# Homework Assignment #3 – MIPS Loops

*NOTE: Please test your programs on the simulator.*

⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

1. (50 points) Write a complete program to detect if binary pattern “111” exists in $t0. If yes, $t1 should be 1 and otherwise 0.

For example, if $t0 is 28 in decimal, which is 00011100 in binary in 8 bits (all leading 24 bits are 0 so not shown here), pattern “111” exists; if $t0 is 18 in decimal, which is 00010010 in binary in 8 bits, the pattern does not exist.

 .text

 .globl main

main: ori $t0, $0, 28

 # add your code here

done: li $v0, 10

 syscall

1. (50 points) Write a program to find the difference between the top 2 largest numbers in an array. The starting address of the array is in $s0, and the number of elements in the array is in $s1.

 . data

A: .word 90, 2, 93, 66, 8, 120, 121, 11, 33, 9

 .text

 .globl main

main: la $s0, A

 li $s1, 10

 # add your code here

done: li $v0, 10

 syscall