# CIS 351 Sample AL4 Problem Solutions

Fri 31st Oct, 2025

## AL4: Intermediate Assembly

(a) Write an assembly function that will compute the sum of all values in an array. Assume that the location of the array is stored in `$a0` and the length of the array is in `$a1`.

There are many correct answers. Here is one:

```
sumArray:
   li $v0, 0  # sum = 0

   sll $a1, $a1, 2   # turn # of elements into size in bytes
   addi $a1, $a0, $a1  # end of the array
   beq $a1, $zero, endOfLoop
topOfLoop:
   lw $t1, 0($a0)
   add $v0, $v0, $t1
   addi $a0, $a0, 4
   bne $a0, $a1, topOfLoop
endOfLoop:
   jr $ra
```

(b) Write an assembly function that will iterate through an array and change any negative values to 0. Assume that the location of the array is stored in `$a0` and the length of the array is in `$a1`.

There are many correct answers. Here is one:

```
lower_bound:
   li $v0, 0  # sum = 0

   sll $a1, $a1, 2   # turn # of elements into size in bytes
   addi $a1, $a0, $a1  # end of the array
   beq $a1, $zero, endOfLoop
topOfLoop:
```

```
    lw $t1, 0($a0)
    slt $t2, $t1, $zero
    beq $t2, $zero, keepGoing
    sw $zero 0($a0)
keepGoing:
    addi $a0, $a0, 4
    bne $a0, $a1, topOfLoop
endOfLoop:
    jr $ra
```