Data Dictionary (Limit Order Book Features)

1 Time Information

- `system_time`: Exact system time of data recording
- `timestamp`: Rounded timestamp used for analysis (`pd.to_datetime(df['system_time']).dt.round('min')`)

2 Price Information

- `midpoint`: Midpoint price between best bid and best ask
- `spread`: Difference between best bid and best ask

3 Trade Activity

- `buys`: Number of executed buy trades in this interval
- `sells`: Number of executed sell trades in this interval

4 Bid Book Distances (from midpoint)

- `bids_distance_0`: Distance of bid level 0 from the midpoint in %
- `bids_distance_1`: Distance of bid level 1 from the midpoint in %
- `bids_distance_2`: Distance of bid level 2 from the midpoint in %
- `bids_distance_3`: Distance of bid level 3 from the midpoint in %
- `bids_distance_4`: Distance of bid level 4 from the midpoint in %
- `bids_distance_5`: Distance of bid level 5 from the midpoint in %
- `bids_distance_6`: Distance of bid level 6 from the midpoint in %
- `bids_distance_7`: Distance of bid level 7 from the midpoint in %
- `bids_distance_8`: Distance of bid level 8 from the midpoint in %
- `bids_distance_9`: Distance of bid level 9 from the midpoint in %
- `bids_distance_10`: Distance of bid level 10 from the midpoint in %
- `bids_distance_11`: Distance of bid level 11 from the midpoint in %
- `bids_distance_12`: Distance of bid level 12 from the midpoint in %
- `bids_distance_13`: Distance of bid level 13 from the midpoint in %
- `bids_distance_14`: Distance of bid level 14 from the midpoint in %

5 Bid Notional Volumes

- `bids_notional_0`: Total notional amount at bid level 0
- `bids_notional_1`: Total notional amount at bid level 1
- `bids_notional_2`: Total notional amount at bid level 2
- `bids_notional_3`: Total notional amount at bid level 3
- `bids_notional_4`: Total notional amount at bid level 4
- `bids_notional_5`: Total notional amount at bid level 5
- `bids_notional_6`: Total notional amount at bid level 6
- `bids_notional_7`: Total notional amount at bid level 7
- `bids_notional_8`: Total notional amount at bid level 8
- `bids_notional_9`: Total notional amount at bid level 9
- `bids_notional_10`: Total notional amount at bid level 10
- `bids_notional_11`: Total notional amount at bid level 11
- `bids_notional_12`: Total notional amount at bid level 12
- `bids_notional_13`: Total notional amount at bid level 13

- `bids_notional_14`: Total notional amount at bid level 14
- `bids_cancel_notional_0`: Notional of cancelled orders at bid level 0
- `bids_cancel_notional_1`: Notional of cancelled orders at bid level 1
- `bids_cancel_notional_2`: Notional of cancelled orders at bid level 2
- `bids_cancel_notional_3`: Notional of cancelled orders at bid level 3
- `bids_cancel_notional_4`: Notional of cancelled orders at bid level 4
- `bids_cancel_notional_5`: Notional of cancelled orders at bid level 5
- `bids_cancel_notional_6`: Notional of cancelled orders at bid level 6
- `bids_cancel_notional_7`: Notional of cancelled orders at bid level 7
- `bids_cancel_notional_8`: Notional of cancelled orders at bid level 8
- `bids_cancel_notional_9`: Notional of cancelled orders at bid level 9
- `bids_cancel_notional_10`: Notional of cancelled orders at bid level 10
- `bids_cancel_notional_11`: Notional of cancelled orders at bid level 11
- `bids_cancel_notional_12`: Notional of cancelled orders at bid level 12
- `bids_cancel_notional_13`: Notional of cancelled orders at bid level 13
- `bids_cancel_notional_14`: Notional of cancelled orders at bid level 14
- `bids_limit_notional_0`: Notional of limit orders at bid level 0
- `bids_limit_notional_1`: Notional of limit orders at bid level 1
- `bids_limit_notional_2`: Notional of limit orders at bid level 2
- `bids_limit_notional_3`: Notional of limit orders at bid level 3
- `bids_limit_notional_4`: Notional of limit orders at bid level 4
- `bids_limit_notional_5`: Notional of limit orders at bid level 5
- `bids_limit_notional_6`: Notional of limit orders at bid level 6
- `bids_limit_notional_7`: Notional of limit orders at bid level 7
- `bids_limit_notional_8`: Notional of limit orders at bid level 8
- `bids_limit_notional_9`: Notional of limit orders at bid level 9
- `bids_limit_notional_10`: Notional of limit orders at bid level 10
- `bids_limit_notional_11`: Notional of limit orders at bid level 11
- `bids_limit_notional_12`: Notional of limit orders at bid level 12
- `bids_limit_notional_13`: Notional of limit orders at bid level 13
- `bids_limit_notional_14`: Notional of limit orders at bid level 14
- `bids_market_notional_0`: Notional of market orders at bid level 0
- `bids_market_notional_1`: Notional of market orders at bid level 1
- `bids_market_notional_2`: Notional of market orders at bid level 2
- `bids_market_notional_3`: Notional of market orders at bid level 3
- `bids_market_notional_4`: Notional of market orders at bid level 4
- `bids_market_notional_5`: Notional of market orders at bid level 5
- `bids_market_notional_6`: Notional of market orders at bid level 6
- `bids_market_notional_7`: Notional of market orders at bid level 7
- `bids_market_notional_8`: Notional of market orders at bid level 8
- `bids_market_notional_9`: Notional of market orders at bid level 9
- `bids_market_notional_10`: Notional of market orders at bid level 10
- `bids_market_notional_11`: Notional of market orders at bid level 11
- `bids_market_notional_12`: Notional of market orders at bid level 12
- `bids_market_notional_13`: Notional of market orders at bid level 13
- `bids_market_notional_14`: Notional of market orders at bid level 14

