COMPUTER ARCHITECT LAB WEEK 6

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1)

```
.data
out_string: .ascii "\n result: \n"
msg_simple: .asciiz     "simple sum is: "
msg_nl:     .asciiz     "\n"
list: .word 2, 3, 5, 7, 11, 13, 17, 19, 23, 29
size: .word 10
.text:
main:
   lw         $s0,size
   la         $s1,list
   subi    $s2, $s0, 1
   jal     sumsimple
   la      $a0,msg_simple
   move    $a1,$v0
   jal     showsum
   li      $a0,0
   jal     sumrecurs1
   move    $s4,$v0
   li      $v0,10
   syscall
sumsimple:
   move    $t0,$s0
```

```
    move    $t1,$s1
    li      $v0,0
    j       sumsimple_test
sumsimple_loop:
    lw      $t2,0($t1)
    add     $v0,$v0,$t2
    addi    $t1,$t1,4
    subi    $t0,$t0,1
sumsimple_test:
    bgtz    $t0,sumsimple_loop
    jr      $ra
sumrecurs1:
    subiu   $sp,$sp,8
    sw      $ra,0($sp)
    sw      $a0,4($sp)
    blt     $a0,$s2,sumrecurs1_call
    li      $v0,0
    j       sumrecurs1_done
sumrecurs1_call:
    addi    $a0,$a0,1
    jal     sumrecurs1
    lw      $a0,4($sp)
sumrecurs1_done:
    sll     $t2,$a0,2
    add     $t2,$s1,$t2
    lw      $t2,0($t2)
    add     $v0,$t2,$v0
    lw      $ra,0($sp)
    lw      $a0,4($sp)
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```
    addiu   $sp,$sp,8
    jr      $ra
showsum:
    li      $v0,4
    syscall
    move    $a0,$a1
    li      $v0,1
    syscall
    la      $a0,msg_nl
    li      $v0,4
    syscall
    jr      $ra
```

2)

```
.data
array: .word 1 45 10 72 94 10 17 22 28 40
myarr: .asciiz "1 45 10 72 94 10 17 22 28 40\n"
out: .asciiz "Maximum element: "
size: .word 10
.text
main:
        la $s1, array
        lw $s0, size
        add $t0, $zero, $s0
        li $t5, 0
```

```
        lw $t5, 0($s1)
        la $a0, myarr
        li $v0, 4
        syscall
        li $v0, 4
        la $a0, out
        syscall
        jal maximum
        blt $t2, $t5, fact1
        sub $t5, $t5, $t5
        add $t5, $0, $t2
        add $a0, $0, $t5
        li $v0, 1
        syscall
        li $v0, 10
        syscall
fact1:
        add $a0, $0, $t5
        li $v0, 1
        syscall
        li $v0, 10
        syscall
maximum:
        addi $sp, $sp, -12
```

```
        sw   $ra, 8($sp)
        sw   $s1, 4($sp)
        sw   $t0, 0($sp)
        bne  $t0, 1, end
        lw   $t2, 0($s1)
        addi $sp, $sp, 12
        jr $ra

end:
        addi $t0, $t0, -1
        addi $s1, $s1, 4
        jal   maximum
        lw   $ra, 8($sp)
        lw   $s1, 4($sp)
        lw   $t0, 0($sp)
        addi $sp, $sp, 12
        lw   $t4, 0($s1)
        blt $t4, $t5, fact
        sub $t5, $t5, $t5
        add $t5, $zero, $t4
fact:   jr $ra
```