

C++ Homework 09

1. Write a POD class "TRADE_DATE" to store a period of time with the following member variables:
 - 1.1. int ID;
 - 1.2. tuple <int, int, int> begin_date
 - 1.3. tuple <int, int, int> end_date
 - 1.4. int duration; //the number of days in this period
2. Write a random TRADE_DATE generator, which can generate 100,000 TRADE_DATE objects and store in a container
 - 2.1. note that the duration should be positive value between 1 to 10 days for each object. And all the year is between 1900 to 2000 A.D.
3. Write a template class "intersection_finder"
 - print out all the TRADE_DATE objects that have overlaps
 - first, sort all the objects according to the begin_date with the std::sort, with the following predicates (write and test all of them)
 - an operator < in the class
 - an additional functor
 - an lambda function
 - second, use std::lower_bound/std::upper_bound to probe the possible intersection each object one after one:
 - For example:
 - auto low=std::lower_bound (v.begin(), v.end(), a);
 - auto up= std::upper_bound (v.begin(), v.end(), a);
 - check all objects in the range between "low" and "up", and calculate the length of the overlapping days
 - The result should look like:
 - TRADE_DATA ID: X overlaps with TRADE_DATE ID: Y by Z days.
 - print out the date of X and Y to validate by eye examination
4. Use std::bind to create std::function that can print out all intersection of a TRADE_DATE object in the vector
 - 4.1. std::function < void(TRADE_DATE) > new_function = bind (intersection_finder, ...);