

## 9 Illustration of Tail recursion

### 9.1 Non tail-recursive procedure f

```
F:=(fun f x = x+f(x+1), int->int, [])
V:=[f:=F, x:=1]
```

```

      V |= f : F      [f:=F, x:=2] |= x+f(x+1) : v2
      V |= x+1 : 2
      -----
      V |= x : 1  V |= f(x+1) : v2  1+v2 = v1
      -----
V |= f : F  V |= x+f(x+1) : v1
V |= x : 1
-----
V |= f x : v1
```

### 9.2 Tail-recursive procedure g

```
G:=(fun g x = g(x+1), int->int, [])
V:=[g:=G, x:=1]
```

```

      V |= g : G      [g:=G, x:=2] |= g(x+1) : v1
      V |= x+1 : 2
      -----
      V |= x : 1  V |= g(x+1) : v1
      -----
V |= g : G  V |= g(x+1) : v1
V |= x : 1
-----
V |= g x : v1
```