ALGORITHMIC TRADING TESTING PLATFORM

1 Overview

The Algorithmic Trading Testing Platform allows users with little IT background to back-test algorithmic strategies. This is now described in more detail.

1.1 Overall functions

The platform provides the following functions for a user:

- Ability to specify which Sirca orderbook file will be used during testing
- Ability to choose and configure a particular algorithmic trading strategy
- Ability to run the strategy and get feedback about its performance

These functions should be provided through a user friendly and integrated GUI.

1.2 Functional requirements

Id	Functional requirement	Comments
1	Reading a correctly formatted Sirca orders file (1 day only)	See "Introduction to orderbooks" document
2	Choosing an appropriate algorithmic trading strategy and setting its different parameters	Start with giving the user the ability to choose "Momentum Strategy". Other strategies can be added later.
3	Generating algorithmic orders for 1 particular day	
4	Evaluating algorithmic orders and providing feedback to user	This is explained in detail in section 2 of this report
5	GUI functions to visualise market data (spread, volume and depth) as well as when orders are made	

1.3 Quality requirements

Id	Quality requirement	Comments
1	Speed of execution	
2	Usability of the GUI	
3	Quality of the visualisation	
4	Quality of strategy performance report	

2 Trading strategy evaluation

When invoking an algorithmic trading strategy, a file containing *algorithmic orders* is generated. Such a file indicates at which time particular buy and sell orders should be made.

Evaluating a trading strategy analyses the content of this file as well as the original orderbook file. It can be done in several ways which involve 2 simple steps:

1 Turning orders into trades

2 Evaluating returns from trades

2.1 Turning orders into trades

There are two options which should be available to the user from the GUI:

- Option 1 [Immediate Execution]: all orders are immediately transformed into trades. This means that a user wanting to buy 100 shares at $2 will always succeed in making a trade regardless of whether there is supply of shares at that price or not. This is of course not very realistic but helps getting something up and running very quickly
- Option 2 [Execution with No Impact Analysis]: an order will only execute if there is an opposite order. This means that you need to keep track of the orderbook status all the time from the orderbook file. Information on how to do that will be posted on the course's web site. This means that an algorithmic order will not always execute.
- Option 3 [Execution with Impact Anlaysis]: same as Option 2 but with impact analysis (i.e. algorithmic trades affect future input orders). This is complicated and details will be provided on request after the two previous options have been implemented.

After this phase, a number of *algorithmic trades* are available for evaluation in the next phase.

2.2 Evaluating trades

We start looking at the list of algorithmic trades and we detect the first buy/sell trade pair (i.e. a buy trade followed by a sell trade). The payoff is simply Price(sell)-Price(buy). This is also expressed as a return in percentages terms Price(sell)-Price(buy)/Price(buy). So if there are two algorithmic trades, Buy at 2.50 and Sell at 2.75, the payoff is 0.25 and the return is 10%.

The same can apply to a Sell/Buy pair (called short-selling) where the return is Price(sell)-Price(buy)/Price(sell). For example, if you sell at $2.50 and buy at $2.45, the return is 2%.

The performance of a strategy consists of adding all returns. For example, if we had the following list of trades:

Buy@2.50, Buy@2.60,Buy@2.65,Sell@2.60,Sell@2.55,Buy@2.50,Sell@2.45,Sell@2.60,

Sell@2.50,Buy@2.45

The corresponding list of returns would be:

Buy/Sell pair	Return Calculation	Return Value
Buy@2.50, Sell@2.60	2.60-2.50/2.50	4%
Buy@2.60, Sell@2.55	2.55-2.60/2.60	-1.9%
Buy@2.65, Sell@2.45	2.45-2.65/2.65	-7.5%
Buy@2.50, Sell@2.60	2.60-2.50/2.50	4%
Sell@2.50,Buy@2.45	2.50-2.45/2.50	2%
TOTAL GAIN/LOSS		**0.6%**

In this case, a total gain of 0.6% was made.