Réalisation des processeurs Nono-1 et Nono-2

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# Introduction

Ce projet consiste en l’implémentation d’un processeur 8 bits, et cela à l’aide du logiciel Logisim.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | isJMP | regWrite | isLoad | ctrlUAL |
| 0000 | 0 | 1 | 0 | 000 |
| 0001 | 0 | 1 | 0 | 001 |
| 0010 | 0 | 1 | 0 | 010 |
| 0011 | 0 | 1 | 0 | 011 |
| 0100 | 0 | 1 | 0 | 100 |
| 0101 | 0 | 1 | 0 | 101 |
| 0110 | 0 | 1 | 0 | 110 |
| 0111 | 0 | 0 | 1 | 111 |
| 1000 | 0 | 0 | 0 | 111 |
| 1001 | 1 | 0 | 0 | 111 |
| 1010 | 1 | 0 | 0 | 001 |
| 1011 | 1 | 0 | 0 | 001 |
| 1100 | 1 | 0 | 0 | 001 |
| 1101 | 1 | 0 | 0 | 001 |
| 1110 | 1 | 0 | 0 | 001 |
| 1111 | 1 | 0 | 0 | 001 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **0000** | **0001** | **0010** | **0011** | **0100** | **0101** | **0110** | **0111** | **1000** | **1001** | **1010** | **1011** | **1100** | **1101** | **1110** | **1111** |
| **add** | **0000** |  | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| **sub** | **0001** |  | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 0 | 00 | 00 |
| **or** | **0010** |  | 00 | 00 | 00 | 00 | 00 | 00 | 00z | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| **and** | **0011** |  | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| **not** | **0100** |  | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| **shl** | **0101** |  | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| **shr** | **0110** |  | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| **li** | **0111** |  | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| **halt** | **1000** |  | 01 | 01 | 01 | 01 | 01 | 01 | 01 | 01 | 01 | 01 | 01 | 01 | 01 | 01 | 01 | 01 |
| **b** | **1001** |  | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** | **10** |
| **beq =** | **1010** |  | 00 | 00 | 00 | 00 | **10** | **10** | **10** | **10** | 00 | 00 | 00 | 00 | **10** | **10** | **10** | **10** |
| **bne !=** | **1011** |  | **10** | **10** | **10** | **10** | 00 | 00 | 00 | 00 | **10** | **10** | **10** | **10** | 00 | 00 | 00 | 00 |
| **bge >=** | **1100** |  | **10** | 00 | 00 | **10** | **10** | 00 | 00 | **10** | **10** | 00 | 00 | **10** | **10** | 00 | 00 | **10** |
| **ble <=** | **1101** |  | 00 | **10** | **10** | 00 | **10** | **10** | **10** | **10** | 00 | **10** | **10** | 00 | **10** | **10** | **10** | **10** |
| **bgt >** | **1110** |  | **10** | 00 | 00 | **10** | 00 | 00 | 00 | 00 | **10** | 00 | 00 | **10** | 00 | 00 | 00 | 00 |
| **blt <** | **1111** |  | 00 | **10** | **10** | 00 | 00 | **10** | **10** | 00 | 00 | **10** | **10** | 00 | 00 | **10** | **10** | 00 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Valeur** | **Instruction** | **Zero Flag** | **Sign Flag** | **Overflow Flag** |
| **1010** | **beq** | 1 | X | X |
| **1011** | **bne** | 0 | X | X |
| **1100** | **bge** | X | 1 | 1 |
|  |  | X | 0 | 0 |
| **1101** | **ble** | X | 1 | 0 |
|  |  | X | 0 | 1 |
|  |  | 1 | X | X |
| **1110** | **bgt** | 0 | 0 | 0 |
|  |  | 0 | 1 | 1 |
| **1111** | **blt** | X | 0 | 1 |
|  |  | X | 1 | 0 |