Option Androker

A rule-based Option selection tool

Nondescript
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Introduction

One of the hardest challenges that options' traders face when entering a new position is choosing the right strategy to maximize their potential profits.

Options trading is a very flexible form of investment, and it's possible to profit from several different outlooks over above simply expecting a financial instrument to rise or fall in price. However, in order to do so a trader must choose an appropriate options trading strategy and this isn't always an obvious choice. Also, choosing one option to purchase amongst the large pool on market can be a risky and tedious process.

There isn't necessarily always a right decision in any given circumstance; there are strategies, though, that are particularly suitable for certain outlooks.

This system provides compiled selection tool to help you choose an options trading strategy, as well as the option you can purchase, by self-assessing outlook on an underlying asset. To use the tool, you simply need to pick the underlying asset (here: company's stock you want to trade on) *and it suggests you the option with the best profit result.*

Background Theory

Options are a type of derivative security which are contracts that grant the right, but not the obligation to buy or sell an underlying asset at a set price on or before a certain date. The right to buy is called a **call option** and the right to sell is a **put option**. The price at which an underlying stock can be purchased or sold is called the **strike price**. This is the price a stock market price must go above (for calls) or go below (for puts) for a profit. **Option price** refers to the amount per share that an option is traded i.e. the price to buy the option contract.

Options' Delta tells you how much money a stock option will rise or drop in value with a $1 rise or drop in the underlying stock, which also translates to the amount of profit you will make when the underlying stock rises. This means that the **higher the delta value a stock option has, the more it will rise with every $1 rise in the underlying stock**. For example, stock options with options delta of 0.7 is expected to rise $0.70 with a $1 rise in the underlying stock. Stock options value is affected most by changes in the price of the underlying stock, making delta value of stock options helpful for this tool to assess which option would generate more money for the trader. Options **delta** values are either **positive or negative**. Positive delta value becomes profitable as the stock goes up and negative delta value becomes profitable as the stock goes down. Delta was calculated manually for the prototype run using **Black-Scholes Model** (https://en.wikipedia.org/wiki/Black–Scholes_model).

The following outlooks are taken care of by the tool:

Moderate Rise: If system is expecting an underlying security to increase in price, but only expect a small increase, then the following strategy is applied:

- **Short Put (http://www.investopedia.com/terms/s/short-put.asp)**
- **Delta Range** (as considered in rules): 0 < delta < 0.5

Significant Rise: The following strategy is applied for when system expects the price of an underlying security to rise significantly:

- **Long Call (http://www.theoptionsguide.com/long-call.aspx)**
- **Delta Range** (as considered in rules): 0.5 < delta < 1

Moderate Fall: If the system is forecasting the price of an underlying security to fall, but only by a small amount, then the following options trading strategy is applied:

- **Short Call (http://www.investopedia.com/terms/s/short-call.asp)**
- **Delta Range** (as considered in rules): -0.5 < delta < 0

Significant Fall: The following strategy is applied for when the system expects the price of an underlying security to fall significantly:

- **Long Put (http://www.investopedia.com/terms/l/long_put.asp)**
- **Delta Range** (as considered in rules): -1 < delta < -0.5

Knowledge Base

[Rule 1] Defines the moderate fall outlook based on the delta value as described in background theory

[Rule 2] Defines the significant fall outlook based on delta value

[Rule 3] Defines the moderate rise outlook based on delta value

[Rule 4] Defines the significant rise outlook based on delta value

[Rule 5] Defines that to handle moderate fall outlook, short call strategy needs to be used

[Rule 6] Defines that to handle significant fall outlook, long put strategy needs to be used

[Rule 7] Defines that to handle moderate rise outlook, short put strategy needs to be used

[Rule 8] Defines that to handle significant rise outlook, long call strategy needs to be used

[Rule 9] Defines that if short call strategy is used, the trader is obligated to sell the underlying stock at expiration.

[Rule 10] Defines that if the trader is obligated to sell, he needs to own the underlying stocks.

[Rule 11] Defines that if trader does not have the asset available but needs to own it, then he is recommended to buy the stocks. This is due to the contract as the trader agrees to sell an asset on expiration that (s)he doesn't currently own.

