Automata Lab 2

Shubh Gupta, Poorva Garg

Choice of Data Structure

- FlowGraph -
    - Map from Method to EntryNodes
    - Set of Methods, Nodes, and Return Nodes
    - A map from the nodes to the set of pair of nodes and method(inlcuding ϵ)
- DFA - Similar to Lab1
- CFG -
    - A map for production rules from non-terminals to a set of possible set of list of terminals and non-terminals

Handling Calls to functions without flowgraph

We have not implemented this in our tool but we can consider a single node for such functions which act as both entry and the return nodes

Underspecified DFA

If there is a method in the FlowGraph such that the DFA does not have any transition corresponding to it, the DFA goes into a rejection state.

Search for counter-examples

First we checked the emptiness of the language by checking whether the initial symbol is generating or not. If it is generating, we used stacks to trace the generating sequence of non-terminals for the input symbol.

Effect of Input Size on Performance

Increasing the input size has an exponential increase in the complexity of the product construction which in turn implies the same increase in checking the emptiness of the language

We could have optimized the code by using additional data structures so as to avoid loops and complexity overhead for searching for some state.