RISCV-32I CPU

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# ARCHITECTURE OVERVIEW

# REGISTER FILE

The Register File, often referred to as the *RegFile* is a block a quick-access memory. It holds 32, 32-bit words, each of which support reading and writing.

# ARITHMETIC & LOGIC UNIT

The Arithmetic & Logic Unit (ALU) is the section of the CPU designed for mathematical and logical operations. This simple ALU can perform two math operations, addition and subtraction, as well as three logic operations, AND, OR, and XOR. In addition to computing the result given two operands and a specific operation, the ALU also provides five status outputs which are described in *Table 1*.

#### Table 1. Status Output Line Descriptions

|  |  |  |
| --- | --- | --- |
| Status Index | Line | True Condition |
| 0 | Carry | When there is a carry out during addition |
| 1 | Odd Parity | When the number of true bits in result is odd |
| 2 | Zero | When the result is equal to zero |
| 3 | Negative | When the most significant bit of the result is true |
| 4 | Overflow | When addition breaks integer rules. Ex: two negatives add to a positive |