[Rule 12] If the short put strategy is used, short put profit needs to be calculated; as the calculation varies with the strategies.

[Rule 13] If the long call strategy is used, long call profit needs to be calculated, which, uses long total call outflow (function)

[Rule 14] If the short call strategy is used, short call profit needs to be calculated.

[Rule 15] If the long put strategy is used, long put strategy needs to be calculated, which, uses net put inflow (function).

User Manual

Instructions:

Copy the file **optionAndroker.clp** to the **BIN** folder under the **JESS** directory.

Open JESS and execute the below commands:

(batch optionAndroker.clp)

In case the grader wants to change inputs and test new inputs, make changes to the following lines only:

- **Line 35**: `(defglobal ?*companyName* = "TCS") [It should match the company name from the uncommented facts]`
- **Line 36**: `(defglobal ?*assetAvail* = FALSE) [Boolean to get input whether the investor already owns the underlying stock or not; can be TRUE/FALSE only]`
- **Line 39-46**: `deffacts data [Can modify any of the values; uncomment only one or (maximum)two facts of the same company at a time; company name should match with global variable ?*companyName*]`

```
;Modify here for testing


(defglobal ?*companyName* = "TCS")
(defglobal ?*assetAvail* = FALSE)
;Facts Database for Options
(deffacts data
  (company (companyName "TCS")      (currentMarketPrice 30)   (strikePrice 32)   (optionPrice 10)    (delta -0.7))
  (company (companyName "TCS")      (currentMarketPrice 30)   (strikePrice 31)   (optionPrice 12)    (delta -0.5))
  ;(company (companyName "Alphabet") (currentMarketPrice 50)   (strikePrice 52)   (optionPrice 28.76)    (delta 0.3)
  ;(company (companyName "Alphabet") (currentMarketPrice 50)   (strikePrice 48)   (optionPrice 35)    (delta 0.4))
  ;(company (companyName "Apple")    (currentMarketPrice 40)   (strikePrice 45)   (optionPrice 13)    (delta -0.2))
  ;(company (companyName "Apple")    (currentMarketPrice 40)   (strikePrice 43)   (optionPrice 21)    (delta -0.4))
  ;(company (companyName "IBM")      (currentMarketPrice 55)   (strikePrice 40)   (optionPrice 1.5)    (delta 0.7))
  ;(company (companyName "IBM")      (currentMarketPrice 55)   (strikePrice 46)   (optionPrice 2.38)   (delta -0.4))
  )


(printout t "*********************Welcome to Option Androker*********************" crlf)
```

Results

Here is the sample output for one of the scenarios:

```
********************Welcome to Option Androker*********************
The option listing for TCS you should consider is:
currentMarketPrice     : 30.0
Strike Price           : 32.0
Option Price           : 10.0
Delta Price(closer to) : -0.699999988079071


      Comparing Performances of listings available for TCS by applying strategy of each on all



If you choose TCS :
currentMarketPrice: 30
Strike Price : 31
Option Price : 12
Delta Price : -0.5

If you choose TCS :
currentMarketPrice: 30
Strike Price : 32
Option Price : 10
Delta Price : -0.7

Rule 1 : -1 < Delta (-0.7) < -0.5 indicating Significant Fall = TRUE

Rule 6 : Significant Fall = TRUE is handled by Long Put strategy

Rule 6 : Significant Fall = TRUE is handled by Long Put strategy

(Net Put Inflow = 19)

Rule 15 : Long Put Profit = 19
(Net Put Inflow = 22)

Rule 15 : Long Put Profit = 22
f-0    (MAIN::initial-fact)
f-1    (MAIN::company (companyName "TCS") (currentMarketPrice 30) (strikePrice 32) (optionPrice 10) (delta -0.7))
f-2    (MAIN::company (companyName "TCS") (currentMarketPrice 30) (strikePrice 31) (optionPrice 12) (delta -0.5))
For a total of 3 facts in module MAIN.
```

From the captures, we can see that the system suggested the second option with delta -0.7 (which is closer to -0.69999..) and from the performance measure we can see that the profit generated for second option contract (22) is greater than the first one (19) using the Long Put strategy.