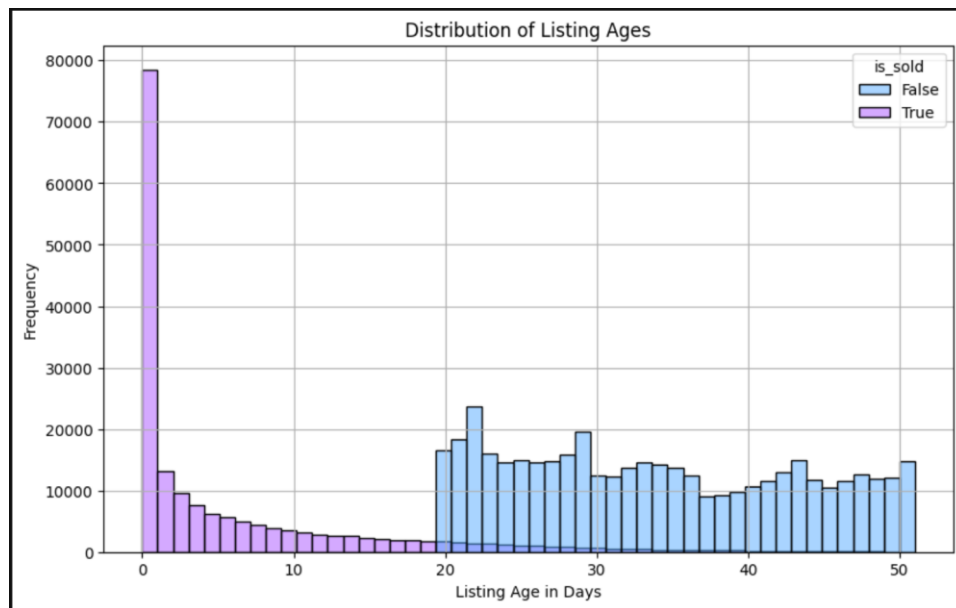


Section I: Defining Liquidity

A: Even though suggested definition of STR wouldn't be a bad metric for overall liquidity measurement, it is still misleading, due to number of factors.

STR as Total sold listings / All listings: 29.22%

- Time sensitivity: it is not correct to treat listings that are sold in one day and ones in 30 days as the same thing.
- Fresh listings: items that were put on the market recently can skew STR (maybe they didn't have enough time to be sold).
- Misleading nature can be confirmed by graph indicating frequency of items sold by listing age:



B, C: From the graph above we can see that majority of unsold listings are older than 30 days, and probably they did not have enough chance to be sold. So, it can be tried calculating STRs of listings that are older and younger than 30 days.

STR for listings older than 30 days: 1.8 %

STR for listings younger than 30 days: 48.55 %

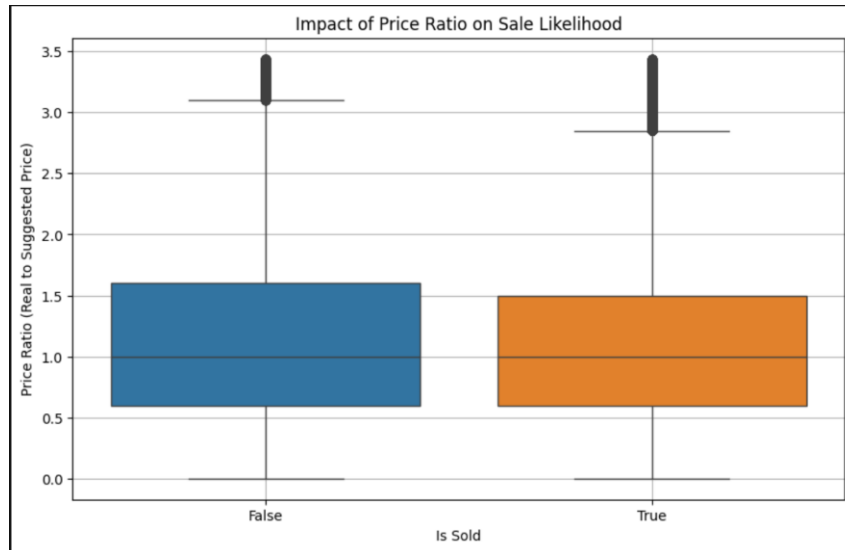
D: Possible factors influencing Liquidity:

- Price of Listing: Listings priced closer to market expectations (e.g., near the suggested price) might sell faster.
- Item Condition: Items in better condition are generally more attractive and may sell quicker.
- User Feedback and Reputation: if the amount of positive feedback correlates with higher STR.

