TradeSim®

Advanced Trading Simulator and Back Tester

Application Note 6

Provisional Trades and Signal Ranking using TradeSim

- ✓ TradeSim Standard, Professional, Enterprise Editions
- ✓ Metastock Version 7.xx and above
- ✓ TradeSim Version 6.4.0 and above
- ✓ Metastock/TradeSim plugin to Metastock Version 8.3.0

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Contents

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Introduction

Starting with Version 6.3.2 Beta version of TradeSim we have included Provisional Trades. An extra status flag CE (Confirm Entry) has been added to each trade in the trade database, which denotes confirmation of trade entry. This allows trade signals to be generated and TradeSim treats these as prospective trades where orders are put into the market and depending on whether or not the CE bit is asserted the trade will actually mean the trade is filled or not filled. Discarded trades are shown in the Trade Log as a trade entry with yellow text on a gray background. There is no corresponding trade exit in the log because the trade was never filled.

The provisional trades with CE=false are removed after all entries on the same date/(time) have been considered which may include other provisional trades with CE=false or accepted trades with CE=true. Trades with CE=true are treated as trades which have been accepted by the market and treated as complete trades with entry and exit conditions shown in the Trade Log as in previous versions of TradeSim. However even with CE=true these trades may still be rejected because of capital restraints etc. This means that no order was ever placed. When Provisional Trades has been switched off in the Trade Parameters then the CE bit is ignored and all trades are treated like they were in previous versions of TradeSim. That means the trades will be taken if available trading capital permits.

Using Provisional Trades along with Trade Ranking allows complete signal ranking.

Creating a Trade Database file with Signal Ranking

In this section we go through each step needed to create a trade database with provisional trades and signal ranking. The following three important elements are needed to create a signal ranking back test, the first two of which were not available in previous editions of TradeSim.

- Include All Signals **NEW**
- Provisional Trades **NEW**
- Variable Trade Ranking

In the next sections we will outline each of these features in isolation and then combine them to create the desired test environment.

Including All Signals

Starting with Version 8.2.2 of the plug-in we have included an additional function called IncludeAllSignals. Previously when the plug-in would be used to generate a trade database it would scan for entry triggers and when it found one it would enter into a trade and ignore subsequent entry triggers until it found the next exit trigger. When IncludeAllSignals is called all entry triggers are now matched to the nearest exit trigger and the additional trades are added to the trade database. The following code stub example shows the use of the IncludeAllSignals function.

```
EntryTrigger := Ref(Cross(MACD(),Mov(MACD(),9,E)),-1);

EntryPrice := OPEN;

ExitTrigger := Ref(Cross(Mov(MACD(),9,E),MACD()),-1);

ExitPrice := OPEN;

InitialStop:=0;


ExtFml( "TradeSim.Initialize");

ExtFml( "TradeSim.IncludeAllSignals");

ExtFml( "TradeSim.ShowTrades",LONG,"AMP");


ExtFml( "TradeSim.RecordTrades",

        "IncludeAllSignals",      { Trade Database Filename }

         LONG,                    { Trade Position Type }

         EntryTrigger,          { Entry Trigger }

         EntryPrice,            { Entry Price }

         InitialStop,           { Optional Initial Stop }

         ExitTrigger,           { Exit Trigger }

         ExitPrice,             { Exit Price }

         START);                { Recorder Control }
```

Note that with this function the trade database will be a lot larger because of the additional trade signals. This feature is primarily used for signal ranking. If all signals are included in the trade database and "Disallow more than one open position with the same symbol" is enabled in the Trade Preferences then the additional signals in the trade database should have little effects on the results.

Running the trade database exploration code produced the following signal chart in TradeSim.

