**CST 250 - Homework 1**

1. A C code program will produce the same machine code program (the same pattern of ones and zeroes) for every CPU or processor architecture.
   1. True
   2. False
2. Explain why the MIPS architecture is referred to as a “Load/Store Architecture”.

The instructions available in MIPS when working with memory are only load and store.

1. Compare and contrast the directive “.space 4” and the directive “.word 4”.

The “.space 4” is preparing 4 bytes since a single “.space” is 1 byte. This is the same size as a single “.word”. The “.word” is preparing 4 “.words” which would be the same size as 16 ”.space”

1. State the value of **t0** after the following code fragment executes.

## li zero, 0x0FFFFFFF

**addiu t0, zero, 1**

**1**

1. Explain the difference between the add and the addu instructions.

addu is adding unsigned which means it does not use negative numbers so the MSB won’t be used as a flag to indicate a negative number. add is stating that the values could be negative and will use the flag bit to indicate a negative number.

1. Explain the difference between **t0-t9** and **s0-s7** registers in the context of the MIPS register usage convention.

t0-t9 are temporary registers where the value can change when a subroutine is called. s0-s7 are saved registers so that when a subroutine is used the value wont change.

1. Explain the purpose of the **a0-a3** registers in the context of the MIPS register usage convention.

a0-a3 are used to store arguments for a subroutine.

1. Explain the purpose of the **ra** register in the context of the MIPS register usage convention.

Return address (used by function call). Used to store the return address of main.

# The MIPS architecture memory model we **are** **using** operates as:

* 1. Big endian
  2. Little endian
  3. Neither little or big endian

# Both big and little endian

1. What is register **s7**’s register number?

$23