercise-2

Maximum Marks : 100

```
select p.course_id,p.prereq_id,c1.title,c2.title from prereq as p,course as c1,course as c2 where p.course_id=c1.course_id and p.prereq_id=c2.course_id and c2.title = 'World History';
```

~ Submission ~

Enter your SQL query here...

Submit your solution

~Submissions Done~

select p.course_id,p.prereq_id,c1.title,c2.title from prereq as p,course as c1,course as c2 where p.course_id=c1.course_id and p.prereq_id=c2.course_id	Submitted On: 11/08/2012 04:58
	Marks Obtained: 57
	Evaluation: ✓ ✓ ✗ ✗ ✗ ✓ ✓
select p.course_id,p.prereq_id,c1.title,c2.title from prereq as p,course as c1,course as c2 where p.prereq_id=c2.course_id	Submitted On: 11/08/2012 04:56
	Marks Obtained: 28
	Evaluation: ✓ ✗ ✗ ✗ ✗ ✓ ✗
select p.course_id,p.prereq_id,c1.title,c2.title from prereq as p,course as c1,course as c2 where p.course_id=c1.course_id	Submitted On: 11/08/2012 04:55
	Marks Obtained: 0
	Evaluation: ✓ ✗ ✗ ✗ ✗ ✓ ✗
select p.course_id,p.prereq_id,c1.title,c2.title from prereq as p,course as c1,course as c2 where p.course_id=c1.course_id and p.prereq_id=c2.course_id	Submitted On: 11/08/2012 04:41
	Marks Obtained:
	Evaluation: ✓ ✓ ✗ ✗ ✗ ✓ ✓
select p.course_id,p.prereq_id,c1.title,c2.title from prereq as p,course as c1,course as c2 where p.course_id=c1.course_id and p.prereq_id=c2.course_id and c2.title = 'World History'	Submitted On: 11/08/2012 04:40
	Marks Obtained:
	Evaluation: ✓ ✓ ✓ ✓ ✓ ✓ ✓