Shown below is an example of a Signal Chart without IncludeAllSignals. Additional entry triggers between trade entry and exit are ignored. The white broken line trade vectors show that there is only one trade starting on 14-May-2008 and 16-Jul-2008, even though there are several other entry triggers between these dates, which are ignored.
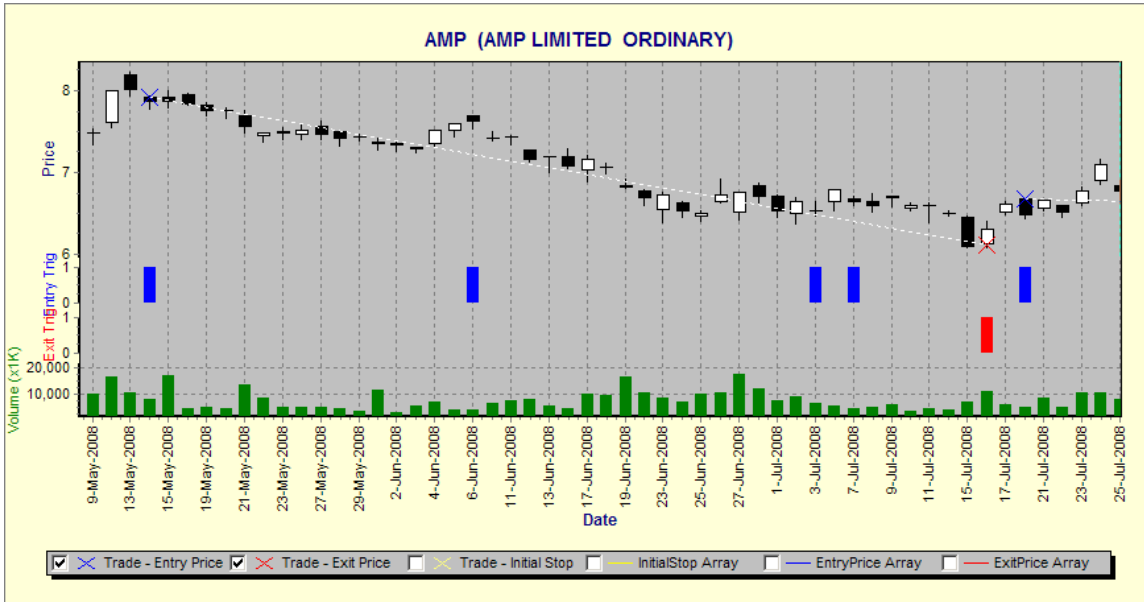
Shown below is an example of a Signal Chart with IncludeAllSignals (white broken line vectors). There is an additional three entry triggers between 14-May-2008 and 16-Jul-2008, which are included as additional trade data in the trade database.
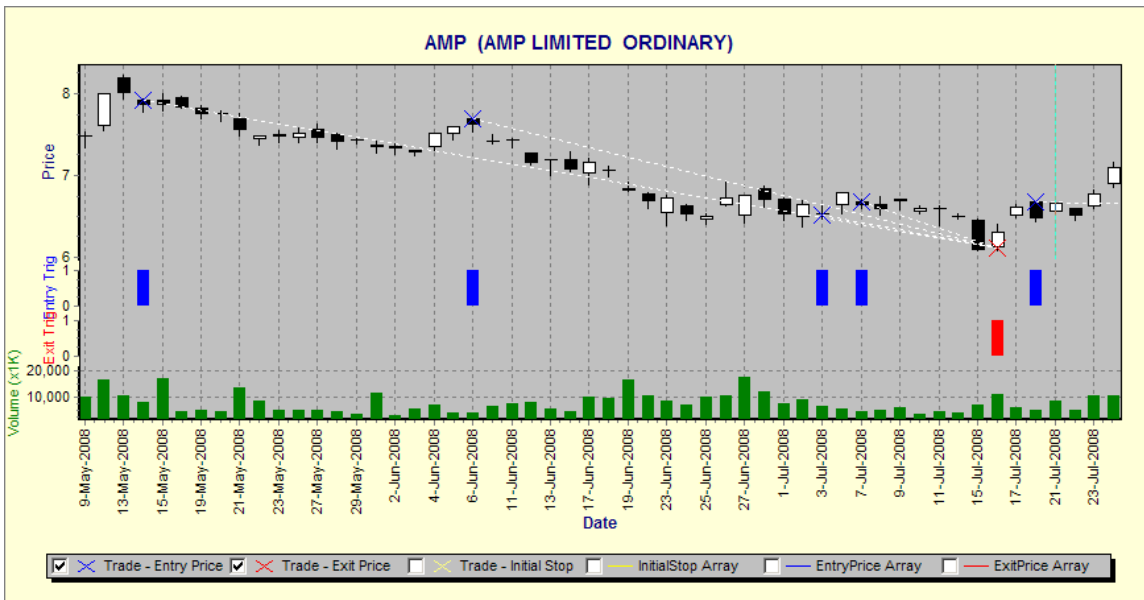
Creating Provisional Trades

To create provisional trades there is no additional function that you need to call to switch this feature on. If the EntryTrigger is non-zero and negative then the trade will be added to the trade database with the confirm entry flag CE=false. If the EntryTrigger is non-zero and positive then the trade will be added to the trade database with the confirm entry flag CE=true.

