Mandatory Exercise: External memory II

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1 Databases You are working as a consultant for the company "*Candles for All*", that sells candles. They want a database containing information about all their candles. Each candle has an unique id, a height, a color, and a price. They want to be able to update the database with insertions and deletions of candles. The database should support the following updates and queries efficiently:

- insert(i, c, h, p): insert a candle with id i, color c, height h and price p.
- delete(i): delete the candle with id i.
- report-height-price(a, b): Return the price of all candles with a height between a and b.
- report-price-color(a, b) : Return the color of all candles with a price between a and b.
- report-price-height(a, b): Return the height of all candles with a price between a and b.

Give a data structure supporting the required updates and queries. Analyse the space and the I/O complexity of your data structure.