Lab Report 4

Computer Architecture Lab

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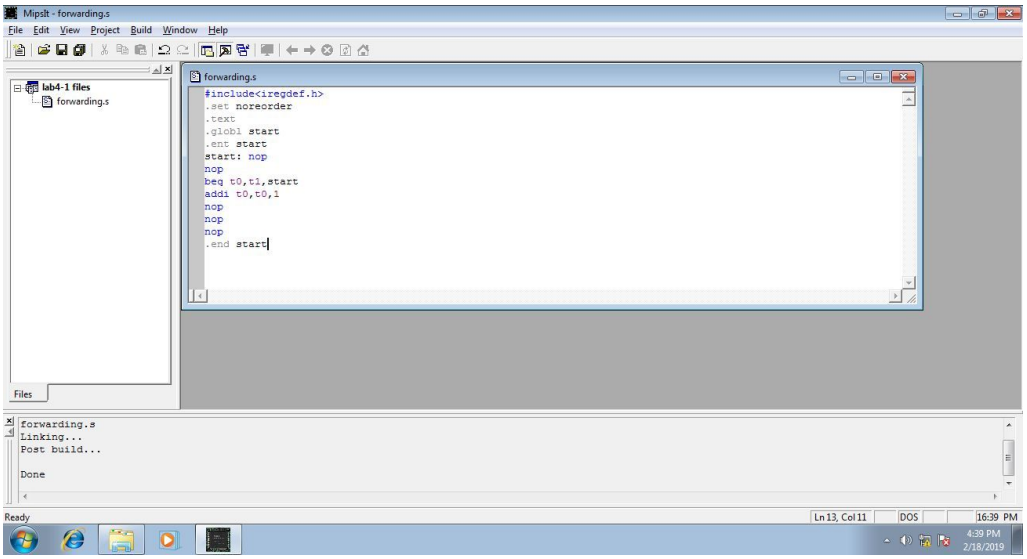
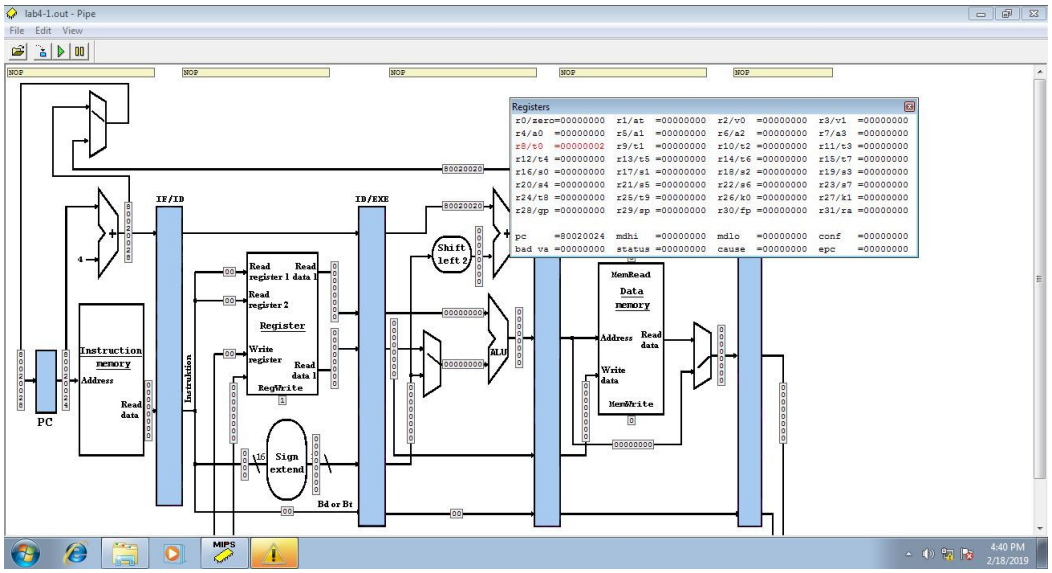
Aim

Run the following programs on pipeline simulator. Use the simple version without forwarding (S-script). Assign the same value to t0 as as to t1, and single step through the instructions.

Questions and Answers

Problem - 1





Answer the following questions:-

1. How many cycles does it take until the branch instruction is ready to jump?

After 5 clock cycles branch instruction is ready to jump.