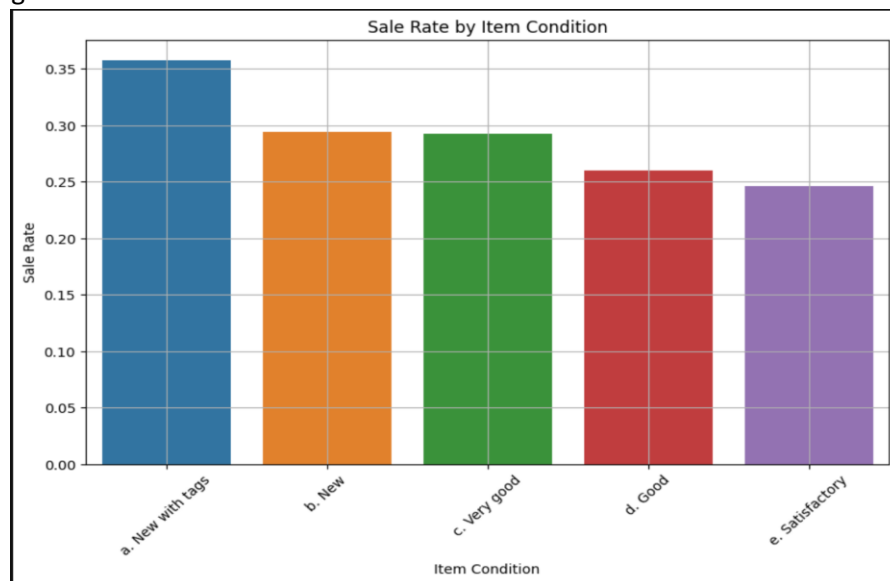
Section II: Modeling Liquidity

A: Hypotheses testing

- Price of Listing: Though it can be observed that sold listing tend to be closer to the suggested price (tend to 1), it is still not clear whether there is a difference. Further testing can be concluded to decide if the difference is significant.



- Item Condition: Though it can be observed that sold listing tend to be closer to the suggested price (tend to 1), it is still not clear whether there is a difference. Further testing can be concluded to decide if the difference is significant.

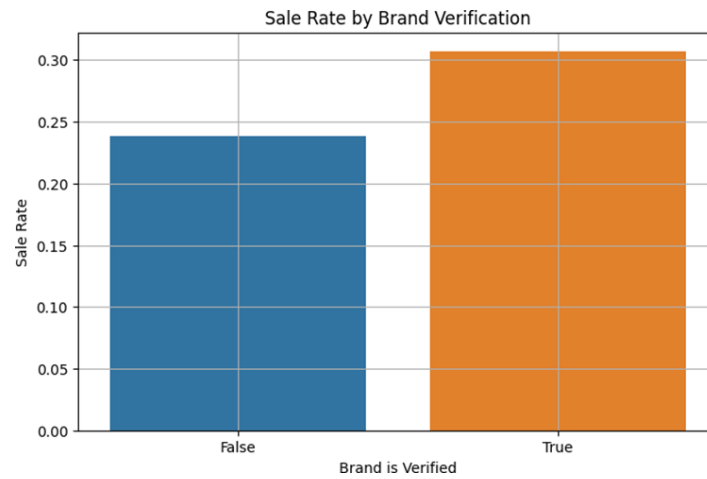


- User Feedback and Reputation: The correlation coefficient between the total positive feedback count and the likelihood of a listing being sold is ~ 0.056 (weak positive correlation). This can indicate that while more positive feedback might increase the likelihood of sales, the effect may not very strong or may be insignificant.

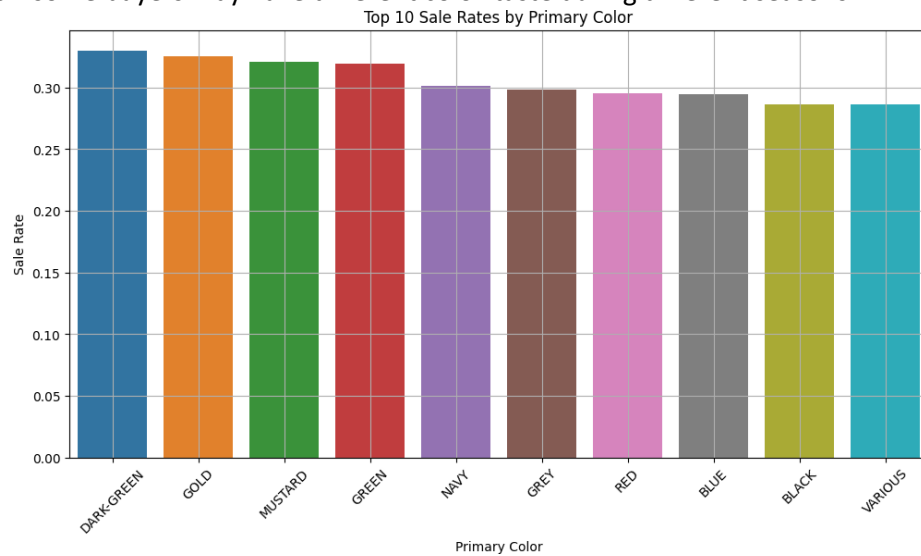
	total_positive_feedback_count	is_sold
total_positive_feedback_count	1.000000	0.055541
is_sold	0.055541	1.000000

