COMP1047 Lab Week 05

1. Write a program in MIPS32 assembly language to read an integer. The program should indicate if the number is odd or even.

2. Implement the following C functions using MIPS32 procedure.

```
int non_leaf (int g, int h, int i, int j){
     int f;
     f = leaf (g+h, i+j);
     return f;
}

int leaf (int m, int n){
     int f;
     f = m-n;
     return f;
}
```

3. Write an MIPS32 program that reads a string from console and then print out the string in its reverse alphabetical order. For example, if the string from user is \Hello", then you should print out \olleH".

   Hint: To read a string from user, you need to allocate a memory buffer (.data space) of appropriate sizes using `.space` directive. For example, the following statement requests 10-byte space of memory space with the starting address as `buffer`.

```
            .data
buffer:     .space 10
```

   The following segment reads a string from console. At the end of the syscall, the string is stored in buffer in data segment.

```
      la $a0, buffer    #buffer address to $a0
      li $a1, 10  #string length to $a1
      li $v0, 8   # read string
      syscall
```

4. For the above question, instead of printing out the reverse order of the string, please change the third character of the string to upper case (assuming it was typed in as lower case) and then print out the string. For example, if the input is \Hello", then change it to \HeLlo" before printing out. Note, you can only use **`lw`** and **`sw`** instructions for data transfer to/from the main memory.

5. Given two integer arrays A and B, in which each integer is represented in 32-bit two's complement format. Assume that A and B are defined as follows.

```
        .data
A:      .word 4  6  12  -8  5
B:      .word 3  2   1   4  0
```

Update B[0]= 2*A[3]+B[4] and then print out all elements in B.