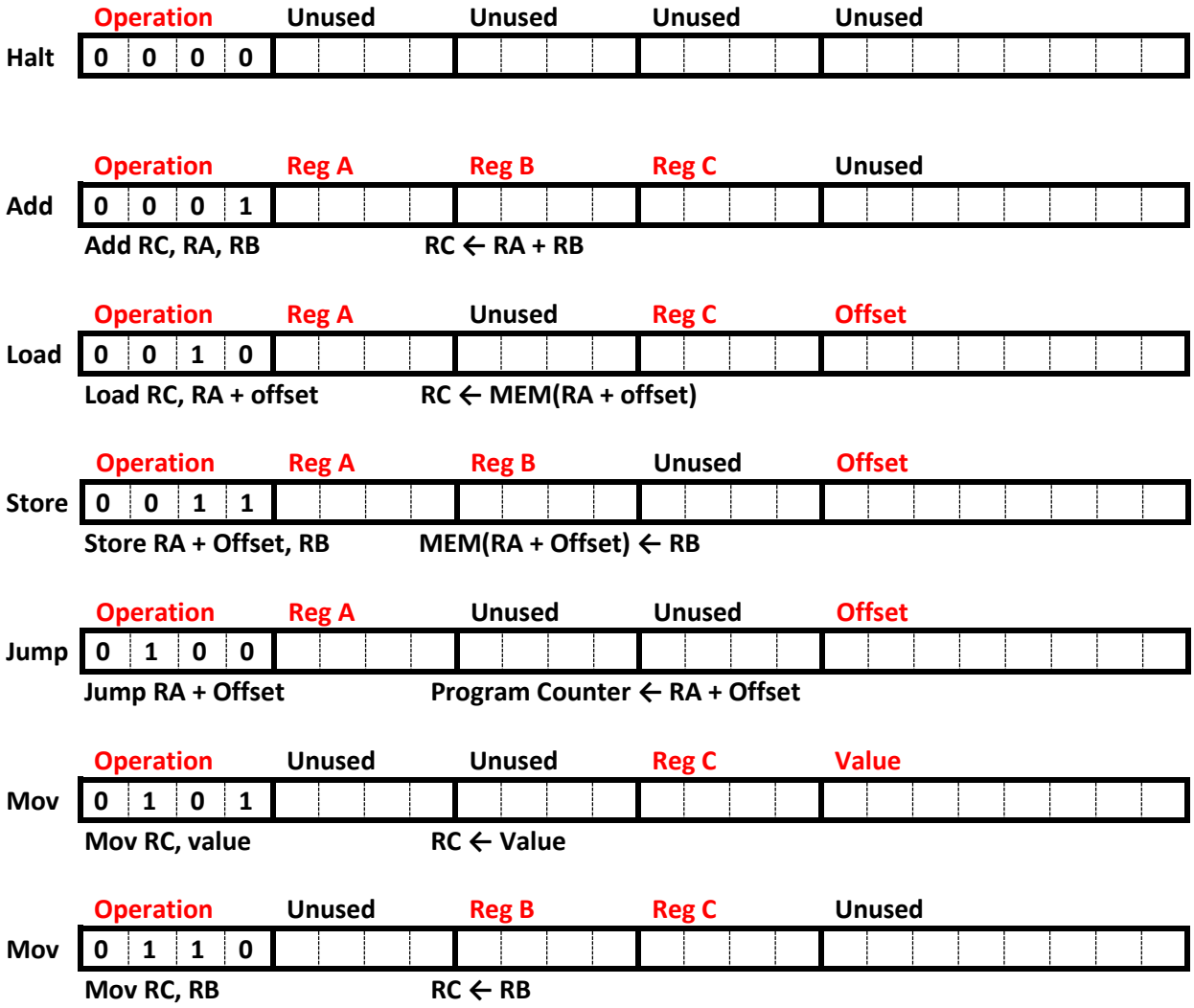
Laboratory 7 (100 Points)

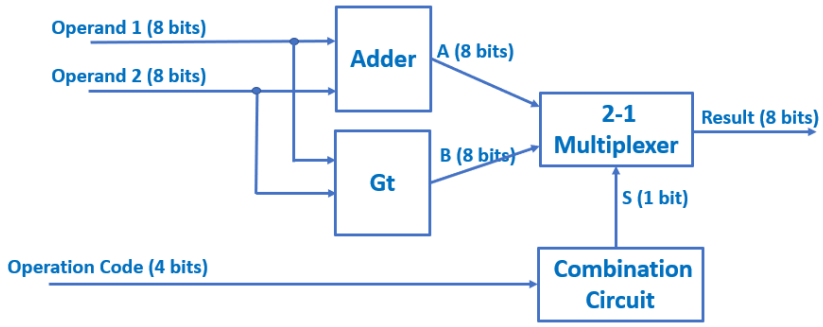
The file **computer.pdf** illustrates the block design of a simplified computer (a simple CPU, instruction RAM, and data RAM).
Each instruction occupies twenty-four bits.

The following figure lists the format for each instruction of our simplified computer.



Assignment 1 (100 Points)

Processors should have a separate hardware unit to perform all arithmetic operations (except the incrementing in the program counter). Our design contains a simple Arithmetic Logic Unit (ALU). The simple ALU has three inputs: operands 1 and 2, and the operation field. Operand 1 and 2 are 8-bit inputs and the operation field is a 3-bit input. This ALU also has one 8-bit output, which is the result of the computation.



1. Design the ALU that can perform 8-bit addition operation to implement the Add instruction.
2. Design a new instruction named GT (greater than). This instruction performs an 8-bit greater-than comparison. Add a new function in the ALU to implement the new instruction.