

Programming I
Academic Year 2025 (1st Trimester)

FINAL PROJECT

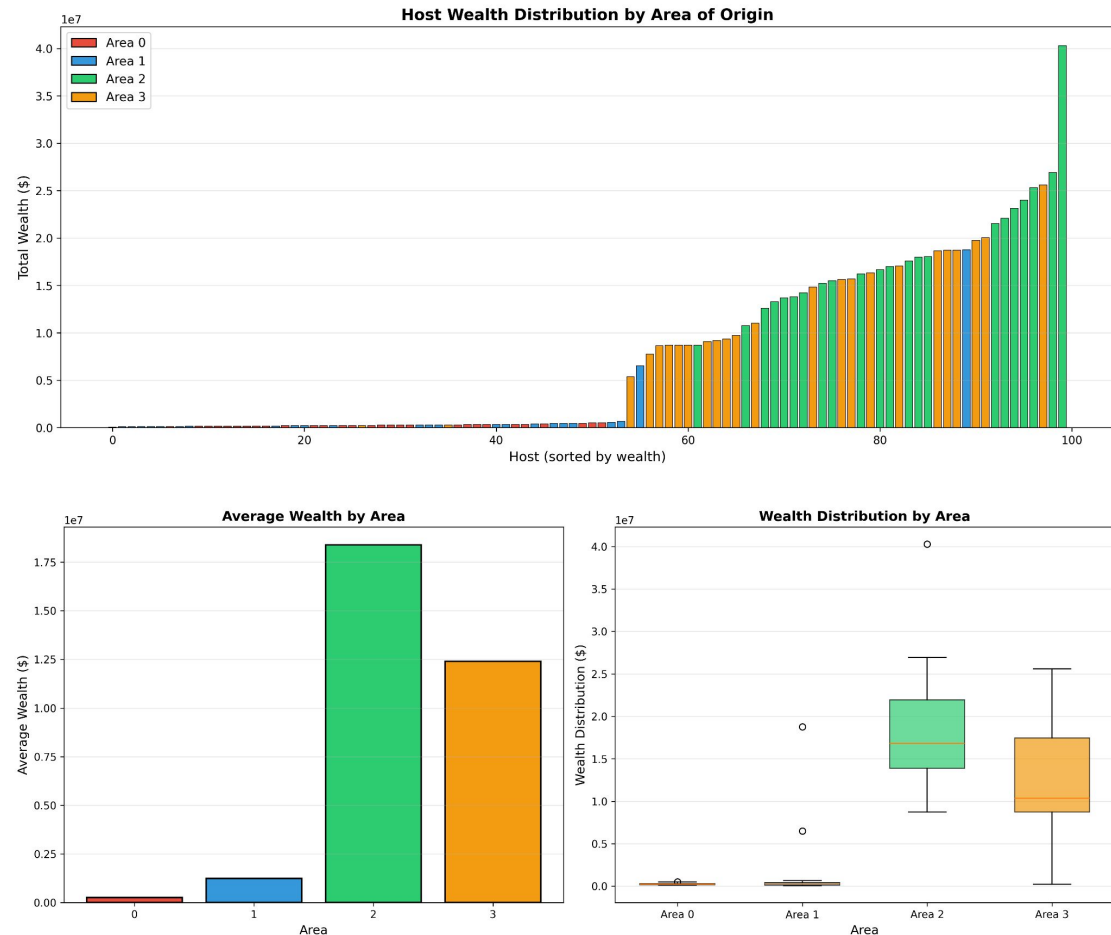
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Additional Graph from Part 1

- This figure illustrates the emergent **wealth dynamics** under the original simulation rules.
- Key Insight:** Hosts from higher-rate areas (Area 2 and 3) accumulate extreme wealth, demonstrating structural imbalance driven by initial rate heterogeneity.



