Incr easing a w ar eness of SQL anti-patterns for novices through QuerySandbox

Increasing awareness of SQL anti-patterns for novices through QuerySandbox

Study design
We will conduct a controlled study to see whether QuerySandbox helps novices learn, fix, and avoid writing anti-patterns. In this study, we will have our participants set a series of anti-pattern problems that they must answer using our application. These problems were designed in such a way that they should trigger anti-patterns in query formulation for students that are unaware of them.

The interface of QuerySandbox assists users in becoming aware of, and detecting, anti-patterns. Our participants found QuerySandbox easy to use and found it an improvement over existing systems.

Preliminary results
We ran the study with 4 participants. Based on the confusion matrix, we can see that our participants had a general idea of what the problem was for some of the exercises in the pre-test. However, this was not the case for the vast majority of the problems. Following the main test, we see that for the majority of the problems, our participants could recognize the problem and even identify the anti-pattern to which it is related. As a result, our preliminary findings suggest that QuerySandbox assists users in becoming aware of, and avoiding, anti-patterns.

What is an anti-pattern?
An anti-pattern is a piece of code that is not necessarily incorrect, but can be considered inefficient or harmful. These anti-patterns are well-established and researched in the Software Engineering community. More recently, Karen has defined anti-patterns for SQL queries; however, most educators and students are not aware of these patterns. This, combined with the many factors that negatively influence SQL query formulation such as strict syntax and high cognitive load, results in a high number of erroneous and ineffective queries.

We aim to increase awareness of anti-patterns for students, such that they become aware of them and are able to detect them in their work, in order to ensure that they avoid these patterns in their future work.

Implemented anti-patterns

| Ambiguous Groups
| Fear of the Unknown
| Implicit Columns
| Poor Man’s Search Engine
| Random Selection

User quotes
"QuerySandbox will help people who are new to SQL, and people who know how to use it but forget the syntax or best practices after long periods of time."

"QuerySandbox helped me raise my awareness because it brought to my attention how often I introduce anti-patterns to my query – something I wouldn’t have realised without this tool."

"QuerySandbox will help people who are new to SQL, and people who know how to use it but forget the syntax or best practices after long periods of time."

---

Participant 3

---

Participant 2

---

participant 1

---

TU/e

Go to QuerySandbox (find abstract under “Help”)