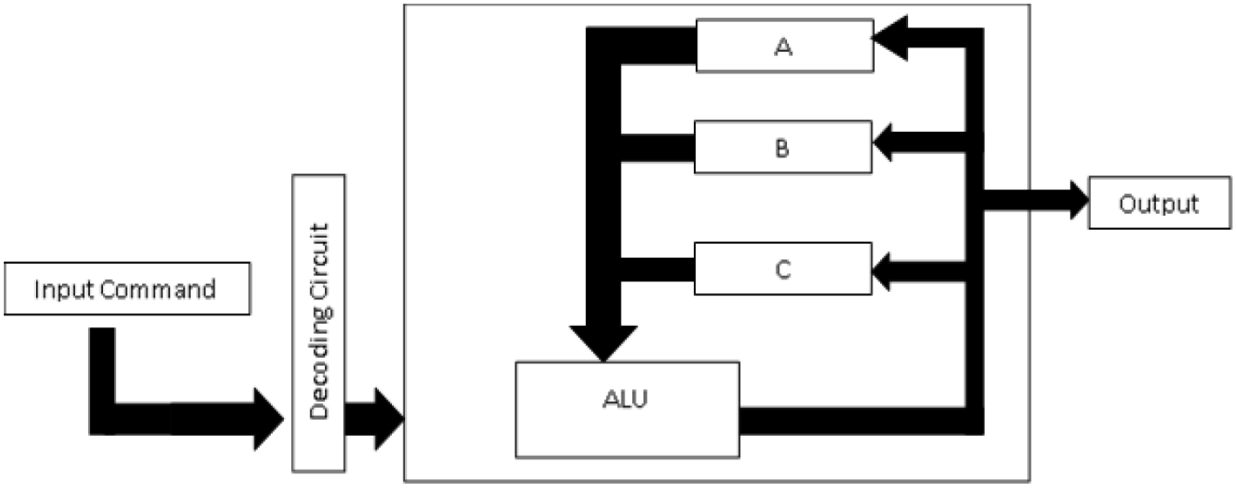


Figure 1: EU Block Diagram

Using the simulation program (*Altera Quartus*), it is required to make an execution unit that able to do the following commands:

- Move Value to Register (Result will be in Register)
- Move Register1 to Register2 (Result will be in Register2)
- Add Value to Register (Result will be in Register)
- Add Register1 to Register2 (Result will be in Register2)
- AND Value to Register (Result will be in Register)
- AND Register1 to Register2 (Result will be in Register2)

Assume that:

1. All registers are 4 bits
2. ALU is able to make three operations
    a. Pass one of operands
        i. 00: Pass the first operand
        ii. 01: Pass the second operand
    b. Add two operands
        i. 10: Add the two operands
    c. AND two operands
        i. 11: AND the operand
3. Make any extra assumptions you need.

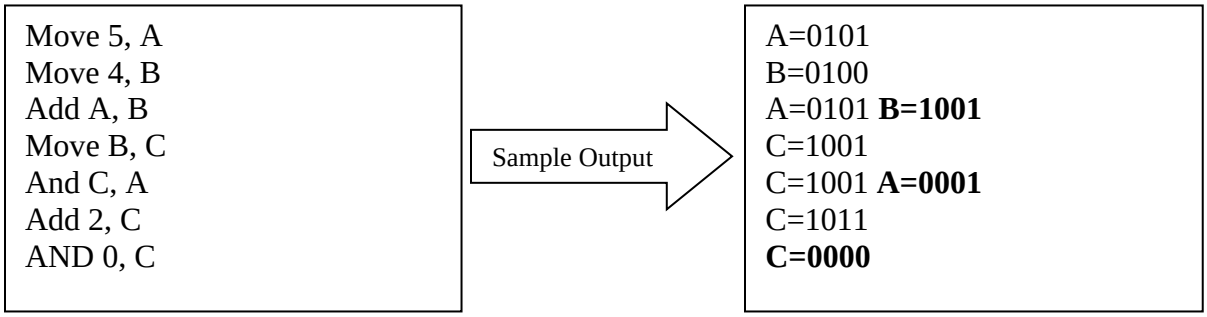
1. How many commands does the execution unit have?

2. How many bits are required for the user input command?

3. How many forbidden input commands do execution unit have? Give an example.

<u>Requirements:</u>

1- Create a schematic file and implement the ALU operation
2- Create another schematic file for EU and use the ALU as a component
3- Create a waveform editor file and set a test scenario as in the following figure:



4- Compile and simulate your design

Deadline and submission rules:

- Save screenshots for the waveform test results.
- Add a file "answers.txt" containing answers to the above 3 questions.
- Compress all project files , "answers.txt" and the screenshots into a single file with name: "student name.zip"
- Send this compressed file to sandrawahid@hotmail.com
- Use the following email subject: "[Micro][SEM] Assign1#Student Names".
- Due is 14 Oct. 2019 at 9:00 a.m.
- Discussion will be held at section time.