School of
Engineering

Newcastle University

EEE2007: Computer Systems and Microprocessors

Lab 5: Review of C/C++ Arrays and Call by Reference

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Exercise I: Serial Data Processing

Recommended Time: 40 Mins Maximum

Aims:

a. To understand how arrays are created dynamically
b. To reinforce call by reference

Follow the instructions below and try to do accordingly-

1. **DOWNLOAD** the source code of Lab5ex1.cpp.

2. **REVIEW** the source code of Lab5ex1.cpp using Notepad++ (Start->type "Notepad++")

   Go through each line to understand how the code is organized. Check the following:
   - How function prototypes are created
   - How pointers are used to declare an array of unknown size
   - How random numbers are generated
   - How call by references are being used

3. **COMPILE** the source code of Lab5ex1.cpp:
   a. Start Cygwin command shell through Start->All Programs->Cygwin->Cygwin Bash Shell
   b. In the Cygwin shell type: *g++ –Wall Lab5ex1.cpp –o Lab5ex1*

      The –Wall option enables all the warnings, and the –o option enables specification of the output executable

      Your compilation should generate an executable called *Lab5ex1*

4. **EXECUTE** the *example1* executable by typing the following in the Cygwin shell
   ./Lab5ex1

5. **OBSERVE** the outputs.

QUESTION: Can you try with different MAX values (change from 100 to some other value of your choice), recompile and re-execute?

Exercise II: Reading Serial Binary by bytes (and converting to Decimal)

Recommended Time: 60 Mins Maximum

Aims:
a. To practice writing codes with call by reference and dynamic array pointers

Modify Lab5ex1.cpp as follows:

1. Make MAX value a multiple of 8.
2. Write two more functions:
   a) A function that will take the serial random binary array and read 8 binary bits as a byte value
   b) From the above function call another function that will convert the byte value to decimals, and print them at the output console.
3. Once you have written both functions, try with different values of MAX and check to see the outputs generated.