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# BLG 322E COMPUTER ARCHITECTURE

## HOMEWORK 3

## Instruction Emulation in MC 68000

In this homework using the instruction emulation capability of the MC68000 two sorting instructions will be implemented. One instruction (`sortasc`) sorts the array in ascending order and the other one (`sortdesc`) sorts the array in descending order. An exception service routine will be implemented for these sorting instructions. You can use bubble sort algorithm as a sorting method, which is provided you in homework 1.

```
for i=1 to arraysize
     for j=1 to arraysize
          if element#j less than element#j+1
               swap elements j and j+1
          endif
     endfor
endfor
```

Instructions which will be implemented start with '$F' and take only one parameter; 16-bit address of the array, which will be sorted. The array contains 8-bit unsigned numbers and terminates with the value '0'. Sample calls of instructions are given as follows.

```
dc.w $f000,0,$2000  ; sortasc  $2000
dc.w $f001,0,$2000  ; sortdesc $2000
```

Instruction calls above are for ascending sorting and descending sorting of the array at address $2000 respectively. You can define the array at address $2000 using following instructions.

```
     ORG $2000
ARR  DC.B  $07, $33, $19, $FF, $00
```

- Write the exception service routine to implement the instructions and the main program to test your service routine. Compile and test your program with the Easy68K simulator.
- Extension of your code files should be '.x68'.
- Don't forget to enable exceptions in Easy68K simulator.

**Submission Date: 16.04.2014, Wednesday, 23:00**

**Submission Type:**

- Program file (with extension .x68) should be submitted through Ninova (http://ninova.itu.edu.tr/).
- Since a report will not be submitted, please add necessary command lines that make your program easily understandable.
- Homeworks should be done individually. Involving plagiarism may result with negative grade.
- Late submissions will not be considered.