

CSCI 2500: Computer Organization

Lab 3 – Exercises

C Programming

1. Write a C program to display entries 32-127 of the ASCII table to standard output (an example of the ASCII table can be downloaded from LMS; Labs → Lab 3 (9/16/2015)). Your output must include the ASCII decimal number, the hexadecimal and octal equivalents, and the character represented. Be sure to include a header row on the output for clarity.

Example Program Output: `./lab3_ex1.exe`

```
dec hex  oct   char
32  0x20 0o40
33  0x21 0o41  !
...
122 0x7a 0o172  z
123 0x7b 0o173  {
124 0x7c 0o174  |
125 0x7D 0o175  }
126 0x7E 0o176  ~
127 0x7F 0o177
```

2. Download lab3_ex2.c from LMS. Add a function to this program called `getArrayStats` that computes the maximum, minimum, and average of the values in the array (a function prototype is provided in the code). Print the average, minimum, and maximum of the initial array values to standard output.

Example Program Output: `./lab3_ex2.exe`

```
Maximum value = 10
Minimum value = 1
Average =      5.5
```

Before the call to function decrement:

```
10  9  8  7  6  5  4  3  2  1
```

After the call to function decrement:

```
9  8  7  6  5  4  3  2  1  0
```

3. Machine Epsilon: Download lab3_ex3.c from LMS. Compile and run this program. Take note of the results. Change the program to use double precision values. Compile and run the program again. What is this program doing?
4. Fix the Bugs: Download lab3_ex4.c from LMS. Compile and run this program. Take note of the incorrect results. Why does the second comparison of variables `x` and `n` evaluates to true? Fix the program to remove the errors.