Lucas Turpin (40029907) Assignment 4

COMP 442 - Presented to Prof. Joey Paquet on April 14, 2020

Section 1: Rules Implemented

Reference	Implemented	Comments
1.1	Yes	Stack frame offsets are calculated for each variable and temporary result. These can be seen in *originalfilename.outsymboltables*.
1.2	Yes	
1.3	Yes	
1.4	Yes	
2.1	Yes	
2.2	Yes	
2.3	Yes	Return value is found at offset 0 in a stack frame
2.4	No	
3.1	Yes	Only *integer* values can be used
3.2	Yes	
3.3	No	
3.4	Partial	Only *write* is implemented
4.1	No	
4.2	No	
4.3	No	
4.4	No	
5.1	Yes	
5.2	No	
5.3	No	

Section 2: Design

I. I reused the existing visitor pattern created to perform semantic analysis. I made some minor additions to the data structures to allow tracking of code lines being generated and state while visiting the AST nodes.
   To facilitate formatting of the moon code, I created some models to store instructions (Line) and function blocks (Function). These are regrouped into a Prog object which can then be used to flatten the structure into the resulting moon code file.
   I added new attributes to SymbolTable Records to capture information around memory allocation.

II. I modified the existing type checking phase to capture more information about symbol table records, create necessary temporary variables for sub-expressions and embed the records into the AST. I added a new Visitor phase which runs last to generate the code using the data found in the AST.

Section 3: Use of Tools

I use the provided Moon Simulator and its sample moon source code files, specifically *lib.m*.