

Type Resolution

PAGE NO.:

DATE: / /

- "*" have the following definitions:

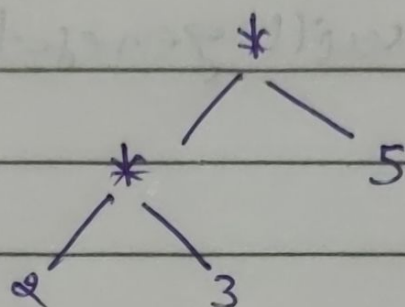
$\text{int} \times \text{int} \rightarrow \text{int}$

$\text{int} \times \text{int} \rightarrow \text{complex}$

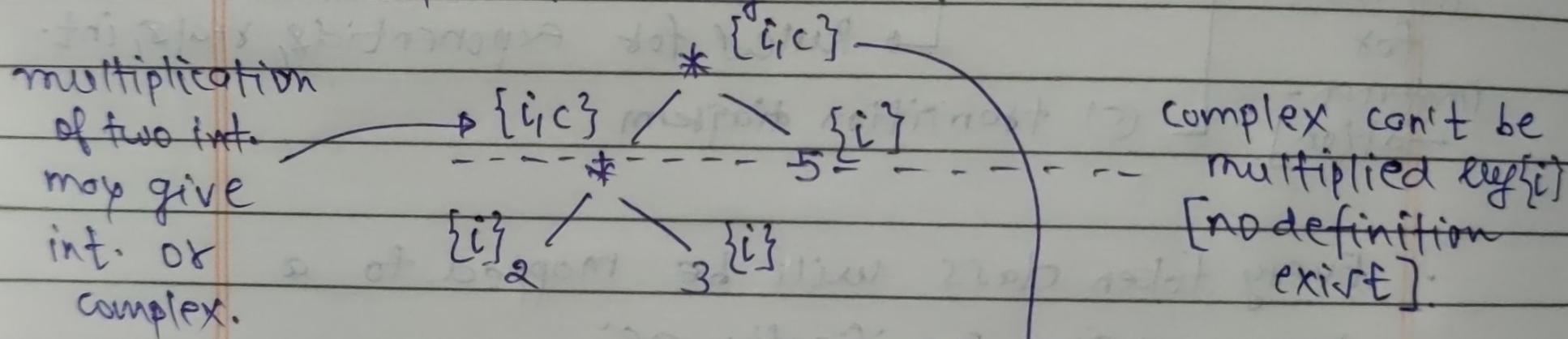
$\text{complex} \times \text{complex} \rightarrow \text{complex}$

Ex: We have: $((2 * 3) * 5)$

Expression tree for the above will be:



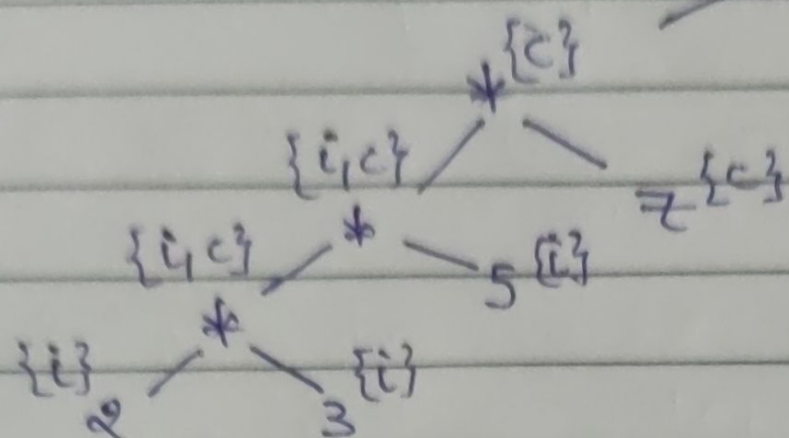
(a) Bottom-up: - Start from 2, 3, 5 and move upwards building a set of types for every node.



(b) top-down: - Start node has two types and hence, it will be a type error. [We are not looking at its context and that's why it is an error].

[Ex]:- We have : $((2+3)+5)*z$

(a) Bottom-up:-

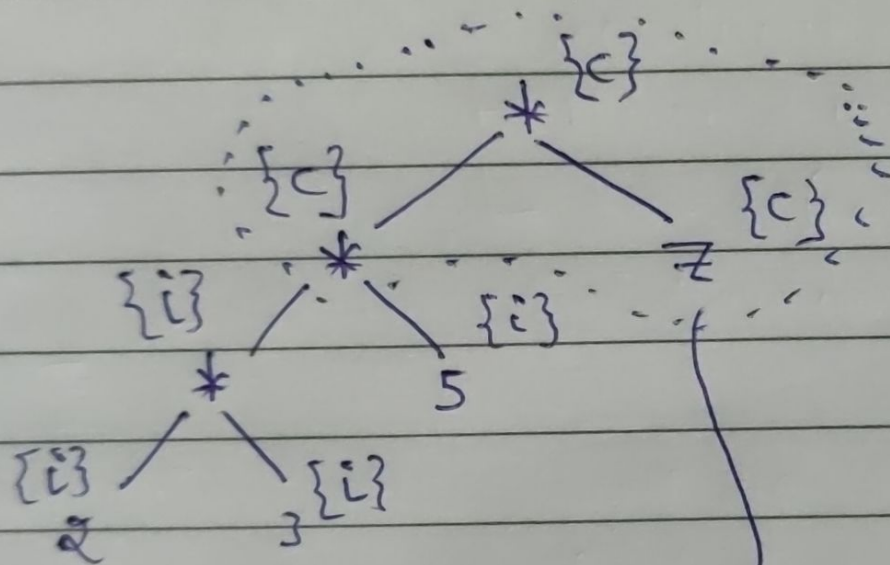


left hand "*" must have to be of type "complex"

{will be fixed in top-down}

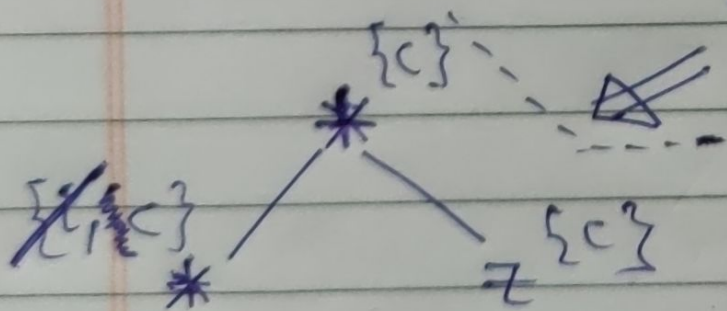
(b) top-down pass:-

Root have only one type and hence we will start top-down pass now.



\Rightarrow all the nodes have only one unique type and hence, no type error.

To narrow-down the sets, look at semantic rule that type checker has developed:



$\Rightarrow E_2 \text{ types} = \{ixc, cxc\}$

$\Rightarrow t = E \text{ unique} = \{c\}$

$\Rightarrow S = \{cxc\} \Rightarrow$ only one element