EECS 3311: Lab2

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Project Summary

In this project, we are instructed to complete the design and implementation of analyzing Python-- program (i.e., a simplified version of Python program language), which contains two associated functionalities, i.e., control-flow-graph (CFG) generation and analysis. In this lab, we use LinkedList based directed graph to build and represent CFGs

We implement the graph using adjacency matrix.
We implement the CFG using composite and visitor pattern.

For our project we use composite design pattern and visitor design pattern

Composite pattern

Composite pattern is a partitioning design pattern and describes a group of objects that is treated the same way as a single instance of the same type of object. The intent of a composite is to “compose” objects into tree structures to represent part-whole hierarchies. It allows you to have a tree structure and ask each node in the tree structure to perform a task.

Visitor pattern

Visitor design pattern is one of the behavioural design patterns. It is used when we have to perform an operation on a group of similar kind of Objects. With the help of visitor pattern, we can move the operational

logic from the objects to another class.We use the information hiding where we are hiding the details of our design to the clients
We use single-choice principle and open-closed principle by implementing the visitor design pattern
We use Uniform Access Principle to decide upon storage vs computation implementation of attributes.