COE 301 / ICS 233 – Computer Organization

MIPS Programming Assignment 2, Term 171

Due date: Sunday 05/11/2017 at 11:59 PM

The following procedure recursively sorts an array of integers. Translate this procedure into MIPS code. Write a main procedure to dynamically allocate an array of **n** integers (**n** is a user input that must be greater than 1), read an array of **n** integers, print the array of **n** integers before sorting, sort the array, and then print the array after sorting. You need to write procedures for reading and printing the array, and pass parameters properly according to the MIPS convention. You can use the **"Allocate Heap Memory"** syscall service number **9** to dynamically allocate an array of **n** integers.

```
void sort (int array[], int n) {
   int maxIndex = 0, temp = 0, index = 0;
   for (index = maxIndex; index < n; index++) {
       if (array[index] > array[maxIndex]) {
           maxIndex = index;
       }
   }
   temp = array[n-1];
   array[n-1] = array[maxIndex];
   array[maxIndex] = temp;
   if (n > 1) {
       sort (array, --n);
   }
}

void read_array (int n, int array[]) {
   // Ask the user to input n integer elements, and store them in array[]
}

void print_array (int n, int array[]) {
   // Display the n elements of array[]
}
```

Submission Guidelines:
All submissions should be done through Blackboard. Submit the source code of the program. Make sure that your program is well written and documented. The program will be graded according to its correctness and documentation. It is your responsibility to make sure that the program works. A program that does not assemble or run will receive zero on correctness. **Copying programming assignment is not allowed. This is individual work. Detected copies will get zero grades. This includes the one who wrote the program and the one who copied it.**

Grading Scheme:

Dividing the program into procedures and passing parameters properly	**[2 points]**
Dynamically allocating an array of *n* integers	**[3 points]**
Reading the array integers and saving them in the allocated array	**[2 points]**
Properly sorting the array **recursively**	**[5 points]**
Printing the array after sorting	**[2 points]**
Program readability and comments	**[1 point]**
Total	**[15 points]**