



Technical Assessment

Hi There!

Thank you very much for having the previous session with us. and as agreed, we'd like to continue the recruitment journey with you for the role of Senior/Data Engineer. To better understand your technical skills, we'd like to see your response to the questions below. **Please read the description below to do the test:**

1. Please answer the questions below and submit your answer to your GitHub and share the repository with us (all the people who are cc'ed in the email) along with the following components as your attachment:
 - a. Spark or Flink code for the pipeline
 - b. CSV or JSON file exported from your resulting order book Kafka topic
 - c. Additional documentation to explain your result (optional)
2. The duration is five days after the day you have received the technical assessment
3. Should you have finished the assessment, kindly share the submission by replying to this email using **'Reply All'** option along with the GitHub link.
4. For all of the questions below, feel free to use any tools of your choice as long as the goal of the test is delivered

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The tests:

Build a data streaming pipeline using either Flink or Spark Structured streaming to process real-time crypto order data and generate an order book every 1 second. We have provided a Docker image for the Kafka broker and topic, as well as a Python script to emulate real-time events containing new crypto orders and/or changes to existing crypto orders (10 events every 100 ms) to a Kafka topic.

You can find examples of the input event below.

New order event

```
Python
{
  "order_id":1,
  "symbol":"BTC-USDT",
  "order_side":"BUY",
  "size":1,
  "price":393078814.9,
  "status":"OPEN",
  "created_at":1693973208
}
```

Close order event

```
Python
{
  "order_id":1,
  "status":"CLOSED",
  "created_at":1693973208
}
```

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The orders would be persisted until closed. Each second, the streaming pipeline would generate a Kafka message containing information to build an order book from the events that have been received. Below is the sample output for 1 second of the order book

```
Python
[
  {
    "symbol": "BTC-USDT",
    "side": "buy_1",
    "price": 34045.24,
    "amount": 6.51370,
    "total": 221760.4797880,
    "cum_sum": 221760.4797880
  },
  {
    "symbol": "BTC-USDT",
    "side": "sell_1",
    "price": 34054.25,
    "amount": 7.52013,
    "total": 256024.7058825,
    "cum_sum": 256024.7058825
  },
  {
    "symbol": "BTC-USDT",
    "side": "buy_2",
    "price": 34045.23,
    "amount": 0.00058,
    "total": 19.7462334,
    "cum_sum": 221780.2260214
  },
  {
    "symbol": "BTC-USDT",
    "side": "sell_2",
    "price": 34054.37,
    "amount": 0.10531,
    "total": 3585.3179147,
    "cum_sum": 259610.0237972
  }
]
```



The sample output corresponds to the first two levels of the following order book view

Buy Order					Sell Order				
Side	Price (USDT)	Amount (BTC)	Total (USDT)	Sum (USDT)	Side	Price (USDT)	Amount (BTC)	Total (USDT)	Sum (USDT)
Buy 1	34,045.24	6.51370	221,760.4797880	221,760.4797880	Sell 1	34,045.25	7.52013	256,024.7058825	256,024.7058825
Buy 2	34,045.23	0.00058	19,7462334	221,780.2260214	Sell 2	34,045.37	0.10531	3,585.3179147	259,610.0237972
Buy 3	34,044.94	0.02050	697,9212700	222,478.1472914	Sell 3	34,045.46	0.00065	22,1295490	259,632.1533462
Buy 4	34,044.87	0.00122	41,5347414	222,519.6820328	Sell 4	34,045.51	0.00672	228,7858272	259,860.9391734
Buy 5	34,044.82	0.00022	7,4898604	222,527.1718932	Sell 5	34,045.54	0.00022	7,4900188	259,868.4291922
Buy 6	34,044.64	0.00065	22,1290160	222,549.3009092	Sell 6	34,045.59	0.04492	1,529,3279028	261,397.7570950
Buy 7	34,044.51	0.00122	41,5343022	222,590.8352114	Sell 7	34,045.67	0.00065	22,1296855	261,419.8867805
Buy 8	34,044.46	0.00022	7,4897812	222,598.3249926	Sell 8	34,045.87	0.00065	22,1298155	261,442.0165960
Buy 9	34,044.23	0.00065	22,1287495	222,620.4537421	Sell 9	34,045.90	0.00022	7,4900980	261,449.5066940
Buy 10	34,044.15	0.00122	41,5338630	222,661.9876051	Sell 10	34,045.95	0.00122	41,5360590	261,491.0427530
Buy 11	34,044.10	0.00022	7,4897020	222,669.4773071	Sell 11	34,046.26	0.00022	7,4901772	261,498.5329302
Buy 12	34,043.82	0.00065	22,1284830	222,691.6057901	Sell 12	34,046.28	0.00065	22,1300820	261,520.6630122
Buy 13	34,043.79	0.00122	41,5334238	222,733.1392139	Sell 13	34,046.31	0.00122	41,5364982	261,562.1995104
Buy 14	34,043.74	0.00022	7,4896228	222,740.6288367	Sell 14	34,046.62	0.00022	7,4902564	261,569.6897668
Buy 15	34,043.54	0.00664	226,0491056	222,966.6779423	Sell 15	34,046.67	0.00122	41,5369374	261,611.2267042

The order book needs to be generated every second in one message to a separate Kafka topic.

Should you have any questions regarding the test, feel free to reach out to arief@pintu.co.id or send a WhatsApp text to +62 812 1839 3185.

Thank you very much, and good luck!

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