

## Inside the Computer Practice questions

1. Sketch out the values in data memory, instruction memory, the registers and the program counter after **each instruction** is executed. Assume that the first instruction is at memory location 1500 and that we are using a 32 bit machine. Also assume that memory location 8520 starts out containing the value 4 and memory location 8521 starts out containing the value 2.

You should look at the slides from the Inside the Computer unit to see how to sketch the CPU (starting on the 35<sup>th</sup> slide labelled “Initial Configuration”).

Note that if you were asked this question on a quiz or exam, I would provide the diagrams for you to fill in.

- **load 0, 8520**
- **load 1, 8521**
- **add 0, 1, 0**
- **store 0, 8520**

What does this program do?

2. Use the given table for a NAND gate (below left) to design the circuit described by the table below (below right).

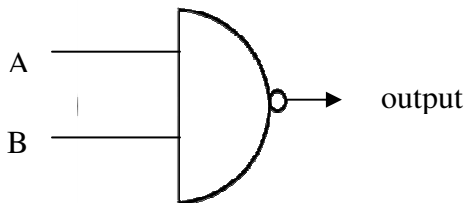
NAND Gate

| Inputs |   | Output |
|--------|---|--------|
| A      | B | NAND   |
| 0      | 0 | 1      |
| 0      | 1 | 1      |
| 1      | 0 | 1      |
| 1      | 1 | 0      |

Circuit

| Inputs |   | Outputs |   |
|--------|---|---------|---|
| A      | B | C       | D |
| 0      | 0 | 0       | 0 |
| 0      | 1 | 0       | 0 |
| 1      | 0 | 1       | 0 |
| 1      | 1 | 1       | 1 |

Remember that NAND gate looks like this:



Please draw your answer below. Use a blank page for your scratch work.