The following code stub illustrates how to implement provisional trades. The normal trade triggers are generated with the EntryTrigger1 expression. A confirm entry formula is created using another function called ConfirmEntry. When ConfirmEntry is '1' a positive entry trigger is used to confirm entry and the internal CE flag is set to true. When ConfirmEntry is '0' a negative entry trigger is used to set the internal CE flag to false.

```
EntryTrigger1 := Ref(Cross(MACD(),Mov(MACD(),9,E)),-1);

EntryPrice := OPEN;

ExitTrigger := Ref(Cross(Mov(MACD(),9,E),MACD()),-1);

ExitPrice := OPEN;

InitialStop:=0; { No Initial Stop used }


ConfirmEntry:= Open < ref(L,-1);

EntryTrigger:=If(ConfirmEntry,EntryTrigger1,-EntryTrigger1);


ExtFml( "TradeSim.Initialize");

ExtFml( "TradeSim.IncludeAllSignals");

ExtFml( "TradeSim.ShowTrades",LONG,"AMP");

ExtFml( "TradeSim.RecordTrades",

        "Test Provisional Trades",      { Trade Database Filename }

         LONG,                  { Trade Position Type }

         EntryTrigger,          { Entry Trigger }

         EntryPrice,            { Entry Price }

         InitialStop,           { Optional Initial Stop }

         ExitTrigger,           { Exit Trigger }

         ExitPrice,             { Exit Price }

         START);                { Recorder Control }
```

Running the trade database exploration code produced the following signal chart in TradeSim. The dark blue Entry Trigger bars indicate trades where Confirm Entry=true. The light blue Entry Trigger bars indicate trades where Confirm Entry=false.
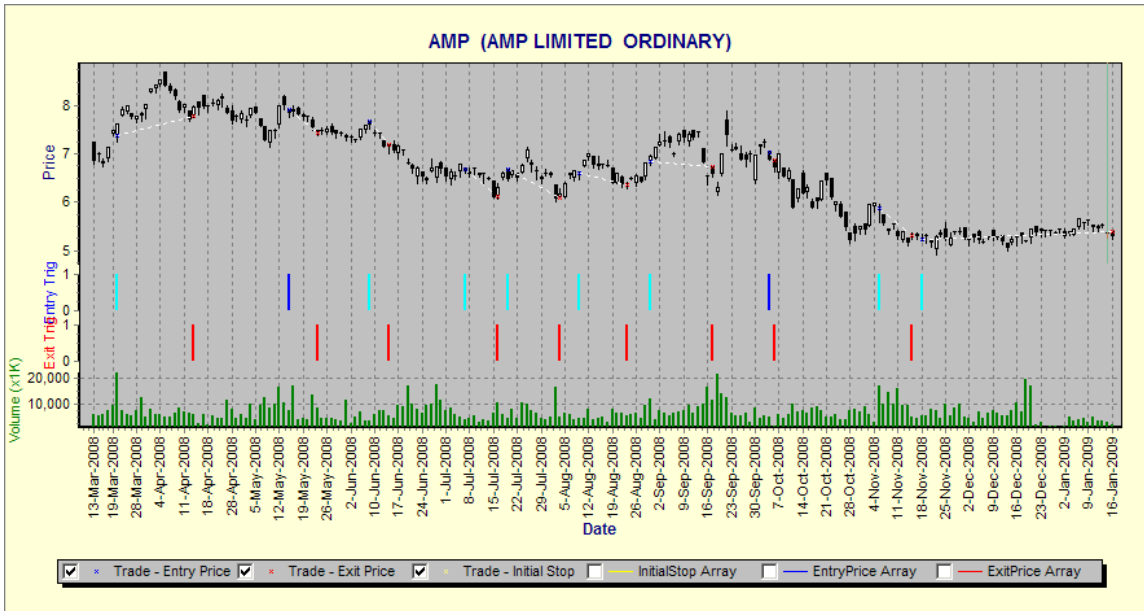
Clicking on the Trade Data tab of the diagnostic signal window shows all of the trades written to the trade database for the security of interest, which is AMP in this case. The CE column shows when the CE flag is set true which in this case will be when Open is less than yesterdays low.

