

Computer Architecture

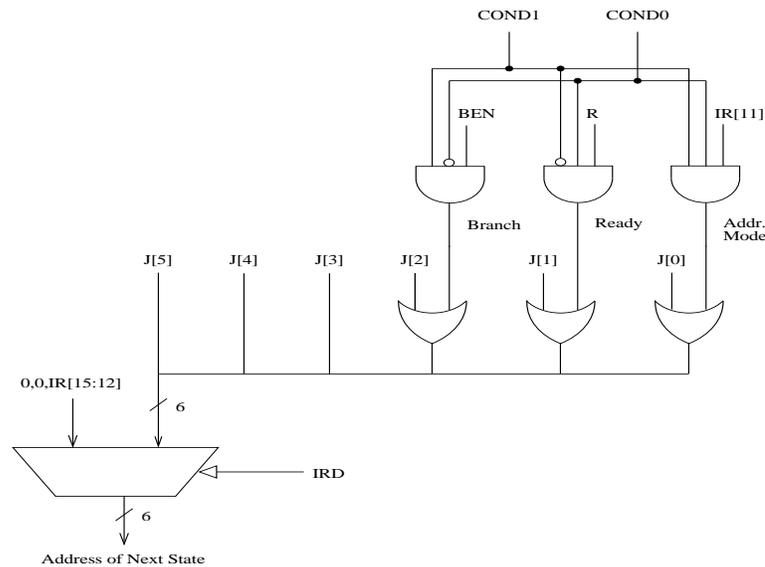
Assignment 8

Due: Next section. (one day before if you submit by email)

Notes: This assignment is individual assignment, every student should complete by himself.

1. (5 Points) shortly explain, how to realize the Multi cycle architecture , then List the benefits of it.

2. (5 Points) The following figure implement the LC-3b microsequencer:



- What is the main purpose/s of this component?
- Where do the values of (J[0],J[1], ..., J[5]) comes from?
- Where do the value of R comes from, and what is the main purpose of this value?
- What are the values of all the shown input bins if IRD=1 ?
- Why there are two zeros before IR[15:12]? **To complete the 6 variables as a state among the 31 states (appendix c page 9 last 4 lines)**

3. (5 Points) Microcode:

We wrote the microcode for some states of the LC-3b microarchitecture in class as show in the following excel sheet:

[Microcode excel sheet](#)

Complete the microcode for the uncompleted states in this sheet. Refer to [Appendix C](#) of Patt and Patel for the LC-3b state machine and datapath and [Appendix A](#) of Patt and Patel for the LC-3b ISA description. Fill out

the microcode in the microcode.xlsx file handed out with this homework. Enter a 1 or a 0 or an X as appropriate for the microinstructions corresponding to states.