**CPSC 311 – Term Project**

*Proposal: Logical Expression -> Logical Circuit (LETLC language)*

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The Logical Expression -> Logical Circuit language (or simply LETLC, pronounced “Litek”) is a domain specific language designed to autonomously generate logical circuit diagrams from user-provided logical expressions. To elaborate, the user can enter a logical expression in a concrete syntax similar to the Racket language into a Racket file. The LETLC will then parse the given expression into an abstract syntax and proceed to interpret it into a corresponding circuit diagram. The Racket language and its pict library will be the foundations for the creation of this language. The primary motivation behind the development of this language is to provide a clearer visual representation of unfamiliar Boolean algebra and circuit design concepts for students. Both of which are heavily emphasized in lower level undergraduate Computer Science courses. The language may also be used by course staff to help the development of new exam/homework questions, as well as solutions to some logical statement/circuit design problems.

To realize the language, we will split the project into multiple milestones. The first step in our strategy is to perform sufficient background research on relevant topics. The key research topic would be methods to convert logic formulas into circuit diagrams. Consequently, this would involve researching about formula parsing, simplification of logic expressions, diagram generation, image creation for functional programming (or recursive algorithms). All group members will contribute to the research of these core topics above. Furthermore, as the Racket pict library is core to our language interpreter, we will likely dedicate 1-2 members to specially focus on the documentations, tutorials and demos involving the use of the library. Some other topics that we will might also conduct research on include syntax choices, impact in educational settings and possible GUI designs etc. Once we have completed most of the research (1 week before background research report submission), we will compile our results into a single background research document highlighting our research on the topic.

The next milestone of our project is the proof of concept and plan

**Exact project to be determined**

1. **The Project Topic and Type**
2. The Project Topic
3. How the Project Belongs to the Proposed Type
4. What the Project Should be after Finished
5. **Plan for Subsequent Milestones.**

**References**