Khulna University of Engineering & Technology (KUET), Khulna

Department of Computer Science and Engineering (CSE)

CSE 4224: Digital System Design Laboratory

Title: Data transferring from one tri-state buffer register to another through bus.

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Objectives:

The objectives of this experiment are noted below:

(i) to know about tri-state buffer register.

(ii) to know about bus connection.

(iii) to experiment the passing of data from register to register through bus.

(iv) implementation of the circuit with bus connection and tri-state buffer register.

Introduction:

Tri-state Buffer Register: A buffer register is the simplest kind of register, all it does is store a digital world. It is similar to a buffer but it adds an additional enable input that controlls whether the primary input is passed to its output or not. Basically a tri-state buffer register is a controlled

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buffer register combining with tri-state buffer. D-flip flop are used here. A 4-bit tri-state buffer circuit is implemented below:

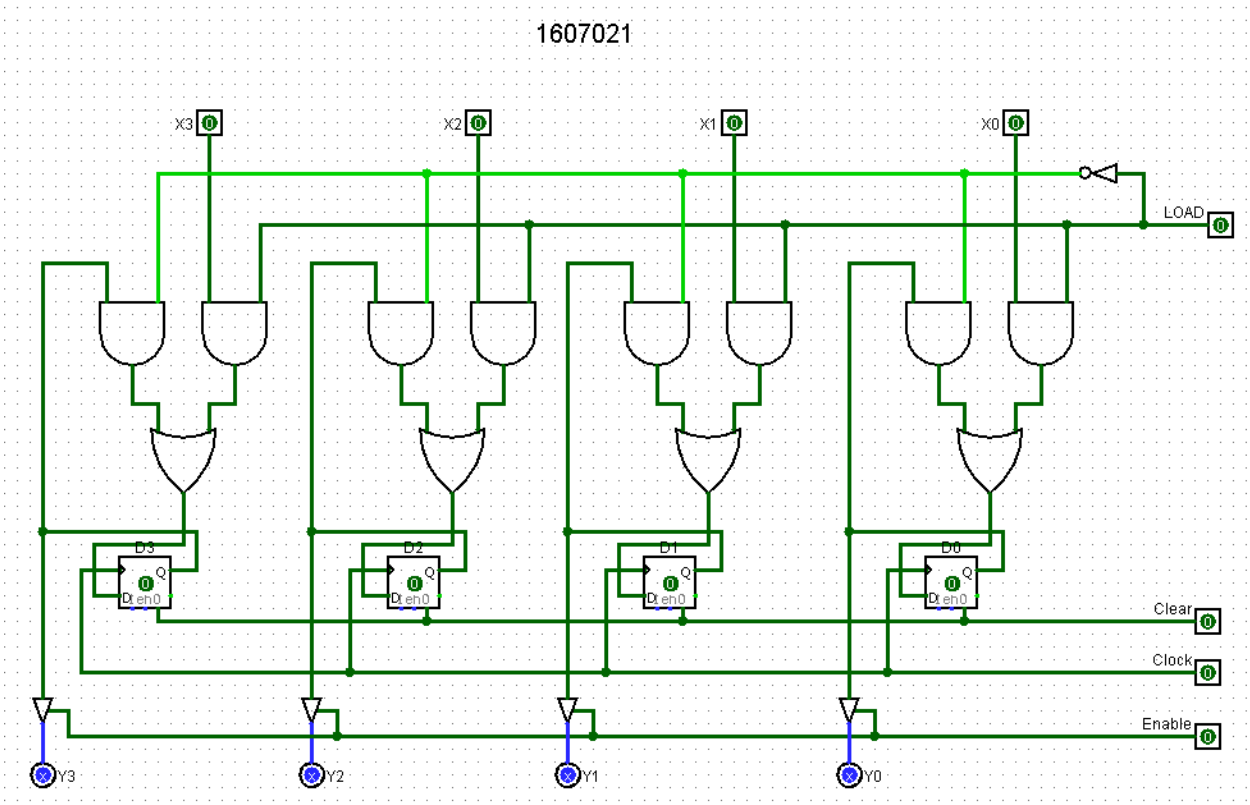

Figure 1: A 4 bits tri-state buffer register.

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Bus: A bus is a group of wires that transmit a binary word. It is a high speed internal connection.

