PROJECT 2: VOCALIZE YOUR PLAN!

CZ4031 DATABASE SYSTEM PRINCIPLES

TOTAL MARKS: 100

Due Date: Nov 17, 2017; 5 PM

A DBMS query optimizer executes a query execution plan (QEP) to process a query. This plan is typically displayed as a tree-structure by your DBMS software. However, to an end user this may not be necessarily the best way to provide explanation of how a query has been executed. Hence, your goal of this project is to **vocalize the plan in natural language** that can be understood by a user. Specifically, given a query Q and its executed plan P, your goal is to vocalize P to the end user. To this end, you should follow these steps:

- Design and implement an algorithm that takes as input a query execution plan of Q, and generates a text description of it. Your goal is to ensure generality of the solution (i.e., it can handle a wide variety of query plans on different databases) and the text description should be **as concise as possible** without sacrificing the content of the plan. *Hint: You need to traverse the query plan tree as well as exploit database schema information to address this problem. Further, this can be posed as an optimization problem.*
- Vocalize the generated text description by using off-the-shelf Text-to-Speech (TTS) software.

You can use **Java or Python** as the host language for your project. A user should be able to read and hear the text when he/she executes a query using the visual interface of the DBMS. The DBMS allowed in this project is **PostgreSQL.**

You submission should include the followings:

- Hard copy of the description of the algorithm (with examples) used to address the problem.
- Hard copy of the source code.
- Hard copy of screenshots of the query plan, its corresponding text description for **all queries** studied in Project 1. That is, the database created for Project 1 is used as an example to demonstrate your project.
- Submit a softcopy of the program through NTULearn. Note that we will execute the software to check its correctness on a **different** database to check for the

generality of the solution. You may attach an installation guide to ensure that your software can be run successfully.

Note: All hard copies need to be submitted to the Software Project Lab by 5 PM latest on Nov 17, 2017. Late submission will be penalized.

We may randomly select one or more groups to demonstrate their project subsequently.