UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Department of Computer Science
COS132 - Imperative Programming
Practical 5

1 Introduction

Deadline: 16th May, 18:00

1.1 Objectives and Outcomes

This practical will test your knowledge on the flow of information of recursive function call and return.

1.2 Submission

Your marks will only be published after the submission deadline, fitchFork will reflect a mark of zero instead. You will also be provided with one of the following submission feedback: Compilation failed, Abnormal exit status or Submission successful. Only submit the given files (recursion.cpp and makefile) as a compressed archive.

You will have a maximum of 5 uploads for this practical. Submit your code to Fitchfork before the closing time. Students are **strongly advised** to submit well before the deadline as **no late submissions will be accepted**.

1.3 Plagiarism

Copying will not be tolerated in this course. For a formal definition of plagiarism, the student is referred to the COS132 Study guide. If you have questions regarding this, please ask one of the lecturers, to avoid any misunderstanding.

2 Practical Requirements

2.1 Functions

You are required to write a program that makes use of c++ functions to sort values in an array using recursive function call. The program must prompt the user, in one line, for 4 integer values to place in an array. The recursive function must be as follow:

- Name: recursiveSort

- 3 Parameters: int array (Array to be sorted) and 2 int values (array subscripts)
- Return: int array
- Every time the function is called it must print the elements of the array separated by a comma, note the sort algorithm provided bellow.
- You are **not** allowed to make use of any loop structure, doing so will result in a mark of 0.
- The recursiveSort function must implement the following sort algorithm making use of recursive calls rather than loops:

```
for( int itr1 = 0 ; itr1 < 4 ; itr1++ ){
        for( int itr2 = 0 ; itr2 < 4 ; itr2++ ){
                cout <<"itr1:"<< itr1 <<"␣itr2:"<< itr2 << "␣array:";
                cout <<arr[0]<<","<<arr[1]<<","<<arr[2]<<","<<arr[3]<<endl;
                if( arr[itr1] > arr[itr2] ){
                        int temp = arr[itr1] ;
                        arr[itr1] = arr[itr2] ;
                        arr[itr2] = temp ;
                }
        }
}
```

You are provided with a makefile and a file named recursion.cpp. Open and study this file to see it. The file is empty besides the skeleton that you are now used to. No Maths or Sorting libraries are allowed, using will result in a mark of 0.

Example of this is presented below. Please note the wording, spaces and endlines used. They should match the example provided.

```
Enter 4 integer values: 8 1 6 4
itr1:0 itr2:0 array:8,1,6,4
itr1:0 itr2:1 array:8,1,6,4
itr1:0 itr2:2 array:1,8,6,4
itr1:0 itr2:3 array:1,8,6,4
itr1:1 itr2:0 array:1,8,6,4
itr1:1 itr2:1 array:8,1,6,4
itr1:1 itr2:2 array:8,1,6,4
itr1:1 itr2:3 array:8,1,6,4
itr1:2 itr2:0 array:8,1,6,4
itr1:2 itr2:1 array:8,1,6,4
itr1:2 itr2:2 array:8,6,1,4
itr1:2 itr2:3 array:8,6,1,4
itr1:3 itr2:0 array:8,6,1,4
itr1:3 itr2:1 array:8,6,1,4
itr1:3 itr2:2 array:8,6,1,4
itr1:3 itr2:3 array:8,6,4,1
```