B: Potential Factors:

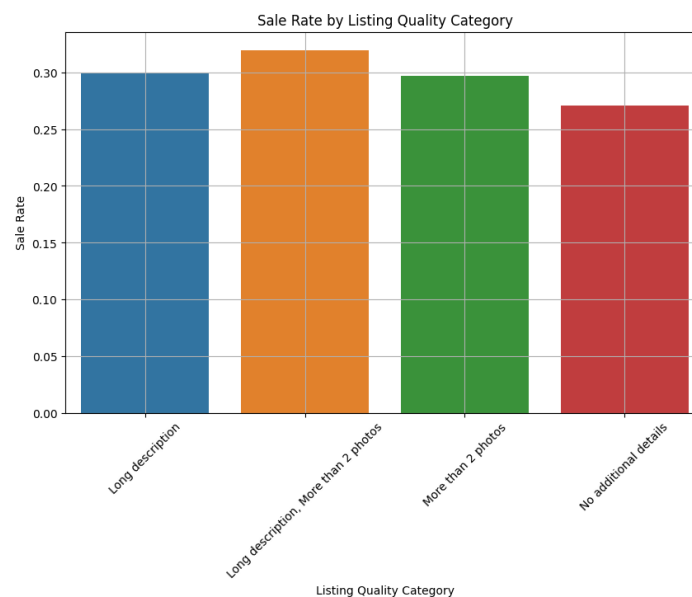
- Brand Verification: if brand is verified it might impact buyer trust thus leading to higher sale probability.



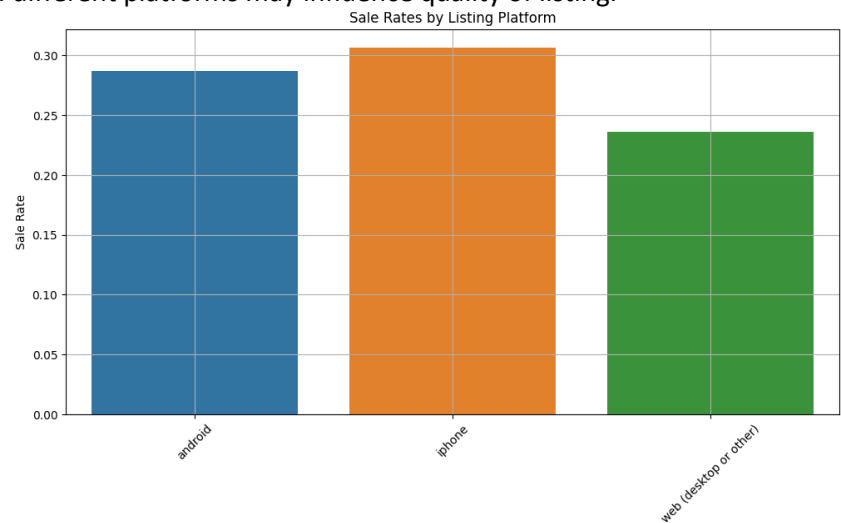
- Primary Color: some buyers may have different color-taste during different seasons.



