SQL File Testing Project – Task List, 04/04/2019

Recently added:

* Support for multiple answer options
* Updated template format, with instructor comments marked with three dashes, user comments allowed with two dashes
* New tests and Junit tests for the tests:
  + CondLikeCount – count LIKE keyword for pattern matching, compare
  + CondAndCount – count AND keyword for WHERE clause, compare
  + CondNumLinesCount – count number of lines in query, compare
  + CondUnionCount – count number of UNION keywords, compare
  + CountAvgCount – count number of AVG function keywords, compare

To do:

* Add code to shareable repository (e.g. GitHub)
  + Now, if can limit access
  + Later, for public release
* Compare similar systems in existence
  + E.g. <https://github.com/bu-ist/bux-sql-grader> - for MySQL only?
  + E.g. <https://github.com/meice147/SQL_Grader_CMU> - ???
  + also SQL tutors (SQL Tutor at U of C in New Zealand)
  + also SQL Query Visualization (e.g. Ryan Hardt’s work)
  + Others? – research…
* Evaluation Files
  + Better formatting (even field widths)
* Test Structure
  + Can range expressions be passed to JavaScript engine? If so, can use in COND tests.
* Better Tests
  + **Fix countMatches method – can’t count instances of string in column aliases, table aliases, or literal strings**
  + **ResultSetEqualContents – right now, only testing number of rows and columns**
    - **Need to assign any value between 0 and 10**
    - **What if close? (e.g. 1 row off)**
    - **Student result set is subset of desired answer subset**
    - **Student result set is superset of desired answer subset**
  + Test position of DISTINCT – at top level or another level (or multiple?) (may be additional test)
* Additional Tests (implement test, add unit tests)
  + Is table X present in submitted query? (not sure where this fits in current structure or if we need to expand test options)
  + **Style test – better test for SQL statement not all on one line, broken into multiple lines by keyword, though may want to allow some flexibility (e.g. SELECT and FROM on one line, JOIN and ON, WHERE and AND/OR, etc.? (Emma and Spencer)**
  + **Condition – Column Count compared with expression**
  + **Condition – count of SQL-92 style joins (with comma-separated tables)**
  + **Condition – count of SUMs**
  + **Condition – count of MAX**
  + **Condition – count of MIN**
  + **Condition – count of INTERSECT**
  + **Condition – count of MINUS**
  + **Condition – count of OR**
  + **Condition – count of NOT**
  + Other style tests – e.g. consistent capitalization (challenging?)
* Redirect system.err output to a file instead of console
* Additional unit tests beyond SQL tests, query
* Add GUI (JavaFx or SWT?)
* Internationalization – e.g. “marks” in New Zealand, “points” in USA
* What is the optimum test specification for a given question?
  + …To get the most accurate result?
  + …To make the grading most like a human grader?
* Other uses – e.g. as part of SQL Tutor System on server?
* Write paper for ACM SIGCSE 2020