Variable Trade Rank.

It is possible to rank trades in the trade database by assigning a ranking value to each trade or symbol. In the case of signal ranking we want to apply a ranking to each trade based on a formula. This is facilitated using the SetVariableTradeRank function in the Metastock/TradeSim plugin library.

```
ExtFml( "TradeSim.SetVariableTradeRank",ValueArray);
```

This function assigns Trade Ranking based on the *ValueArray* parameter. This allows additional scope in assigning trade rank values unlike the *AssignValue* function, which only allows a constant rank value to be assigned to a symbol so that every trade can only have the same rank. The *ValueArray* can be a numeric constant or can be any numeric or Metastock formula expression.

> **Note:** When using rank to prioritize trades with a given entry date it is important to enable the Trade Rank sorting option in the 'Trade Database Loading Options' in the global preferences. This will sort the trade list in the trade database manager so that

higher(or lower) ranked trades appear earlier in the list thus assigning higher precedence over other trades of a given entry date. It is also important to note that using Random Walk or running a Monte Carlo simulation invalidates the ranking priority of the trades since the trades will be randomly arranged when a simulation is run.

The following code stub applies a variable trade ranking based on a normalized ATR function.

```
EntryTrigger := Ref(Cross(MACD(),Mov(MACD(),9,E)),-1);

EntryPrice := OPEN;

ExitTrigger := Ref(Cross(Mov(MACD(),9,E),MACD()),-1);

ExitPrice := CLOSE;

InitialStop:=0;                    { No Initial Stop used }


ExtFml( "TradeSim.Initialize");
ExtFml( "TradeSim.SetVariableTradeRank",ATR(10)/mov(C,10,S));


ExtFml( "TradeSim.RecordTrades",

        "Test Trade Rank",      { Trade Database Filename }

         LONG,                  { Trade Position Type }

         EntryTrigger,          { Entry Trigger }

         EntryPrice,            { Entry Price }

         InitialStop,           { Optional Initial Stop }

         ExitTrigger,           { Exit Trigger }

         ExitPrice,             { Exit Price }

         START);                { Recorder Control }
```

After you have created a trade database, before you load it into TradeSim make sure that you have the Trade Database loading options to sort by rank otherwise the significance of the ranking will be ignored. These options can be found in the global preferences under the Tools Menu.
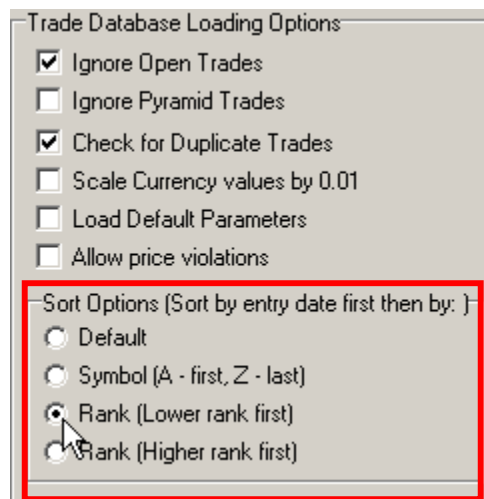
When loading is set to sort by rank (lower rank first) this means that trades with lower rank will have higher priority over trades with higher rank. When loading is set to sort by rank (higher rank first) this means that trades with higher rank will have higher priority over trades with lower rank.

The following screen grab shows the trade database loaded into TradeSim. This trade database was generated from all securities in the S&P ASX-20. The highlighted band shows trades with the same entry date but sorted on rank (lower rank first)

Putting it all together for a complete Signal Ranking trading system.

The following code stub illustrates the trade database code for a complete signal ranking trading system. The code marked in red is the additional code needed to achieve signal ranking.

```
EntryTrigger1 := Ref(Cross(MACD(),Mov(MACD(),9,E)),-1);

EntryPrice := OPEN;

ExitTrigger := Ref(Cross(Mov(MACD(),9,E),MACD()),-1);

ExitPrice := OPEN;

InitialStop:=0; { No Initial Stop used }


ConfirmEntry:= Open < ref(L,-1);

EntryTrigger:=If(ConfirmEntry,EntryTrigger1,-EntryTrigger1);


ExtFml( "TradeSim.Initialize");

ExtFml( "TradeSim.IncludeAllSignals");

ExtFml( "TradeSim.SetVariableTradeRank",ATR(10)/mov(C,10,S));

ExtFml( "TradeSim.RecordTrades",
```

```
        "Test Signal Ranking",     { Trade Database Filename }

        LONG,                      { Trade Position Type }

        EntryTrigger,              { Entry Trigger }

        EntryPrice,                { Entry Price }

        InitialStop,               { Optional Initial Stop }

        ExitTrigger,               { Exit Trigger }

        ExitPrice,                 { Exit Price }

        START);                    { Recorder Control }
```