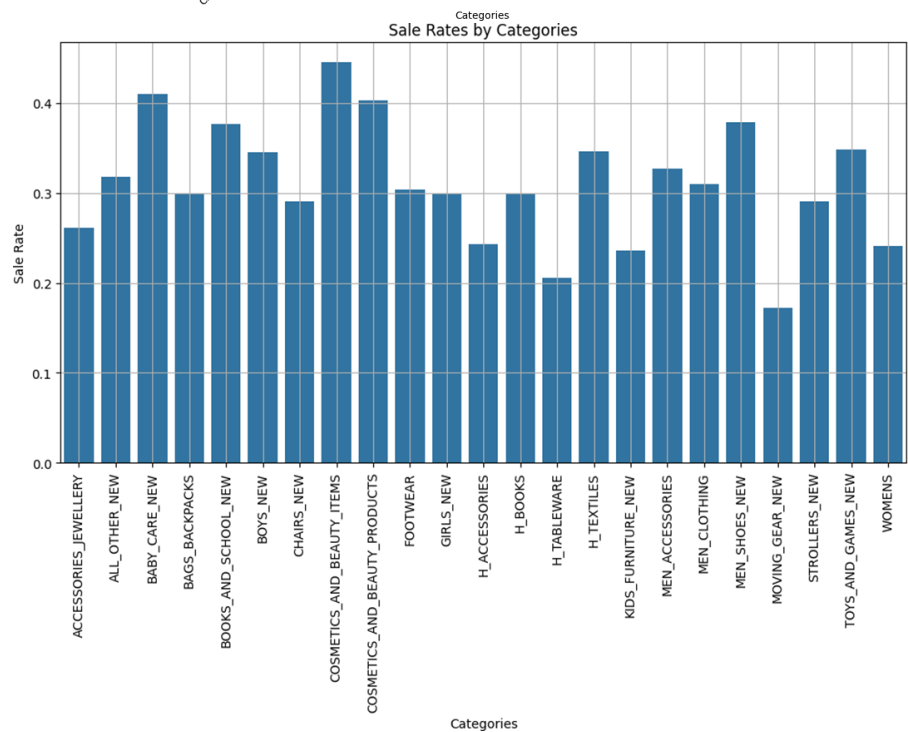
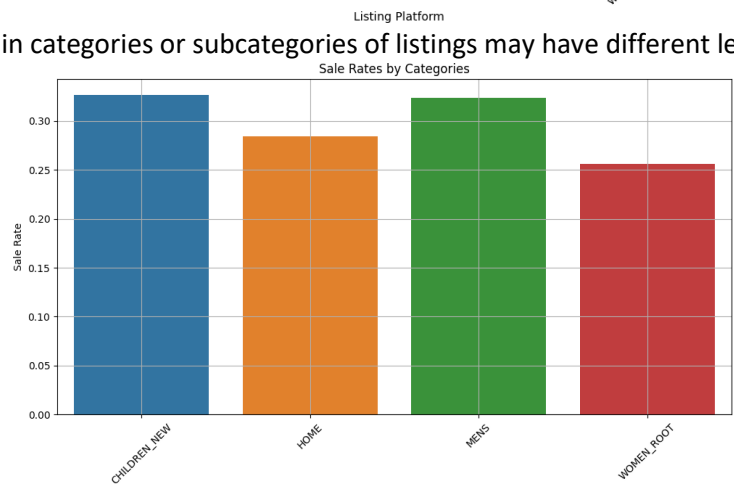
- Listing Quality: bigger description or more photos might influence buyer trust or just lead to a higher sale probability.



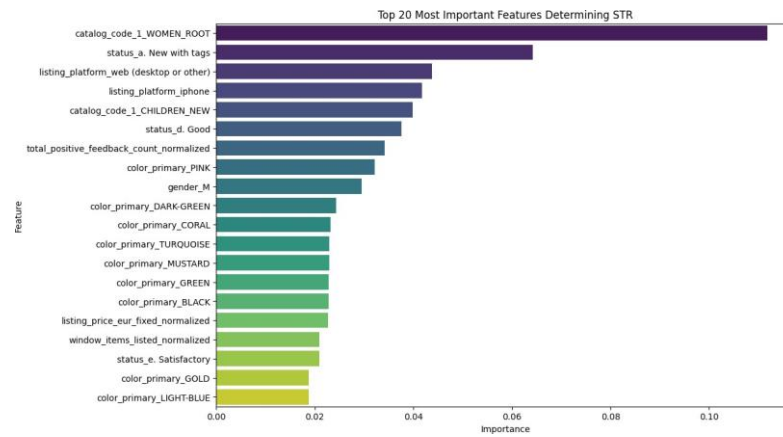
- Listing Platform: different platforms may influence quality of listing.



- Catalog Codes: certain categories or subcategories of listings may have different levels of demand.



C, D: After model implementation and training we get those features:



E: Ways to improve:

- Feature Enhancement: exploring further into features and trying to come up with new feature metrics.
- Model Tuning: trying to adjust parameters of model, like tree depth, learning rate, etc.
- Data Quality: exploring if data is not clean and if so - better validating that data is clean.

Section III: Improving Liquidity

Features to focus on:

- Catalog Codes: especially ones like (WOMEN_ROOT, CHILDREN_NEW, HOME), as they seem to impact liquidity significantly. For example, further enhance appearance and attractiveness of those categories.
- Listing Quality: promote or highlight listings with good descriptions, as they probably will sell better.
- Listing Platform: improve experience for users on platforms which lag behind in importance and STR.

Concrete applications:

- Catalog Codes: create marketing campaigns for important categories to further attract more buyers and increase STR.
- Listing quality: provide some tutorials to user on how to create a good quality listing, showcasing that listings with good descriptions are sold quicker.
- Listing platforms: further analyze why there is a difference between STRs and feature importance of different platforms. Upon finding more insight experience between different platforms can be optimized.