6 Ask Book Distances (from midpoint)

- `asks_distance_0`: Distance of ask level 0 from the midpoint in %
- `asks_distance_1`: Distance of ask level 1 from the midpoint in %
- `asks_distance_2`: Distance of ask level 2 from the midpoint in %
- `asks_distance_3`: Distance of ask level 3 from the midpoint in %

- `asks_distance_4`: Distance of ask level 4 from the midpoint in %
- `asks_distance_5`: Distance of ask level 5 from the midpoint in %
- `asks_distance_6`: Distance of ask level 6 from the midpoint in %
- `asks_distance_7`: Distance of ask level 7 from the midpoint in %
- `asks_distance_8`: Distance of ask level 8 from the midpoint in %
- `asks_distance_9`: Distance of ask level 9 from the midpoint in %
- `asks_distance_10`: Distance of ask level 10 from the midpoint in %
- `asks_distance_11`: Distance of ask level 11 from the midpoint in %
- `asks_distance_12`: Distance of ask level 12 from the midpoint in %
- `asks_distance_13`: Distance of ask level 13 from the midpoint in %
- `asks_distance_14`: Distance of ask level 14 from the midpoint in %

7 Ask Notional Volumes

- `asks_notional_0`: Total notional amount at ask level 0
- `asks_notional_1`: Total notional amount at ask level 1
- `asks_notional_2`: Total notional amount at ask level 2
- `asks_notional_3`: Total notional amount at ask level 3
- `asks_notional_4`: Total notional amount at ask level 4
- `asks_notional_5`: Total notional amount at ask level 5
- `asks_notional_6`: Total notional amount at ask level 6
- `asks_notional_7`: Total notional amount at ask level 7
- `asks_notional_8`: Total notional amount at ask level 8
- `asks_notional_9`: Total notional amount at ask level 9
- `asks_notional_10`: Total notional amount at ask level 10
- `asks_notional_11`: Total notional amount at ask level 11
- `asks_notional_12`: Total notional amount at ask level 12
- `asks_notional_13`: Total notional amount at ask level 13
- `asks_notional_14`: Total notional amount at ask level 14
- `asks_cancel_notional_0`: Notional of cancelled orders at ask level 0
- `asks_cancel_notional_1`: Notional of cancelled orders at ask level 1
- `asks_cancel_notional_2`: Notional of cancelled orders at ask level 2
- `asks_cancel_notional_3`: Notional of cancelled orders at ask level 3
- `asks_cancel_notional_4`: Notional of cancelled orders at ask level 4
- `asks_cancel_notional_5`: Notional of cancelled orders at ask level 5
- `asks_cancel_notional_6`: Notional of cancelled orders at ask level 6
- `asks_cancel_notional_7`: Notional of cancelled orders at ask level 7
- `asks_cancel_notional_8`: Notional of cancelled orders at ask level 8
- `asks_cancel_notional_9`: Notional of cancelled orders at ask level 9
- `asks_cancel_notional_10`: Notional of cancelled orders at ask level 10
- `asks_cancel_notional_11`: Notional of cancelled orders at ask level 11
- `asks_cancel_notional_12`: Notional of cancelled orders at ask level 12
- `asks_cancel_notional_13`: Notional of cancelled orders at ask level 13
- `asks_cancel_notional_14`: Notional of cancelled orders at ask level 14
- `asks_limit_notional_0`: Notional of limit orders at ask level 0
- `asks_limit_notional_1`: Notional of limit orders at ask level 1
- `asks_limit_notional_2`: Notional of limit orders at ask level 2
- `asks_limit_notional_3`: Notional of limit orders at ask level 3
- `asks_limit_notional_4`: Notional of limit orders at ask level 4
- `asks_limit_notional_5`: Notional of limit orders at ask level 5
- `asks_limit_notional_6`: Notional of limit orders at ask level 6
- `asks_limit_notional_7`: Notional of limit orders at ask level 7
- `asks_limit_notional_8`: Notional of limit orders at ask level 8

- `asks_limit_notional_9`: Notional of limit orders at ask level 9
- `asks_limit_notional_10`: Notional of limit orders at ask level 10
- `asks_limit_notional_11`: Notional of limit orders at ask level 11
- `asks_limit_notional_12`: Notional of limit orders at ask level 12
- `asks_limit_notional_13`: Notional of limit orders at ask level 13
- `asks_limit_notional_14`: Notional of limit orders at ask level 14
- `asks_market_notional_0`: Notional of market orders at ask level 0
- `asks_market_notional_1`: Notional of market orders at ask level 1
- `asks_market_notional_2`: Notional of market orders at ask level 2
- `asks_market_notional_3`: Notional of market orders at ask level 3
- `asks_market_notional_4`: Notional of market orders at ask level 4
- `asks_market_notional_5`: Notional of market orders at ask level 5
- `asks_market_notional_6`: Notional of market orders at ask level 6
- `asks_market_notional_7`: Notional of market orders at ask level 7
- `asks_market_notional_8`: Notional of market orders at ask level 8
- `asks_market_notional_9`: Notional of market orders at ask level 9
- `asks_market_notional_10`: Notional of market orders at ask level 10
- `asks_market_notional_11`: Notional of market orders at ask level 11
- `asks_market_notional_12`: Notional of market orders at ask level 12
- `asks_market_notional_13`: Notional of market orders at ask level 13
- `asks_market_notional_14`: Notional of market orders at ask level 14