* Topic - How the ALU computes
* An ALU (Arithmetic and Logic Unit) is the "mathematical brain" of a computer that performs calculations and logical operations.
  + Arithmetic unit handle all numeric operations in computer
* The simplest adding circuit is a "half adder" that adds two binary digits and produces a sum and carry bit.
* A "full adder" is a more complex circuit that adds three binary digits and handles the carry bit.
* An 8-bit ripple carry adder adds two 8-bit binary numbers by connecting half and full adders in a chain.
  + ​​If there is a carry into the 9th bit, it means the sum of the two numbers is too large to fit into 8-bits. This is called an overflow.
  + So if we want to avoid overflows, we can extend our circuit with more full adders, allowing us to add 16 or 32 bit numbers, at the cost of speed
  + Modern computers use a slightly different adding circuit called a ‘carry-look-ahead’ adder which is faster, but ultimately does exactly the same thing-- adds binary numbers
* The arithmetic unit of an ALU also performs other math operations, such as subtraction and incrementing, by combining logic gates.
* The logic unit of an ALU performs logical operations, such as AND, OR, and NOT, and tests numerical conditions.
* ALUs use flags to indicate specific statuses, such as zero, negative, and overflow, which are used to control program execution.