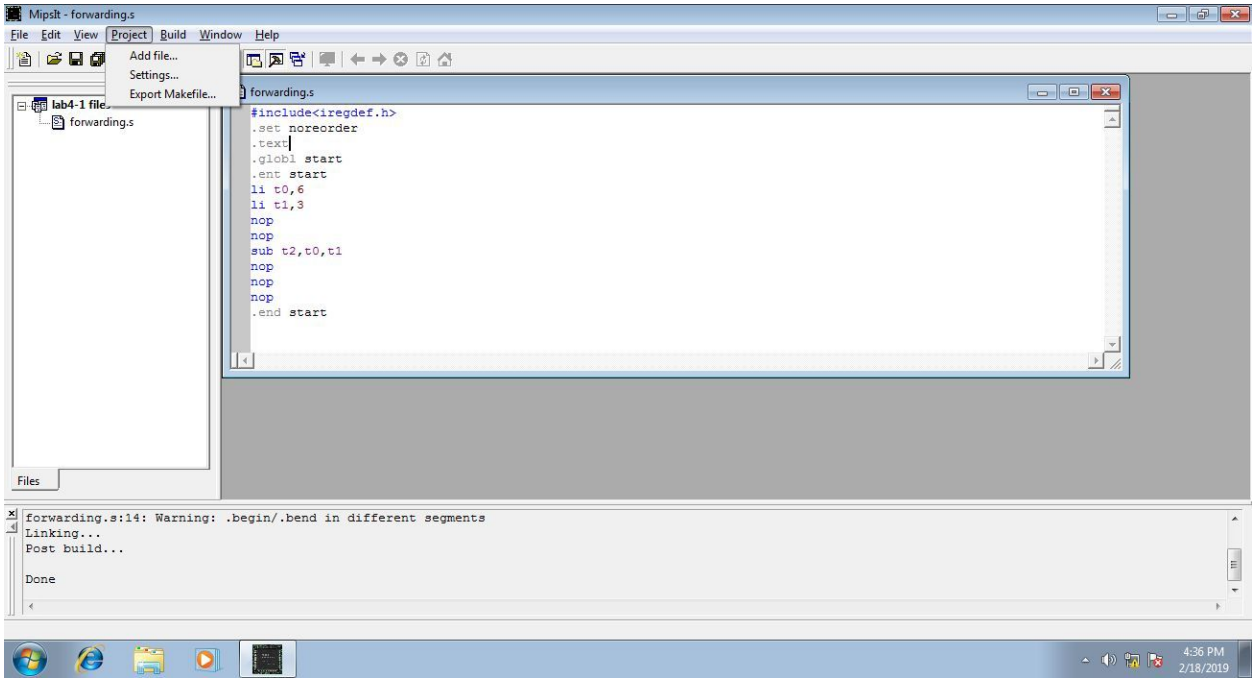
2. What has happened with the following addi instruction while the branch is calculated?

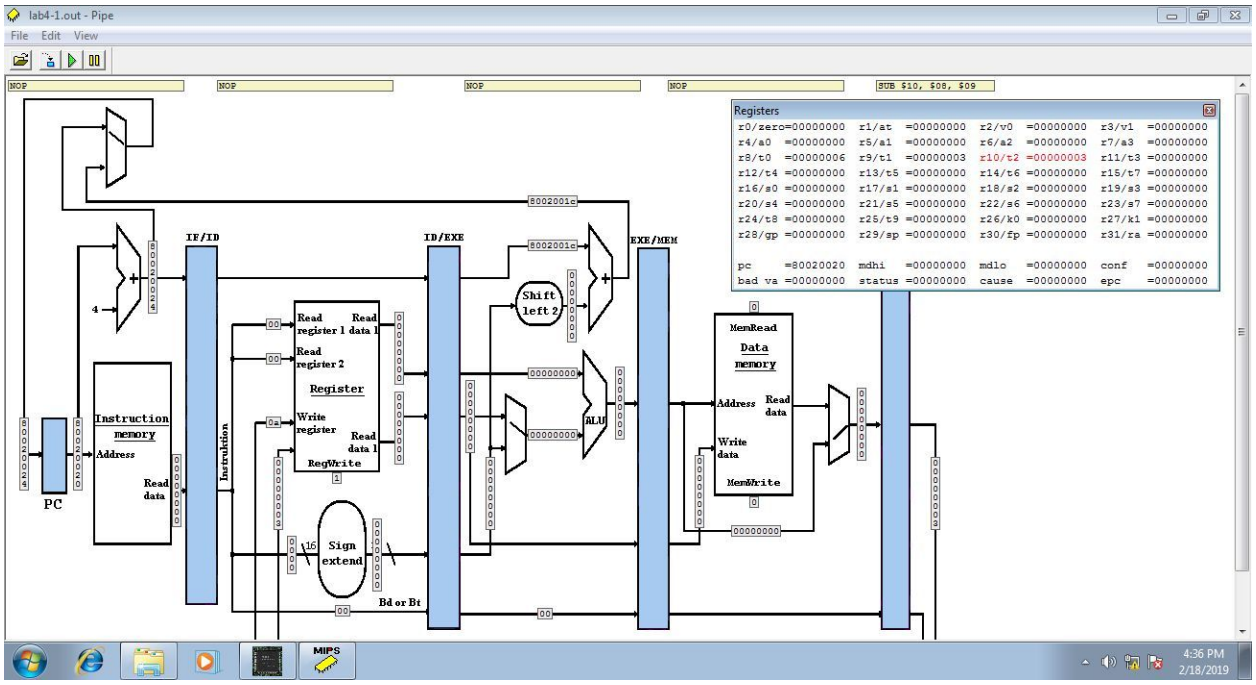
addi instruction was decode stage while is calculated.

3. How does this version handle beq?

In this version beq is calculated before the addi instruction was executed, so the addi instruction execute for two times and value stored in t0 is 2. This is data hazard.(Read after write)

Problem - 2





This code is used to subtract value 3 from 6 and store it into t2.

There are two nop given between load operation and add operation so that it value of register t0 and t1 can be available while decoding of subtraction instruction.