Bus-organised Computer: A bus of 4 wires is a common transmission path between the tri-state registers. The input data bits for register come from the bus, at the same time, the tri-state output of register connects back to the bus. Simply, the other registers have their inputs and output connected to the bus. The beauty of bus organization is the ease of transferring a word from one register to another. To begin with, the same clock signal drives all registers, but nothing happens until applying high controls inputs. In other words,

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as long as all the LOAD and ENABLE inputs are low, the registers are isolated from the bus.

To transfer a word from one register to another, making the appropriate control inputs high. The whole circuit through bus is implemented below:

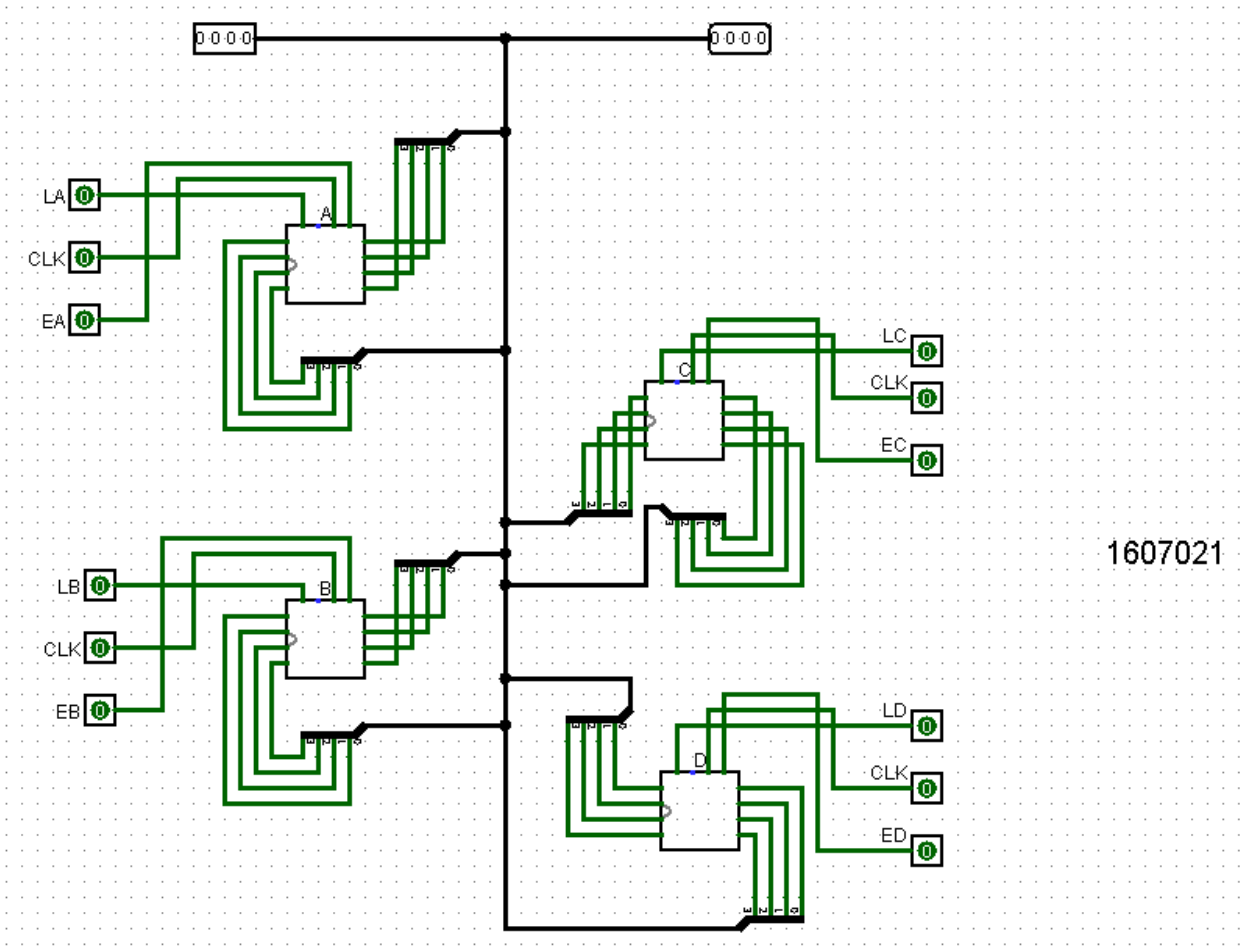

Figure 2: Data transferring from one register to another through bus.

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Discussion: In this laboratory, the experiment of connecting tri-state buffer registers through bus was implemented. In addition, a word of 4 bits obtained from the addition of last 2 digits of my roll number was transferred from one register to another register using bus without any error successfully.