**SOA & the ProductService: Homework**

**MTH 9815: Software Engineering for Finance**

Note: Please use the C++ coding standards as specified in the following guide:

<https://google.github.io/styleguide/cppguide.html>

**DUE DATE: TUESDAY, DECEMBER 11, 2018 at 6pm**

Please reach out to me on the forum should you have any questions. You can complete this homework in the groups assigned by Alain. Please submit via a repo on bitbucket or GitHub that you share with Alan (ID alancoman). Note that sample code in products.zip is also attached to the homework thread on the forum and will need to be used for this homework.

**EXERCISE 1**

Write a program to publish an int between two C++ programs using shared memory. Google how to use Boost.Interprocess to do this! Ask questions on the forum if you are stuck.

**EXERCISE 2**

Write a Future class in the same way we have a Bond and IRSwap class (products.zip attached to the homework thread on the forum). Also write a FutureProductService like a BondProductService and IRSwapProductService with an example test program to retrieve three futures.

Also add EuroDollarFuture and BondFuture as subclasses of Future.

**EXERCISE 3**

Write the following utility method on the BondProductService to search for all instances of a Bond for a particular attribute:

// Get all Bonds with the specified ticker

vector<Bond> GetBonds(string& \_ticker);

Write the following utility methods on the IRSwapProductService to search for all instances of an IRSwap for a particular attribute:

// Get all Swaps with the specified fixed leg day count convention

vector<IRSwap> GetSwaps(DayCountConvention \_fixedLegDayCountConvention);

// Get all Swaps with the specified fixed leg payment frequency

vector<IRSwap> GetSwaps(PaymentFrequency \_fixedLegPaymentFrequency);

// Get all Swaps with the specified floating index

vector<IRSwap> GetSwaps(FloatingIndex \_floatingIndex);

// Get all Swaps with a term in years greater than the specified value

vector<IRSwap> GetSwapsGreaterThan(int \_termYears);

// Get all Swaps with a term in years less than the specified value

vector<IRSwap> GetSwapsLessThan(int \_termYears);

// Get all Swaps with the specified swap type

vector<IRSwap> GetSwaps(SwapType \_swapType);

// Get all Swaps with the specified swap leg type

vector<IRSwap> GetSwaps(SwapLegType \_swapLegType);