

## **The human computer Role-sheet: Register**

**You're a register.** A register is a special kind of memory. Like in any memory, numbers can be placed or read in a register. The computer can be instructed to "put the number 123 into the register" or to "add a number to the number that is in the register and put the answer into the register". The information stored in register may represent practically anything: letters, numbers, but also computer instructions. Since the CPU does not differentiate between different types of information, it is up to the software to give significance to what the register sees as nothing but a series of numbers.

A register are a special memory that can be read and written to much more rapidly than the main memory area. There are typically between two and one hundred registers in a computer, depending on its type. Registers are used for the most frequently needed data items to avoid having to access main memory every time data is needed. Since data is constantly being worked on, reducing the need to access main memory (which is often slow) greatly increases the computer's speed.

The program counter is used by another part of the computer, the control unit, which reads from it and writes into it.

### **Preparation:**

- Initial value: the initial value of the register is the value "0000 1110". Write down this number as a hexadecimal number on a piece of paper.
- Modifications will be made in the register by other parts of the computer. For instance, the above value will be changed to contain the result of a calculation. The person role-playing the register is responsible to keep track of her/his own value. Write your current value on a piece of paper, and be ready to erase it and replace by a new value at any time.
- Every thing in the computer is stored as hexadecimal values. Every value that the control unit reads from the register should be a hexadecimal value. Everything that the control unit writes in the register should be a hexadecimal value. Good news: you don't have to decode anything (nearly). If you give hexadecimal values 0B to the control unit, you don't need to

realize this number is decimal value 11. The control unit will handle this number to, say, add it with something else – it is its problem, not yours.