Objective:

(I) To design a register file that is 16-bit wide. Label properly the inputs/outputs/selection.

(II) To design the interfacing for reading data from any of those registers.

(III) To design the interfacing for writing data to any of those registers. make sure it has the write control signal.

Equipments:

(1) Logisim software.

Block Diagram:

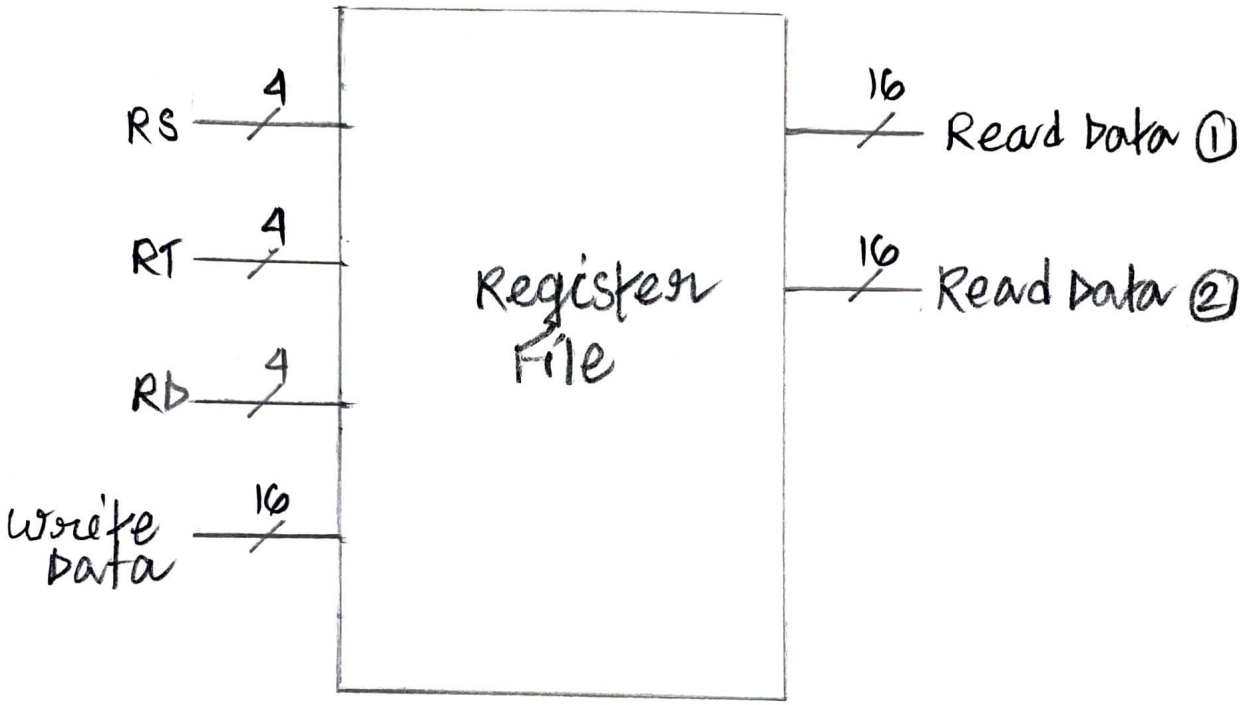

Fig: A 16-bit Register File

Circuit Diagram:

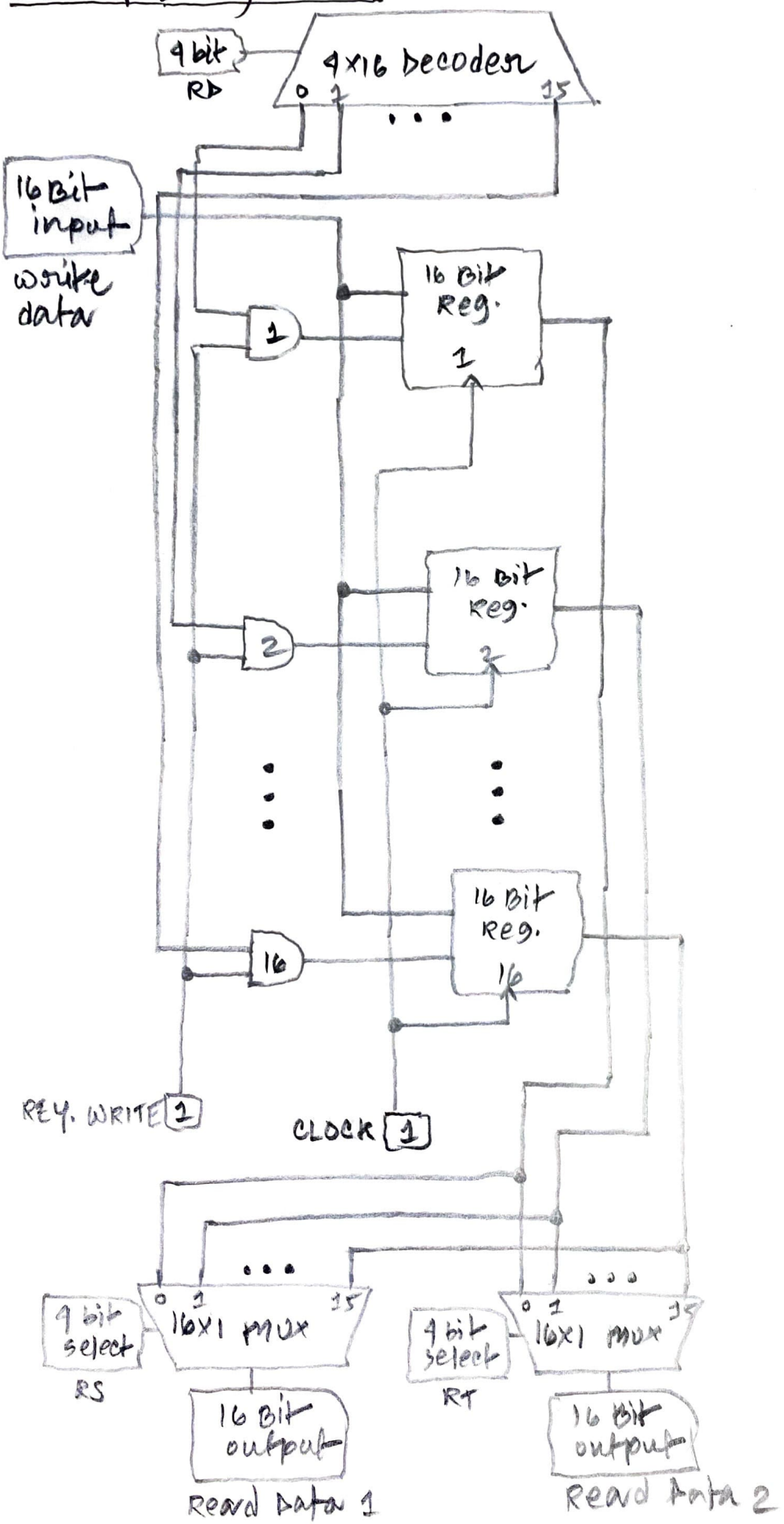

Fig: 16-bit Register File

Discussion:

In this experiment, we needed to design a 16-bit wide register File. For the 16-bit register we were given, RS (source register 1) = RT (source register 2) = RD (destination register) = 4-bits. We needed 4x16 decoder for writing data in one register and we needed 2 muxs (16x1 each) for reading data from two registers. We built the whole circuit in logisim by connecting all the wires carefully from decoder to registers to mux.

This was a pretty easy task to do as there was no hardware implementation so, we built the circuit without any error and got the expected output.