National University of Sciences and Technology (NUST)
School of Electrical Engineering and Computer Science

Department of Computing

CS 354: Compiler Construction

Class: BSCS-5AB

Lab 11: Syntax Directed Defintion (SDD)-Synthesized Attribute

Date: 20th December, 2018

Time: [09:00am – 12:00pm/2:00 pm – 5:00 pm]

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Introduction

Syntax Directed translation (SDT) controls the execution of a context-free grammar together with attributes and rules given in the form of Syntax Directed Definition (SDD). Attributes are associated with grammar symbols and rules are associated with productions. An attribute has a name and an associated value: a string, a number, a type, a memory location, an assigned register, strings. Attributes associated with the grammar symbols can be of two types: *Synthesized* and *Inherited*

Objectives

Successful understanding of S-attributed grammar using Bison

Tools/Software Requirement

gcc, g++, Flex and Bison

Description

Synthesized Attribute: Value of the attribute computed from the values of attributes of grammar symbols on RHS.

Actions associated with each production in a grammar. For a production A → X Y, actions may be of the form:

A.attr := f(X.attr, Y.attr) for synthesized attributes

A grammar is said to be *S-attributed grammar* if all of its attributes are synthesized.

Lab Tasks

For the given S-attributed grammar:

E → E * E
E → E + E
E → int

1. Write the syntax directed definition (SDD) to evaluate an expression and implement it in Bison. Print on console the value of each of the synthesized attribute in the SDD.

2. Show the tranlstion of the implemented SDD on an expression **3*2+5.**

Deliverables

You are required to upload your task (Sources & Word/PDF document) using the link created on LMS followed by a viva.