BollingerBands

Descrição Matemática

Uma série que representa os preços (geralmente no fechamento). x

Calculamos a média móvel (simples) em um determinado momento nos últimos valores: $n\mu = \frac{1}{n}\sum_{i=1}^{n} x_i$

Monitoramento de desvio padrão: $\sigma = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(x_i - \mu)^2}$

Os três componentes da ferramenta são:

- banda superior: $\mu + \delta\sigma$
- banda central (média móvel): μ
- banda inferior: $\mu - \delta\sigma$

O parâmetro é historicamente igual a 2, mas conforme descrito anteriormente, pode ser adaptado de acordo com a análise realizada. δ

Ref: https://pt.frwiki.wiki/wiki/Bandes_de_Bollinger (https://pt.frwiki.wiki/wiki/Bandes_de_Bollinger)

In [1]:

```
∑ᵢᵏ = sum
MA(V)= ∑ᵢᵏ(V)/length(V)
SMA(V, P) = [ K>=P && 0<P<=length(V) ? MA(V[K-P+1:K]) : missing for K ∈ 1:length
(V)]
```

Out[1]:

```
SMA (generic function with 1 method)
```

In [2]:

```
BB(V,P,δ=2) = begin
     ∑ = sum
     n = length(V)
     σ(v) =  √((1/length(v)) * ∑((v .- MA(v)).^2))
     μₙ= SMA(V, P)
     σₙ= [ K>=P && 0<P<=n ? σ(V[K-P+1:K]) : missing for K ∈ 1:n]
     bh = μₙ .+ δ.*σₙ
     bl = μₙ .- δ.*σₙ
     (μₙ,bh,bl)
end
```

Out[2]:

```
BB (generic function with 2 methods)
```

In [11]:

```
BB([1,2,3,4,5],3)
```

Out[11]:

```
(Union{Missing, Float64}[missing, missing, 2.0, 3.0, 4.0], Union{Mis
sing, Float64}[missing, missing, 3.632993161855452, 4.63299316185545
25, 5.6329931618554525], Union{Missing, Float64}[missing, missing,
0.36700683814454793, 1.367006838144548, 2.367006838144548])
```

In [4]:

```
using Plots
```

In [5]:

```
plotly()
```

```
┌ Info: For saving to png with the Plotly backend PlotlyBase has to
be installed.
└ @ Plots /home/konira/.julia/packages/Plots/lW9ll/src/backends.jl:3
18
```

Out[5]:

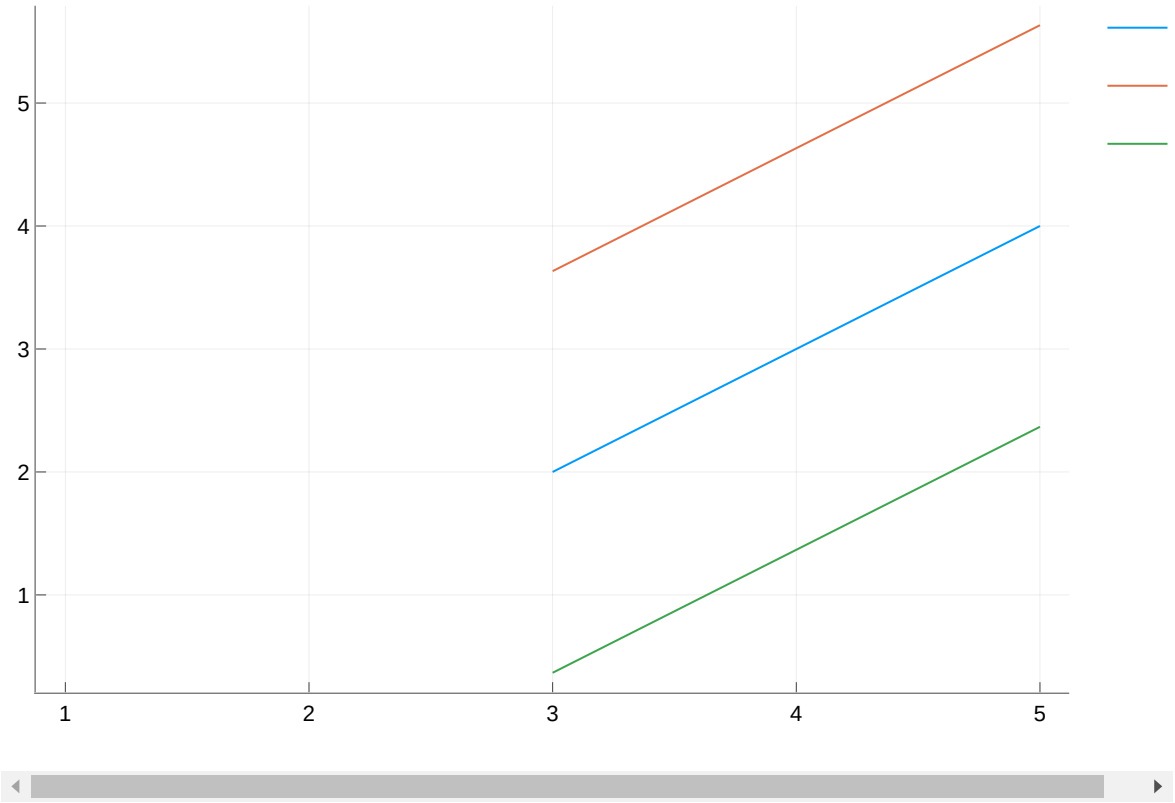
```
Plots.PlotlyBackend()
```

In [6]:

```
(μₙ,bh,bl) = BB([1,2,3,4,5],3)

plot(μₙ)
plot!(bh)
plot!(bl)
```

Out[6]:



