

# Problem set 11: Auction theory and behavioral economics

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**Module 11.** Total: 100 points. Format: no-code sandbox.

## Before you start

This problem set tests three classic ideas, anchoring, the winner's curse, and the reserve price, against real transaction data rather than treating them as textbook abstractions. You will compute pricing power (the median of `usd_price_decimal` divided by `sale_estimates_high_usd_price` for sold records) and sell-through (the share of offered lots that sold, with both sold and unsold in the denominator) for a single brand or category, then argue from those figures to a theoretical conclusion. Choose one brand or category represented in any production table (for example a watch brand in `all_watches_data` or an artist in `all_fine_art_data`) and confirm its exact spelling in the coverage browser before writing any filter, since exact-match filters are spelling-sensitive.

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### Problem 1 (15 points): Anchoring and pricing power

In four to five sentences, define anchoring in the context of a pre-sale estimate, and explain why measuring pricing power (realized price relative to the high estimate) is a reasonable, though imperfect, way to test for an anchoring effect. Note one alternative explanation, besides anchoring, for why pricing power might sit above or below 1.0.

### Problem 2 (20 points): Compute pricing power for your chosen brand or category

Write a SQL query against one category table that computes pricing power for your chosen brand or category, restricted to sold records with a valid, non-zero high estimate.

```
-- your query here
```

In two to three sentences, state whether your result sits above, at, or below 1.0, and what that implies about how bidders responded to the pre-sale estimate.

### Problem 3 (20 points): Compute sell-through and connect it to the reserve price

Write a SQL query against the same table that computes sell-through for your chosen brand or category, with both sold and unsold lots in the denominator.

```
-- your query here
```

In three to four sentences, explain why an unsold lot is a rational outcome of a reserve price rather than a failure of the auction, and note one reason your sell-through figure could be low even in a category with strong buyer demand.

### Problem 4 (20 points): The winner's curse, a single lot versus a systematic pattern

In four to five sentences, explain the winner's curse in a competitive-bidding setting, and describe what pattern in pricing power across many lots, rather than a single high-profile sale, would be more consistent with a systematic winner's curse or anchoring effect than with noise. Note explicitly why a single documented auction result, however large, is not sufficient evidence on its own.

**Problem 5 (25 points): Pricing power across many brands and a theoretical argument**

Write a SQL query against your chosen table that computes pricing power for every brand or artist with at least 100 sold lots and a valid high estimate, ordered from highest to lowest.

-- your query here

Then write a short argument, 200 to 300 words, stating which of the three theoretical ideas in this module (anchoring, the winner's curse, or the reserve price and sell-through) your chosen brand's figures most clearly support, and which idea they leave ambiguous. Your argument must address at least one alternative explanation for the pattern you observe, and must include an explicit caution that the newest quarters of data are still being ingested, so any time-bucketed comparison should rely on the stable, longer-run pattern rather than the most recent few months.

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**Submission.** Turn in this file with your SQL and written answers filled in.