CS&E 1222

Lab 7 – Formatted Output Lab Assignment – 20 points

- ✓ The *lab* must be accomplished solely by you:
  - ➢ DO NOT look at anyone's code other than your own, including code from another's student in your section or another section of the course, or any third party source, e.g. the Internet
  - ➢ DO NOT share or copy anyone else's code for any graded assignment
  - ➢ DO NOT work in pairs or groups
- ✓ All cases of academic misconduct will be reported to the *Committee On Academic Misconduct* (COAM).

Setting up the Programming Environment

Effective commenting and tabbing will affect your grade. The "style" of your program should follow the style of the sample programs in the lecture notes. Also see the example code from Lab #1. Your program should have the file name, your name, creation and last modification dates and a brief description of the program in the comments. ***In addition, read the document on "Commenting" found in the Content tab on Carmen under "Tutorials"***.

1. At the Linux command line type `mkdir lab7`. This will create a new directory named **`lab7`**. Work out of this directory. In order to do that, type `cd lab7`. This changes the current working directory to the directory **`lab7`**.
2. If you have created the directory **`lab7`**, then just type `cd lab7`.
3. Copy the file **`rootTable_solution.exe`** from the directory **`/class/cse1222/9643/lab7`** into the current directory by typing:

```
cp /class/cse1222/9643/lab7/rootTable_solution.exe .
```

Be sure to include ***9643*** (this is your course section indicator) and the period, ".".

Programming Assignment

Write a program **`rootTable.cpp`** which reads in the number of roots, a value increment, and a precision and outputs a table of roots $x^{1/2}$, $x^{1/3}$, … for the given number of roots and values of x equal to i times the increment up to and including 100.

For instance, if the number of roots is 10, the precision is 2, and the increment is 10, then the table should be:

Value	x^1/2	x^1/3	x^1/4	x^1/5	x^1/6	x^1/7	x^1/8	x^1/9	x^1/10	x^1/11
10	3.16	2.15	1.78	1.58	1.47	1.39	1.33	1.29	1.26	1.23
20	4.47	2.71	2.11	1.82	1.65	1.53	1.45	1.39	1.35	1.31
30	5.48	3.11	2.34	1.97	1.76	1.63	1.53	1.46	1.41	1.36
40	6.32	3.42	2.51	2.09	1.85	1.69	1.59	1.51	1.45	1.40
50	7.07	3.68	2.66	2.19	1.92	1.75	1.63	1.54	1.48	1.43
60	7.75	3.91	2.78	2.27	1.98	1.79	1.67	1.58	1.51	1.45
70	8.37	4.12	2.89	2.34	2.03	1.83	1.70	1.60	1.53	1.47
80	8.94	4.31	2.99	2.40	2.08	1.87	1.73	1.63	1.55	1.49
90	9.49	4.48	3.08	2.46	2.12	1.90	1.76	1.65	1.57	1.51
100	10.00	4.64	3.16	2.51	2.15	1.93	1.78	1.67	1.58	1.52

Run **`rootTable_solution.exe`** to see examples of the program. Your program should behave like this program with the same input and output.

1. Prompt and read in the number of roots. Store the number as an integer.

2. Prompt and read in the value increment. Store the number as an integer.

3. Prompt and read in the precision. Store the number as an integer.

4. Compute the width of each column based upon the precision. All columns after the first should have the same width. All columns should be separated by a blank space. Note that you need a minimum column width to properly display the column headers. However, for greater precision, your column width should increase with the precision.

5. Write a header row for the table. Use the column width to correctly adjust the column headers. Note that you will have to handle columns headers **`x^1/i`** differently when *i* is a single digit ($i < 10$) or when *i* is two digits ($i \geq 10$). You may assume that *i* has at most two digits.

6. Write the rows of the table. The first column is *x*. The *i*'th column is the value of $x^{1/i}$. Use fixed precision and the given number of digits after the decimal point specified by the precision. The decimal points in each column should line up.

7. Be sure to add the header comments "File", "Created by", "Creation Date" and "Synopsis" at the top of the file. Each synopsis should contain a brief description of what the program does.

8. Be sure that there is a comment documenting each variable.

9. Be sure that your *if* statements, *while* loops, and blocks are properly indented.

10. Check your output against the output from the solution executables provided.

Submit Your Work

Important: Any program which does not compile and run will receive no credit!
If you are not sure what this means please ask your instructor.

Submit the files **`rootTable.cpp`** using the *Lab7* drop box on Carmen. **DO NOT** submit the file **`a.out`**. **DO NOT** submit work from other assignments. This will not be graded.