**spread\_note** 

The Brazilian stock exchange (B3) has the following trading hours in the spot market:

	Início	Fim
Cancelamento de Ofertas	09:30	09:45
Pré-Abertura	09:45	10:00
Negociação	10:00	17:55
Call de Fechamento	17:55	18:00
Cancelamento de Ofertas(After Market)	18:25	18:45

We have to types of financial data: (i) intraday quotes and (ii) intraday best bid and best ask.

When you look at, for example, for PRIO3 we get the following data:

Open Auction final price and volume

ticker	trade_time	price	quantity
PRIO3	2022-12-23 10:08:20.283	35.95	57400

## Normal trading hours

ticker	trade_time	price	quantity
PRIO3	2022-12-23 10:08:20.287	35.92	1000
PRIO3	2022-12-23 10:08:20.297	35.90	200
PRIO3	2022-12-23 10:08:20.360	35.75	6000
PRIO3	2022-12-23 10:08:20.457	35.85	100
PRIO3	2022-12-23 10:08:20.837	35.85	300
PRIO3	2022-12-23 10:08:21.287	35.85	600
PRIO3	2022-12-23 10:08:23.033	35.89	800

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ticker	trade_time	price	quantity
PRIO3	2022-12-23 10:08:24.397	35.95	9000
PRIO3	2022-12-23 10:08:24.580	35.96	3000
PRIO3	2022-12-23 10:08:25.307	35.86	6200

## Auction bids and asks

spread_time	bid	ask
2022-12-23 09:45:03.224	0.00	0.00
2022-12-23 09:45:03.225	0.00	35.26
2022-12-23 09:45:03.227	35.11	35.26
2022-12-23 09:45:03.232	35.05	35.26
2022-12-23 09:45:03.238	35.11	35.26
2022-12-23 09:58:07.715	35.42	29.98
2022-12-23 09:58:44.633	0.00	29.98
2022-12-23 09:59:05.226	0.00	29.98
2022-12-23 09:59:43.391	35.26	29.98
2022-12-23 09:59:58.159	0.00	29.98

## Trading hours (Negative Spreads)

spread_time	bid	ask
2022-12-23 10:00:02.488	0.00	29.98
2022-12-23 10:00:49.616	35.55	29.98
2022-12-23 10:00:57.987	0.00	29.98
2022-12-23 10:01:00.585	0.00	29.98

spread_time	bid	ask
2022-12-23 10:01:05.007	40.88	29.98
2022-12-23 10:08:07.657	36.00	29.98
2022-12-23 10:08:20.324	36.00	29.98
2022-12-23 10:08:20.326	36.00	33.00
2022-12-23 10:08:20.334	35.83	35.95
2022-12-23 10:08:20.349	35.78	35.90

As you can see, the spread in **2022-12-23 10:08:20.326** is negative, just like the previous ones, turning positive soon after. At this moment we already have normal trades, as can be seen at **2022-12-23 10:08:20.297**.

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