1 Activity 1 - Control Bits

Looking at the picture of the CPU on the slides, notice that there are many
control bits (see the list below). Determine the correct control bits for the
following instructions: add, sub, and, addi, lw, sw, slt

The control bits are:

- **ALU op**
  2 bits, controls the ALU operation

- **bNegate**
  Enables subtraction in the ALU

- **ALUsrc**
  Decides what goes into ALU input b

- **MemWrite**
  If 1, we are writing a word to memory

- **MemRead**
  If 1, we are reading a word from memory

- **MemToReg**
  Chooses whether the value sent back to the registers comes from the ALU
  or the memory

- **RegDst**
  Chooses which field of the instruction (rd or rt) is interpreted as the
  destination register

- **RegWrite**
  If 1, then a register will be updated

- **Branch**
  If 1 (and the ALU sets the 'Zero' output), then we will branch to \( \text{PC} + 4 + \text{imm(extended,shifted)} \).

- **Jump**
  If 1, then we will jump.