# Testing

* In General
  + We compared our results with MARS mips simulation to test if the code gives correct output and is handling MIPS instructions correctly
* Decoding:
  + Applied HW2 and previous knowledge from CSE31.
  + Bitwise operations to get the correct bits into the D struct.
  + R format straight-forward, I format check if negative integer. J format simple.
  + At the end, D struct holds the correct values into the registers.
* Executing:
  + Switch cases for different formats and operations.
  + Based on function/op, execute the appropriate math.
  + After, return that value to be sent to the next stage.
* Memory:
  + Check if the instruction is either store word or load word
    - If Instruction is store word
      * Set \*changedMem = val since we are changing a value in the memory
      * Calculate the desired memory by adding the immediate \* 4 to to the memory address provided in the rs register in the sw instruction
    - If instruction is load word
      * Set \*changeMem = -1 since we are not changing any values in the memory
      * Calculate the target address for the read memory the same way we calculated the target memory for store word.
    - Otherwise
      * Return the unmodified val and set \*changeMem = -1
* RegWrite:
  + Depending on the Format, changedReg holds the correct register to change.
  + R format, rd
  + I Format, rt
  + J format, none.
  + If chnagedReg is -1, no changed registers will be printed.