**CS 390 – Week 6**

**Assignment 8**

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**15-June-2019**

**1a)**

Table 1 & 3:

t ::= x

λx:T.t

t t

(t, t) // Add syntactic form for a lone pair

(t, t).fst // Add syntactic form for .fst

(t, t).snd // Add syntactic form for .snd

v ::= λx:T.t

T ::= T -> T

Γ ::= Θ

Γ, x:T

**1b)**

t1 -> t1’

(t1, v2) -> (t1’,v2)

t2 -> t2’

(v1, t2) -> (v1,t2’)

t1 -> v1

(t1, t2) -> (v1, t2)

t2 -> v2

(t1, t2) -> (t1, v2)

(v1, v2).fst -> v1

(v1, v2).snd -> v2

**1c)**

(T8)

Γ, t1: T1 Γ, t2 : T2

(t1, t2) -> (T1, T2)

(T9)

Γ, t1: T1 Γ, t2 : T2

(t1, t2).fst : T1

(T10)

Γ, t1: T1 Γ, t2 : T2

(t1, t2).snd : T2

**2a)**

Statement: (true, 1).fst

(T3) true : Bool

(T3) 1 : Nat

(T9) (true, 1).fst : Bool

Statement: (true,1).snd)

(T3) true : Bool

(T3) 1 : Nat

(T10) (true, 1).snd : Nat

**2b)**

Statement: (succ 5, if false then true else false).fst

(T3) 5 : Nat

(T5) succ 5 : Nat

(T4) if false then true else false : Bool

(T9) (succ 5, if false then true else false).fst : Nat