R-Type MIPS CPU

Implementation report

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Question 5.1

We see errors in the instructions from 1 to 31 when we run the second time.

Question 5.2

During the first running we wrote some data to the registers, and in the end of the first running we don’t reset the values of the registers.

During the second running, when we compare the GPR file values in registers where we didn’t write we expect see the value 0, but because of first running the register can contain a non-zero value, as a result we will get an error. As we said before, the reason is that we don’t reset the registers after first running.

Question 5.3

To solve this problem, we can define the register of 32 bits, where every bit represents the activity on every register. If during the running we wrote to some register r, we change the bit in the index r to ‘1’.

When we compare the data, first we will check the values of the helper register. If the value of the r’s bit is ‘0’, we will return 0, else we will return the value of the GPR file.