15CSE 381 Computer Organization and Architecture

Lab 3

12th July 2019

1 Read and Understand

1.1 Program for Array Sum

```
.data
list: .word 3, 2, 1, 0, 1, 2
result: .asciiz "\n The sum of the array is:""
.text
.globl main
main:
 li $s0, 0
 li $a0, 0
 li $t0, 0
forsum:
  bge $s0, 6, end_forsum
  lw $t1,list($t0)  # Load the number from array
  addu $a0, $a0, $t1 # Compute the sum
  move $t1, $a0
  addi $t0,$t0,4
  addi $s0,$s0,1
  j forsum
end_forsum:
  li $v0, 4
  la $a0, result
  syscall
  move $a0, $t1
  li $v0,1
  syscall   # Print sum
  li $v0,10 # Terminate program
  syscall
```

2 Practice Program

2.1 List the Array

```
.data
list: .word 2, 3, 5, 7, 11, 13, 17, 19, 23, 29
size: .word 10
NL: .asciiz "\n"
.text
.globl main
main:
lw $t3, size
la $t1, list # get array address
li $t2, 0 # set loop counter
prnlp:
beq $t2, $t3, prndn # check for array end
lw $a0, ($t1) # print list element
li $v0, 1
syscall
la $a0, NL # print a newline
li $v0, 4
syscall
addi $t2, $t2, 1 # advance loop counter
addi $t1, $t1, 4 # advance array pointer
b prnlp # repeat the loop
prndn:
li $v0, 10
syscall
```

3 Questions

1. Write MIPS code to find lenth of an array. End of the array is marked by a cell with '0' value.

2. Develop a program for searching a character in a string. Note that when we declare a string in the data section with type *.asciiz*, it's last cell will be zero. Use this property to check the end of the string. Also use **seq** instruction to compare characters.
   You may start the program like:

```
 .data
char: .byte 'b'
vowels: .asciiz "asdfcvbnmk"
```