Homework #1: Abstractions and Introduction to MAL


2. Explain how a high-level language differs from assembly from machine language.

3. Draw a simple flow chart of the instruction fetch / execute cycle for the MAL command: add $t0,$t1,$t2 # simple add instruction

4. Describe and define the three different addressing modes used in MAL
5. Draw a simple flow chart for a procedure to take two numbers in $a0 and $a1 and return the result of division in $v0, and the remainder in $v1.

6. Write the MAL procedure described in (5).

7. Assume that the instruction fetch, operand load, or storage of a result takes 10 time units to complete. Instruction decode, operation execution, and program counter update each take 1 time unit to complete. How long does it take to execute the following code sequence:

   add $t0,$t1,$t2   # add two registers, store in third
   sub $t3,$t4,$t5   # subtract two registers, store in third