Compiler Design

CSE - 420

Assignment 03

Spring 2025

Note that:

1. *You will have to submit the hard copy*
2. *Make an cover page which contains you name,student ID and section*

Deadline: 29 April,2025

Draw the annotated parse tree for the input string using the attribute grammar given below. Then you have to compute the values of the type, width, and offset attributes for each variable following the SDD rules given in the attribute grammar and draw the attribute dependency arrows in your parse tree.

Note that the submission will be checked for plagiarism.

Input String: int a;
record{
float b;
int [2] [3] [4] ab;
}r;
int abc;

$P \rightarrow$ { $offset = 0;$ } D

$D \rightarrow T$ **id** ; { $top.put(\mathbf{id}.lexeme,\ T.type,\ offset);\ offset = offset + T.width;$ } D_1

$D \rightarrow \epsilon$

$T \rightarrow B$ { $t = B.type;\ w = B.width;$ } C {T.type = C.type; T.width = C.width}

$T \rightarrow$ **record** '{' { $Env.push(top);\ top = \mathbf{new}\ Env();\ Stack.push(offset);\ offset = 0;$ } D '}' { $T.type = record(top);\ T.width = offset;$ $top = Env.pop();\ offset = Stack.pop();$ }

$B \rightarrow$ **int** { $B.type = integer;\ B.width = 4;$ }

$B \rightarrow$ **float** { $B.type = float;\ B.width = 8;$ }

$C \rightarrow \epsilon$ { $C.type = t;\ C.width = w;$ }

$C \rightarrow$ [**num**] C_1 { C.type = $array(\mathbf{num}.value,\ C_1.type);\ C.width = \mathbf{num}.value \times C_1.width;$ }