

The problem

Our business wants to move in the bitcoin market and we've been asked to implement the first cut of a simple RFQ (request-for-quote) service. The API looks like this and cannot be changed.

```
public interface RfqService {
    Optional<Quote> quoteFor(String currency, int amount);
}

public class Quote {
    public final double bid;
    public final double ask;

    public Quote(double bid, double ask) {
        this.bid = bid;
        this.ask = ask;
    }
}
```

The job of our engine is to respond with a bid (the price we buy at) and ask (the price we sell at) by finding an exact client offer to match on each side. To do so, our service has access to the company's live order board which given a single payment currency (e.g. USD) will return a list of clients' pending orders.

```
public interface LiveOrderBoard {
    List<Order> ordersFor(String currency);
}
```

Example response for USD:

Direction	Price	Payment Currency	Amount of Bitcoins
Buy	232.71	USD	200
Sell	232.74	USD	100
Sell	232.73	USD	200
Buy	232.71	USD	500
Buy	232.70	USD	100
Sell	232.75	USD	200
Buy	232.69	USD	500
Sell	232.76	USD	300
Buy	232.70	USD	200

The response from our service should be a single bid/ask quote. If the request cannot be fulfilled on both sides by our internal RFQ service, the response should be empty.

- Bid = highest buy order – X
- Ask = lowest sell order + X

The difference between the client order and our quote (i.e. the X amount) is how we make money. X is 0.02 irrespective of the currency.

Worked examples

RFQ for 200 bitcoins paying in USD should return:

- Bid (we buy) = 232.69
- Ask (we sell) = 232.75

RFQ for 500 bitcoins cannot be fulfilled because there's no matching Sell order.

The solution

Please provide an implementation of the RFQ engine in Java which will allow the business to enter the bitcoin market. No UI or persistence is required but your solution should be able to demonstrate the RFQ business rules given some sample inputs of your choice. We don't require an implementation of the live orders board. If you find the requirements unclear, you're free to make any assumptions along the way but please state them explicitly in a readme file within your solution. It should contain everything you would normally check in to your source code management system, and the code should be of production quality. Please zip and email the entire solution to your agent who will pass it on to us. Good luck!