



Universidad de Puerto Rico – Mayaguez
Department of Electrical and Computer Engineering

INEL 4206 – Microprocessors

Practice Problems

1. Write a recursive procedure¹ to compute and return the greatest common divisor (GCD) of 2 integer arguments. First write the procedure in a HLL and then compile the HLL code to MIPS assembly. The GCD can be defined recurrently as:
 - a. $\text{GCD}(a, b) = b$ if b divides a
 - b. $\text{GCD}(a, b) = \text{GCD}(b, r)$ otherwise, where $r = a \text{ MOD } b$
2. Write a procedure called *precision()* with no arguments. The procedure must return the smallest floating point number that can be added to 1 such that the result of the sum is different from 1.
3. Write a procedure *roots(a,b,c)* that receives the three float coefficients of a polynomial and returns an integer representing the number of distinct real roots.
4. Write a procedure *sin(x)* that takes one float argument representing an angle in radians. The procedure should return the approximated floating point value of *sin(x)* by computing the sum of a Taylor series.

Remember to read Chapters 3 and 4 of Patterson and Hennessy!

¹ In all problems provide answers in both High Level Language and Assembly Language