CIS263 Assignment 1 (7% of the final grade)

Due date: 12:00PM on January 22

Maximum Points: 100

(Please finish this assignment individually.)

Part 1. Programming Assignment (50 Points)

Please download the C++ header file "house.h" and C++ source file "main.cpp" from BlackBoard. In this programming assignment, you need to write a separate C++ source file to implement the member functions defined in "house.h". Your separate C++ source file should support the following output when it is compiled along with the "main.cpp" and "house.h", and executed.

House A: unknown -1 -1

Now, House A: White 150000 3

House B: Grey 200000 4

House C: unknown -1 -1

Now, House C: Yellow 180000 3

House D: Red 120000 2

Please do **not** change the "house.h" and "main.cpp". You only need to write a separate C++ source file to meet the requirement. Please finish that based on the definition of member variables and functions shown in the "house.h" and the codes in "main.cpp".

You should name your separate C++ source file as your "last name.cpp" (e.g., "cao.cpp" for my case). When you test your program, please put "house.h", "main.cpp" and your separate C++ source file in the same directory and compile.

If you compile your programs using IDE other than CLion, be sure to enable C++11 compiler option in your IDE. For instance, to compile, using g++ on the command line:

g++ -std=c++11 main.cpp "Your_separate_sourceFile".cpp -o house

./house

"house.h" and "main.cpp" in BlackBoard will be compiled along with your submitted C++ source file in order to test and grade. **Again, do not change "house.h" and "main.cpp".**

Please submit your separate C++ source file to BlackBoard.

Part 2. Questions

Please finish the following questions in hard copy and submit that in January 22's class. You can either write them down in paper or type and print. Please do **not** submit it to BlackBoard.

(15 Points) Q2.1. Order the following functions by growth rate: N, $\sqrt{N}$, N^2, $N\log N$, 37, $N\log(\log N)$, $N\log(N^2)$, 2^N, $2^{N/2}$, $N^2\log N$, N^3. Indicate which functions grow at the same rate.

(20 Points, 10 points each) Q2.2. In a recent court case, a judge cited a city for contempt and ordered a fine of $2 for the first day. Each subsequent day, until the city followed the judge's order, the fine was squared (i.e., the fine progressed as follows: $2, $4, $16, $256, $65,536, . . .).

a. What would be the fine on day N?
b. How many days would it take for the fine to reach D dollars (a Big-O answer will do)?

(15 Points, 5 points each) Q2.3. An algorithm takes 0.5 ms for input size 100. How long will it take for input size 500 if the running time is the following?

a. linear
b. quadratic
c. cubic