

CmpSci 201

Homework 9

1. Using the single-bus model described in class, enumerate the steps necessary to execute
`STR R1, [R4, R5, LSL #4]`

2. Using the single-bus model described in class, enumerate the steps necessary to execute
`LDM R13!, {R5, R4, R14}`

3. Using a multiple-bus model, enumerate the steps necessary to execute `BNE loop`, where
loop is at address `0xCAFE0000` and the branch instruction is at address `0xCAFE0014`.

4. In the following instruction stream, identify data-dependencies that would cause a stall in a 4-stage pipeline. Indicate the dependencies by circling the operands and drawing a connecting arc between them.

ADD R4, R5, R6

MOV R5, R6, LSL #2

ADD R6, R4, R5

MUL R8, R6, R5