After you have created a trade database, before you load it into TradeSim make sure that you have the Trade Database loading options to sort by rank otherwise the significance of the ranking will be ignored. These options can be found in the global preferences under the Tools Menu.
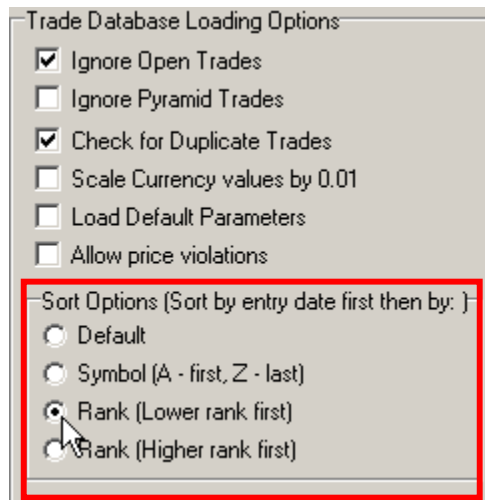
Check that correct ranking has been achieved by inspecting the ranking column.

Check that the CE flag is not enabled for all trades.

In the trade parameters window make sure you tick 'Enable Provisional Trades'. Optionally you can limit the number of trades you can enter on any one-day as well as limiting the maximum number of open positions which in this example has been limited to 2 and 10 respectively.

Run a simulation and check the Trade Log for Provisional trades. These will be entries in the trade log, which have yellow text on a gray/silver background and do not have a corresponding exit log in the table.

