Line Project

You are to design a class *Line* that implements a line, which is represented by the formula $y = ax+b$. Your class should store *a* and *b* as double member variables and write a member function *intersect()* such that L.intersect(K) returns the *x* coordinate of the unique point at which lines L and K intersect. If there is not a unique such point, the function should throw an appropriate exception.

Your function should throw an exception if the two lines are the same and hence have an infinite number of common points; or are parallel and hence have no point of intersection. For this, you will need subclasses *EqualLines* and *ParallelLiines* of the class *RunTimeException* (declaration on page 97 of the text). The message part of the exceptions should be "***The lines are equal: infinite intersection***" for *EqualLines* and "***The lines are parallel: no intersection***" for *ParallelLiines.* When either exception is caught, the messages will be printed. This will occur in the program that uses the Line class. The class methods should not produce any output.

You will be provided two files: *line.h* containing the declarations for all the needed classes; and a partially completed file *line.cpp* where you should provide the implementation of the *Line* class . You are to submit only the *Line.cpp* file.

In a separate file, you should create a test program that creates a number of Line objects and tests each pair for intersection. You should use this program to test your classes. Do not submit this file.