Systems Programming 1 – 300167

Tutorial and Lab Practice One

This work **will** be marked and is due in your scheduled lab class the week commencing Monday 7th of March, and is worth **4%** of your assessment. You should hand in a hard copy of your answers and demonstrate your programs to your Tutor during your scheduled lab session. **Email submission is not accepted**.

Tutorial

1. Get any book or on line resource on C programming, and read the sections regarding C variables, data types and definitions, and control structures. You are recommended to read Practical Programming in C, Lecture Note 1 and 2, of MIT Open Courseware.

2. Review the terminology introduced and concepts taught in Lecture 1.

3. For the following c program fehtocel.c, convert the `for` loop to a `do ... while` loop. (**1%**)

```
#include <stdio.h> /*print Fahrenheit-Celsius table for
fah=0,10..,200*/

main() {
  int fah, cel;
  int lower, upper, step;
  lower=0;  /*lower limit of the temperature table */
  upper=200;  /* upper limit */
  step=10;  /*step size */
  for (fah=lower;fah<= upper;fah=fah+step)
  {
    cel=5*(fah-32)/9;
    printf(``%d\t%d\n'', fah, cel);
  }
}
```

4. Write the pseudo-code for the following c program fahtocel1.c. (**1%**)

```
#include <stdio.h>
int celc(int);
main()
{
        int temp;

        printf(``\nPlease enter temp F '');
        scanf(``%d'', &temp);

        printf(``\n%dF to centigrade is %dC\n'', temp, celc(temp));
        exit(0);
}
int celc(int f)
```

```
{
        return 5*(f - 32)/9;

}
```

Lab Practice

1. Ensure that your SCEM computer account is active and that you can log in. Log in to Unix/Linux.To compile and run a C program,

   1) use your preferred editor to edit a C program, e.g. MyCProgram.c.
   2) open a Unix/Linux terminal, compile MyCProgram by "cc MyCProgram.c" to generate an executable file "a.out"; or by "cc MyCProgram.c -o MyCProgram" to generate an executable file called "MyCProgram"
   3) run it by typing "./a.out" or "./ MyCProgram"

2. Read Chapter One of the textbook, paying attention to the basic Unix commands.

   This lab practice is to ensure a basic familiarity with the C programming language and the Unix/Linux command language interface (CLI). Your class tutor will assist with explanations where necessary.

   It is assumed that you:

   - can use a Windows style graphical user interface;
   - can use a screen editor;
   - know what a compiler is;
   - understand the concept of a directory structure.

   Unix/Linux provides an on line manual system, accessed through the `man` command. Try and understand the functions of the following Unix commands: `cd`, `cp`, `mv`, `rm`, `ls`, `pwd`, `more` and `cc`.

3. Compile and then run the two programs fahtocel.c and fahtocel1.c given above.

4. Write, compile and run a program which asks users to enter three numbers, and then prints out the largest of the three numbers within the main function. (**1%**)

5. Re-write the above program in Q4 by using a function call to evaluate the largest of the three numbers (Hint: Compare the difference between fahtocel.c and fahtocel1.c). (**1%**)