# North South University ECE

Experiment No: 6&7

Experiment Title: Build a single cycle data path

Course Code: CSE332L

Course Name: Computer Organization & Architecture Lab

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Date of Experiment: 13.4.2022 Date of Submission: 18.4.2022

# Objective:

• Design data path for R type and I type operation in 16 bit ISA

## Apparatus:

Logisim Tool

### ISA structure:

## R-type

op (4 bit)	rs (4 bit)	rt (4 bit)	rd (4 bit)
I-type			
op (4 bit)	rs (4 bit)	rt (4 bit)	immediate (4 bit)

## Circuit diagram:

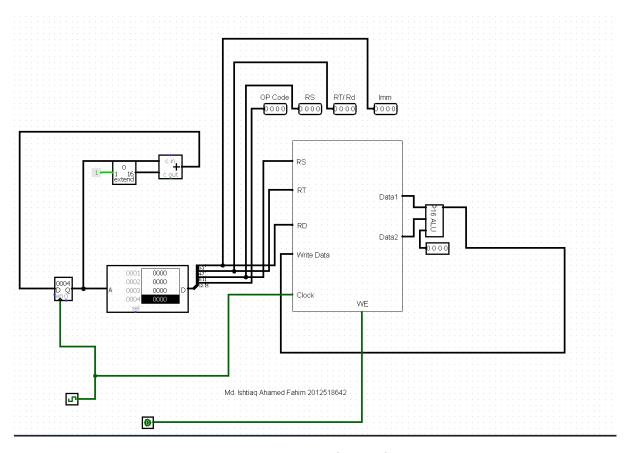


Fig-1: R type ISA instruction

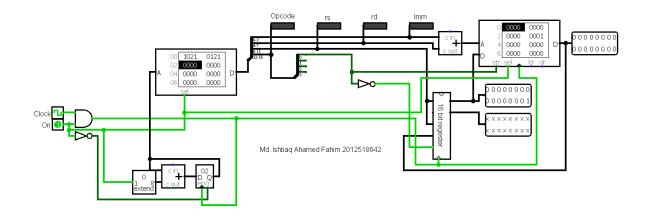


Fig-2: I type ISA instruction

#### I Type Instruction table:

0000	LW
0001	SW

### Discussion:

We learned how to create a 16 bit ISA supported single cycle data path and understand how R type and I type operation works. We understood how both register operation and RAM works and created Data path supporting the those operations in logisim.