

Quiz 10: Typing Rules

EN.601.426/626 Principles of Programming Languages – SP26

Name: _____

We are introducing a new language TF^bT , which is an extension of TF^b with tuples. The grammar of TF^bT expression and its type system is augmented as follows:

$$\begin{aligned} e &::= \dots \mid (e_1, e_2) \mid \text{Left } e \mid \text{Right } e \\ t &::= \dots \mid t_1 * t_2 \end{aligned}$$

Please write down the typing rules for the new constructs in TF^bT . Remember the typing relation looks like $\Gamma \vdash e : t$.

[Tuple]	_____		
[Left]	_____	[Right]	_____

With your typing rules, please determine the type of the following expression and draw the proof tree for your type judgement:

$\vdash \text{Fun } x:\text{Int} \rightarrow \text{If } x < 0 \text{ Then } (\text{False}, x) \text{ Else } (\text{True}, x) :$