Rule Change Snippet

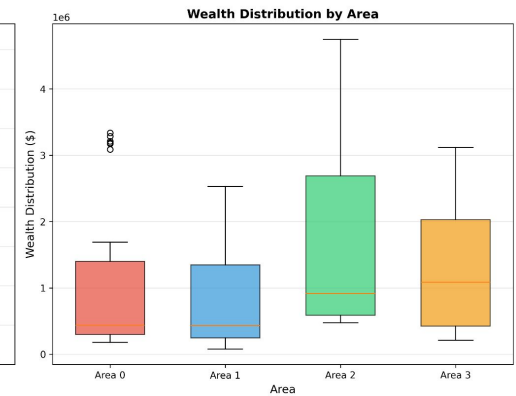
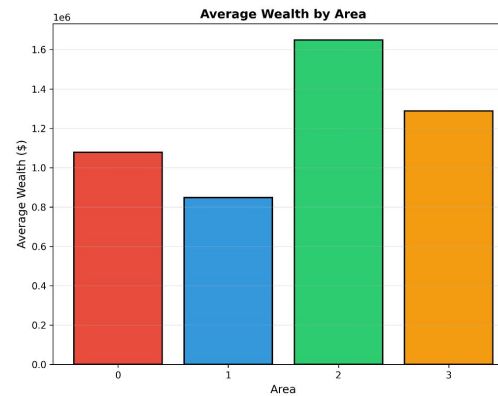
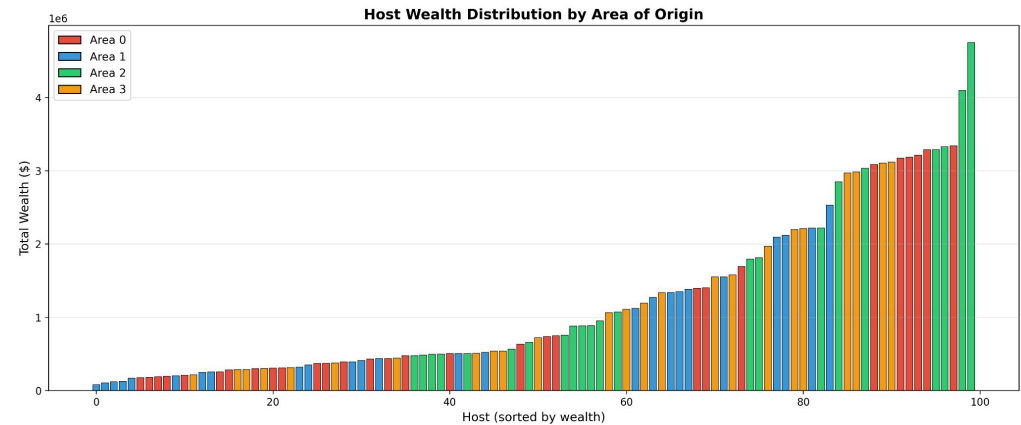
- We restricted bidding to properties within the same area to curb unrealistic cross-area expansion.
- Expected Effect: Greater regional specialization and reduced extreme concentration.

```
# If host's available profits are greater than or equal to asking price
if self.profits >= ask_price:
    # Create a bid dictionary
    bid = {
        'place_id': opportunity_id,
        'seller_id': opportunity_place.host_id,
        'buyer_id': self.host_id,
        'spread': self.profits - ask_price,
        'bid_price': self.profits
    }
    bids.append(bid)
```

```
# If host's available profits are greater than or equal to asking price
if self.profits >= ask_price:
    if opportunity_place.area != self.area:
        # Different area and rule is active → skip this opportunity
        continue
    # Create a bid dictionary
    bid = {
        'place_id': opportunity_id,
        'seller_id': opportunity_place.host_id,
        'buyer_id': self.host_id,
        'spread': self.profits - ask_price,
        'bid_price': self.profits
    }
    bids.append(bid)
```

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Part 2: Listing Concentration Analysis

- Using Barcelona (2025) and Berlin datasets, we examined host concentration.
- Motivation: Understand whether market power is similarly concentrated across cities.
- Finding: Barcelona exhibits significantly stronger concentration.

