

Worksheet – 6

Solution

From lecture given on 01/28/2019

1. Convert the following code to **Static Single Assignment (SSA)** form. You can show your transformed code in source code format, IR format, or as a control flow graph with source/IR statements in each basic block. ↓

↓

x = read(); // read x from stdin ↓

if (x > 10) x = 10; ↓

do { ↓

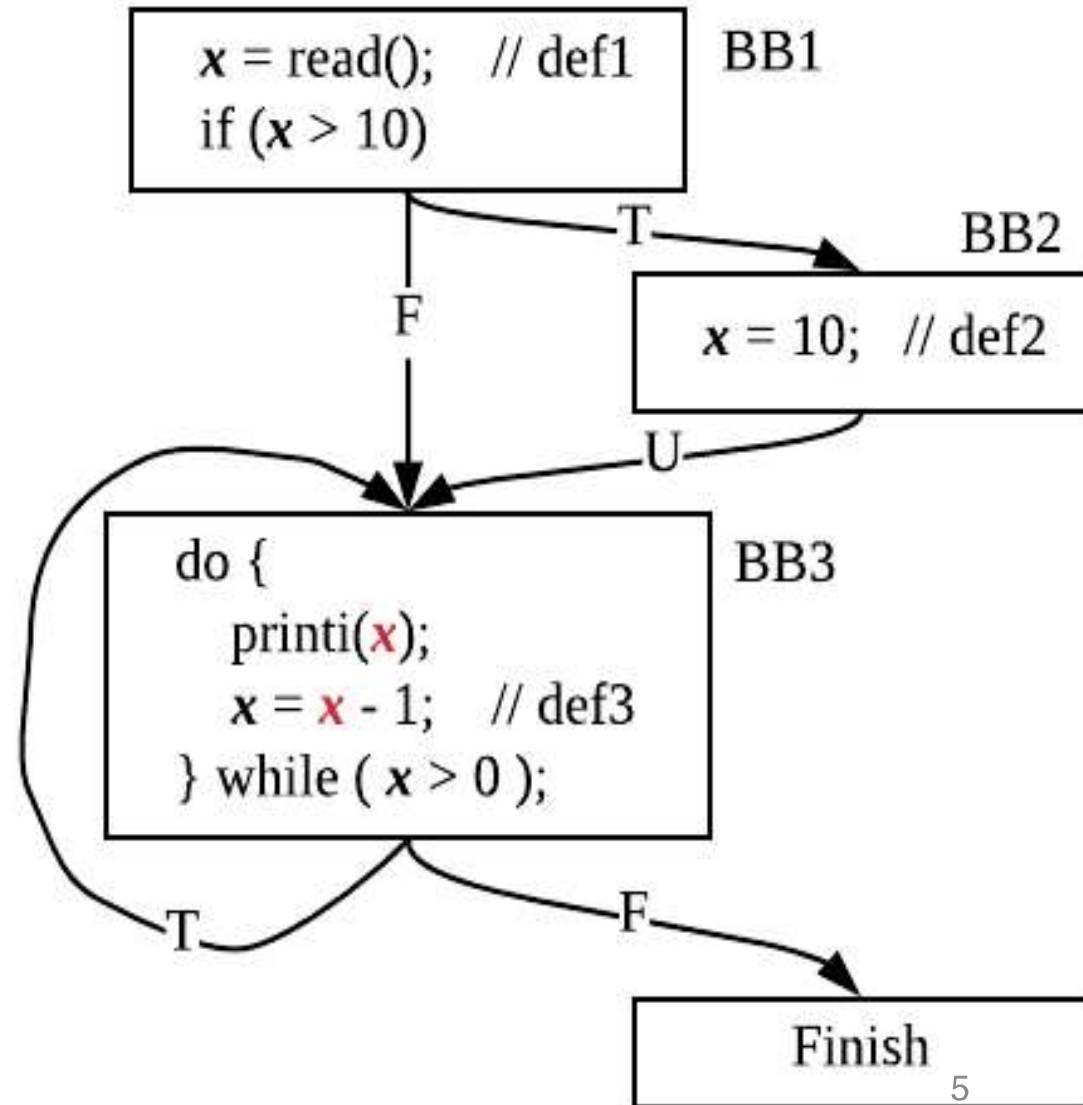
printi(x); **// write x to stdout** ↓

x = x - 1; ↓

} while (x > 0); ↵

Control flow Graph