Shown below is the closed trade equity plot with linear time scale axis.
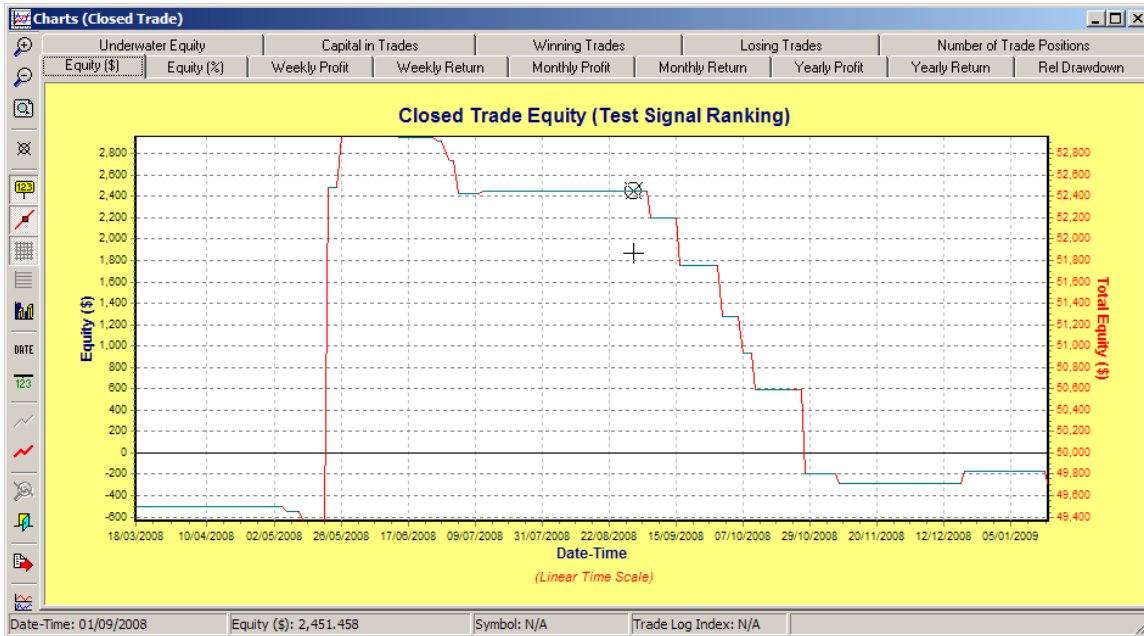
With the Enterprise Edition it is possible to plot the bar-bar-bar open equity chart overlaid on the closed trade equity chart.
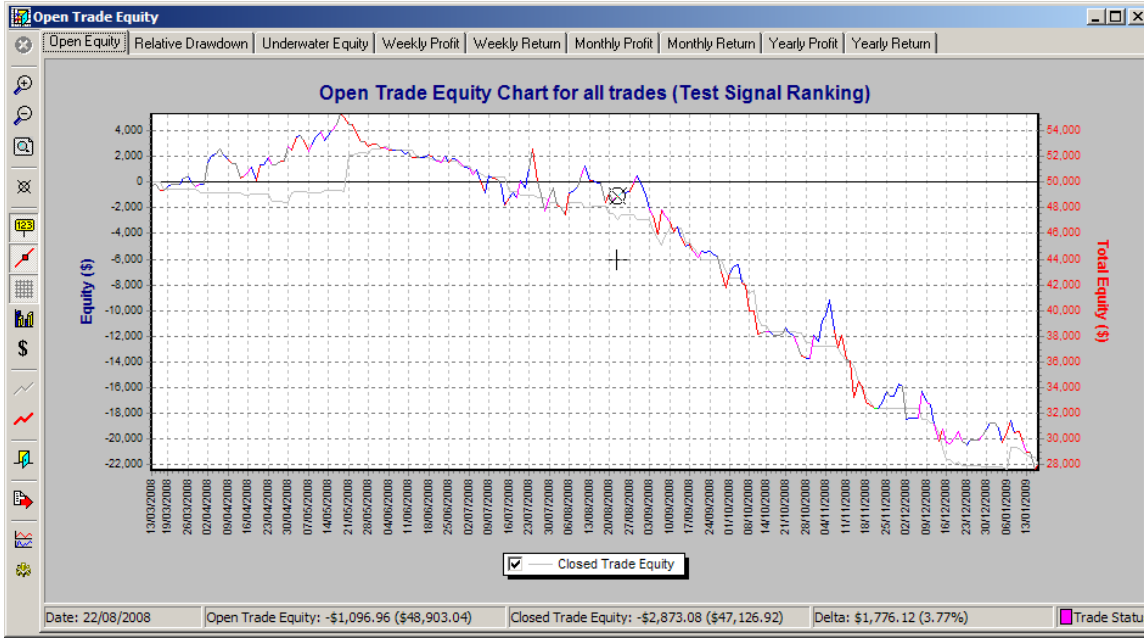
Without provisional trades enabled, when you re-run the simulation the CE flag is ignored and all trades are available to be taken. You will notice there are no longer any provisional trade entries in the Trade Log and all entries have a matching exit.

Is Signal Ranking Useful ??

After implementing Signal Ranking in TradeSim I have found that it has limited value when it comes to evaluating the robustness of a Trading system. For a start how do you derive your trade selection criteria and what tests do you use to ascertain whether or not your trade selection criteria always results in the optimum selection of trades ?? It would be a tall leap of faith to assume that a few formulas would somehow reveal that one stock was a better bet than another even if it was only based on intuition. Without thorough statistical analysis your assumption and hypothesis could be completely wrong and misleading.

The reason why I say this is because I have just recently tested one of these one-pass portfolio trading systems with signal ranking and just by overriding the ranking and randomly selecting trades from multiple entry triggers I was able to generate a better outcome than the fixed selection based on a certain ranking criteria. Food for thought anyway.

With TradeSim when you run enough simulations in a Monte Carlo analysis it will most likely cover the instance of the trade selection that was forced by the ranking criteria. However this trade selection will be one of many (from tens of thousands in fact) and most likely won't be the most optimum choice. It is possible that a completely random selection of trades could be much better trade selection criteria than your original ranking which maybe counter intuitive to what you think but that is why it needs to be tested and investigated properly, which many people don't actually do when they force their trade sequence using ranking.

Reference Literature

This list of references is by no means exhaustive but represents material, which is either recommended, or for general reading.

1) Compuvision Australia. TradeSim User Manual.

2) Equis. **Metastock for Windows 95/98 & NT**. This is the user manual that comes with Metastock Version 7.0 and is a prerequisite for using TradeSim.