CONCORDIA UNIVERSITY

DEPARTMENT OF
COMPUTER SCIENCE AND SOFTWARE ENGINEERING

SOEN 6751, Winter 2020 Instructor: R. Jayakumar

PROJECT

Issued: Jan. 22, 2020 Due: Apr. 8, 2020

Note: *Each team must electronically submit a single report for the project and also demo the implementation. The report should identify individual contribution by each student of the team. The project will be marked based on the report and the demo and questions to individual students during the demo.*

Self-Adjusting Smart Interface for Program Development using GCC Compiler

This project is to design and implement a self-adjusting smart graphical interface for C++ program development using the GCC compiler (let's call it SmartGCC). Your interface is to be designed for three types of users:

- *Novice user learning programming*: need to use compiler options, linking options, execute options and debugging options.
- *Typical Programmer*: need to use code generation and code optimization options in addition to the options used by novice users.
- *Expert Developer*: need to use the developer options in addition to the options used by typical programmers.

You can read about all these options supported by GCC and how to use them through the command line at https://gcc.gnu.org/onlinedocs/gcc-9.2.0/gcc/ (this document is also posted on the course web page). Analyze these options and design how to show the relevant options in the SmartGCC graphical interface and let the user select the required option effectively and efficiently.

The SmartGCC interface should have two windows, one showing the program the user is working on and the other showing the result/output from GCC, in addition to all the available options for the user. When SmartGCC is installed, it prompts the user to select the user type and initializes the interface with the menus and commands for the selected user type. The interface for all types of users should also contain a menu item called "All Options" containing all the options that any user can select. Once the user selects the required options, SmartGCC should execute the program using the selected options by calling GCC through an appropriate command line and display the results. Your interface should be made self-adjusting in the sense that when a user performs a command/task from the "All Options" menu which is not included in the interface for his/her user type, the interface will include that command within appropriate menus from that time. Thus, eventually all the commands a user has used in the past will be available in the appropriate menus and can be used efficiently. You should also implement a proof of concept prototype of SmartGCC using GCC in the background.

The design of the interface is done through the three assignments and the implementation is done through the project as follows:

Assignment 1: Identify the users and their needs and establish a stable set of requirements for this self-adjusting interface. (Due on February 12, 2020.)

Assignment 2: Come up with multiple conceptual designs satisfying the requirements and interactive prototypes for each of the designs. (Due on March 4, 2020.)

Assignment 3: Evaluate the conceptual designs using their prototypes and select the most appropriate design for implementation. (Due on March 18, 2020.)

Project: Implement the selected design using an installation of GCC and illustrate its five E's. (Due on April 8, 2020.)

In order to achieve a good design from multiple perspectives, the assignments and project should be completed by teams of six students. Members of the team are expected to come up with different viewpoints and ideas, and include the most appropriate ones in their design. Each student should actively contribute in the assignments and project and the submitted reports should identify individual contributions. Each team should demo their implementation at the end of the term and the project will be marked on the basis of the submitted report and the demo.