FIT1008 – Intro to Computer Science
Tutorial 3

Semester 1, 2018

Objectives of this tutorial

- To understand how to implement decisions and loops in MIPS.

Exercise 1

Consider the following Python code:

```
n = int(input("Enter integer: "))

while (n > 1):
    print(n)
    if n % 2 != 0:
        n = 3*n + 1
    else:
        n = n//2
print(n)
```

Translate the above program into MIPS. Try to make your translation as faithful as possible.

Exercise 2

(i) Using Python, code a program that reads in a list of integers and prints the product of the odd elements in the list [1].

(ii) Translate your code to MIPS [2].

[1] It is recommended to use a **while** structure instead of **for** in your loops. This will make your translation to MIPS easier.

[2] For the sake of brevity, assume that the array has been read in, and that a label `list` in the data segment contains the address of the first element of the array

Exercise 3

(i) Write a Python program that reads in a list of integers and determines if the list encodes a palindrome. You can think of each integer as an encoded character.

(ii) Translate your code to MIPS [3].

[3] For the sake of brevity, assume that the array has been read in, and that a label `list` in the data segment contains the address of the first element of the array

Exercise 4

(i) Explain how the instructions **sll** and **sra** can be used to do multiplication and division in special cases.

(ii) Write some MIPS code to show how to use a shift instruction to perform the multiplication $\mathbf{8} \times \mathbf{6}$.