In [7]:

```
using PyCall
@pyimport vectorbt as vbt
dados = vbt.BinanceData.download("MATICUSDT", start="2021-06-01",interval="1d").
get()
first(dados)
```

```
/home/konira/.local/lib/python3.10/site-packages/dateparser/date_par
ser.py:35: PytzUsageWarning: The localize method is no longer necess
ary, as this time zone supports the fold attribute (PEP 495). For mo
re details on migrating to a PEP 495-compliant implementation, see h
ttps://pytz-deprecation-shim.readthedocs.io/en/latest/migration.html
  date_obj = stz.localize(date_obj)
2021-06-01 03:00:00+00:00 - 2022-09-03 00:00:00+00:00: : 1it [00:01,
1.05s/it]
```

Out[7]:

```
"Open"
```

In [8]:

```
using DataFrames,TimeSeries,Dates
```

In [9]:

```
matic = DataFrame(timestamp=dados.index .|> c->c ,Close=dados.Close .|> c->c ,Op
en=dados.Open .|> c->c ,High=dados.High .|> c->c,Low=dados.Low .|> c->c)
first(matic)
```

Out[9]:

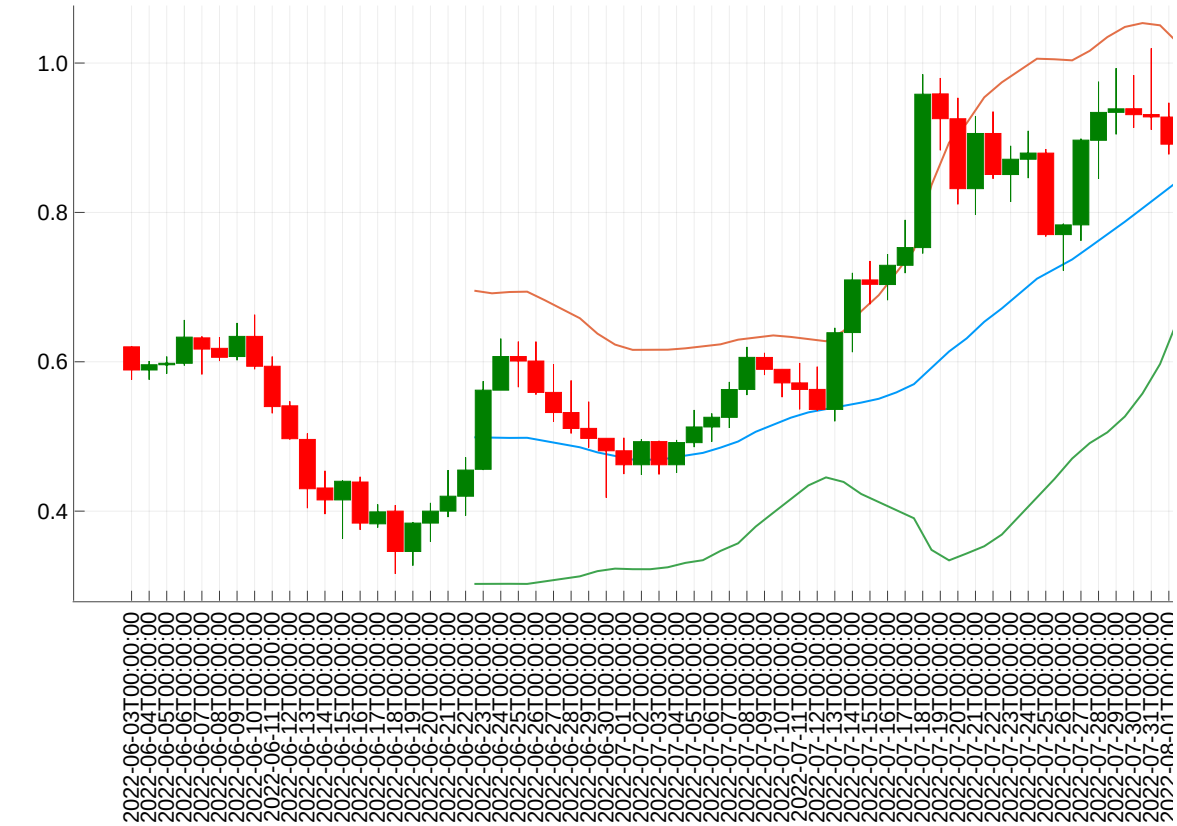
DataFrameRow (5 columns)

	timestamp	Close	Open	High	Low
	DateTime	Float64	Float64	Float64	Float64
1	2021-06-02T00:00:00	1.7996	1.82492	1.89	1.7496

In [10]:

```
with(:plotly, size=(900,500)) do
  amostragem = filter(row -> row.timestamp > DateTime("2022-06-02T00:00:00"),mat
ic)
  (μₙ,bh,bl) = BB(amostragem.Close,20,2)
  plot(μₙ)
  plot!(bh)
  plot!(bl)
  plot!(TimeArray(amostragem, timestamp = :timestamp), seriestype = :candlestick
)
end
```

Out[10]:



In [ ]:

```

```