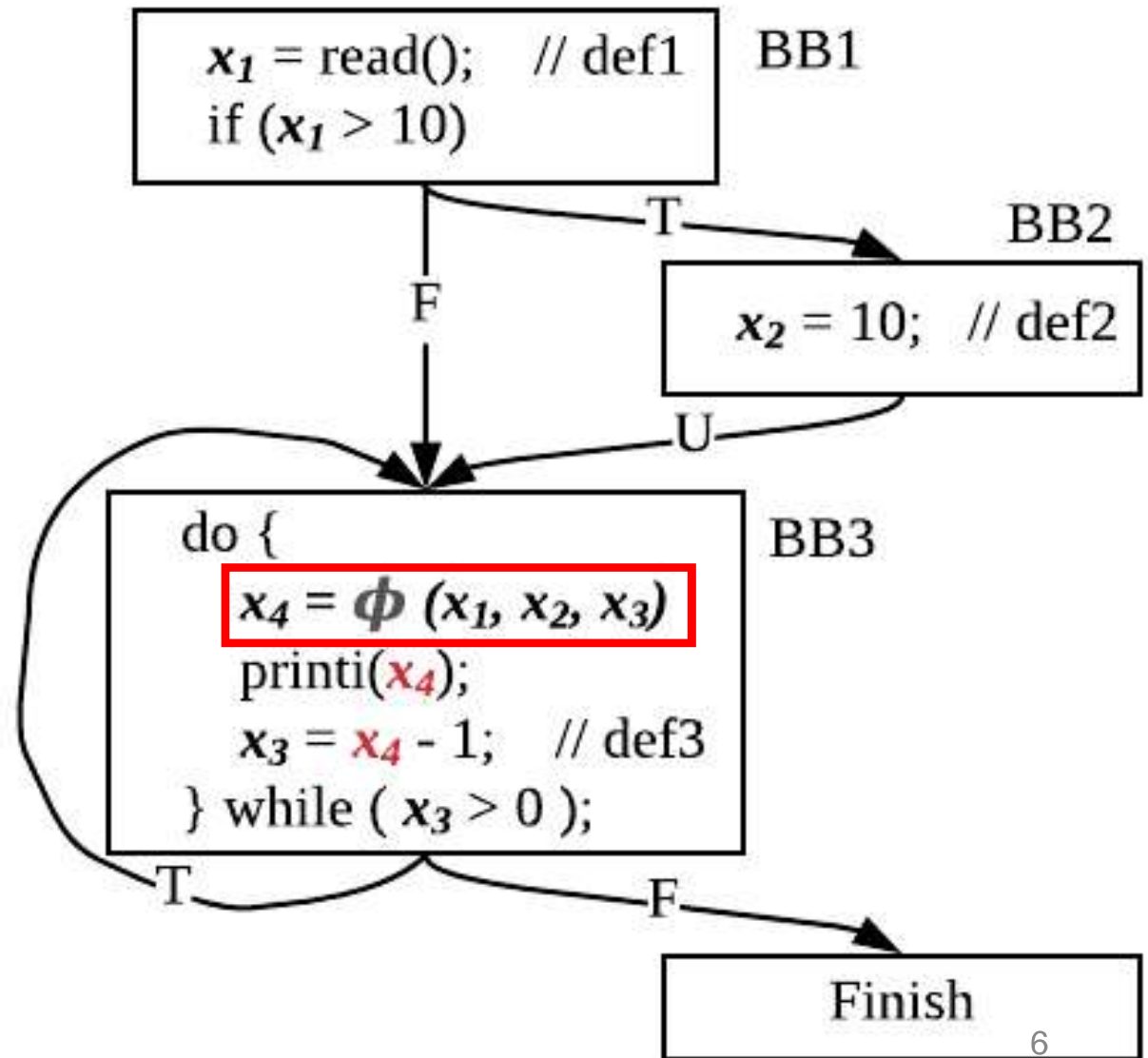
- Observation: def1, def2, def3 all reach uses of x in BB3



Sample Solution #1

For each def of x ,
introduce a new
variable with an
incremented
subscript.

At joints where
multiple **reaching
definitions** of x
merge,
create a new variable
using a
Phi - function.



Sample Solution #2

This solution includes two phi functions, and is closer to what a compiler might generate. However, both solutions are equally acceptable.

