Heroes of Pymoli Analysis Report
By Charles Zhao

1.   Introduction

This report presents the findings of the structured in-game purchased data. It consists of a series of purchase records with women and men of various ages. Every item they brought was recorded with different purchased ID.

	Purchase ID	SN	Age	Gender	Item ID	Item Name	Price
0	0	Lisim78	20	Male	108	Extraction, Quickblade Of Trembling Hands	3.53
1	1	Lisovynya38	40	Male	143	Frenzied Scimitar	1.56
2	2	Ithergue48	24	Male	92	Final Critic	4.88
3	3	Chamassasya86	24	Male	100	Blindscythe	3.27
4	4	Iskosia90	23	Male	131	Fury	1.44

Figure 1:Top 5 rows of data using the head() function

The purpose of this analysis report is to conduct many types of purchase analysis to further help the game company gain key insights into customers and make more profits on them.

2.   Analysis

This session includes all the analysis conducted for the purchase data. The tools mainly used are Python, Jupyter Notebook, and the Pandas library. Data were aggregated and analyzed to view trends in the purchasing behaviour of the players

2.1.   Player Count

	Total Players
0	576

Figure 2: Total Player

To calculate the total players. It is important to use the Pandas unique function to drop duplicated Names in the "SN" column. There are 576 total players.

2.2.   Purchasing Analysis (Total)

	Number of Unique Items	Average Price	Number of Purchases	Total Revenue
0	183	$3.05	780	$2,379.77

Figure 3: Total Purchasing Analysis

Overall, there are 183 unique items in this market. The average price of all 780 purchases is $3.05. The total revenue is $2379.77.

2.3.   Gender Demographics

	counts	percentage
Male	484	84.03%
Female	81	14.06%
Other / Non-Disclosed	11	1.91%

Figure 4: Gender Demographics

According to Figure 4, this game has 484 male players and 81 female players. 84.03% of players are male as it shows in the pie graph(Figure 5)
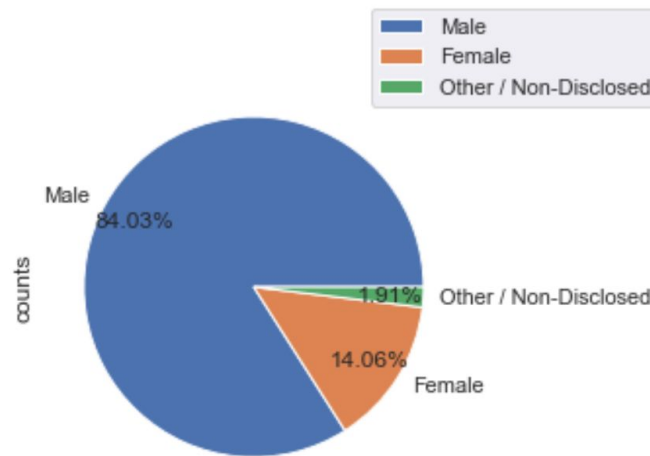

Figure 5: Gender Demographics pie graph

2.4. Purchasing Analysis (Gender)

	Purchase Count	Average Purchase Price	Total Purchase Value	Avg Total Purchase perPerson
Female	113	$3.20	$361.94	$4.47
Male	652	$3.02	$1,967.64	$4.07
Other / Non-Disclosed	15	$3.35	$50.19	$4.56

Figure 6 Gender Purchasing Analysis

Male players contribute to 82.7% (see Figure 7) of the total value(Revenue of the game). Female players made more purchases than male players in terms of purchase per person. In other words, Female has more purchase power per person in this game. Every female player joins this game could bring more revenues than every male player on average.
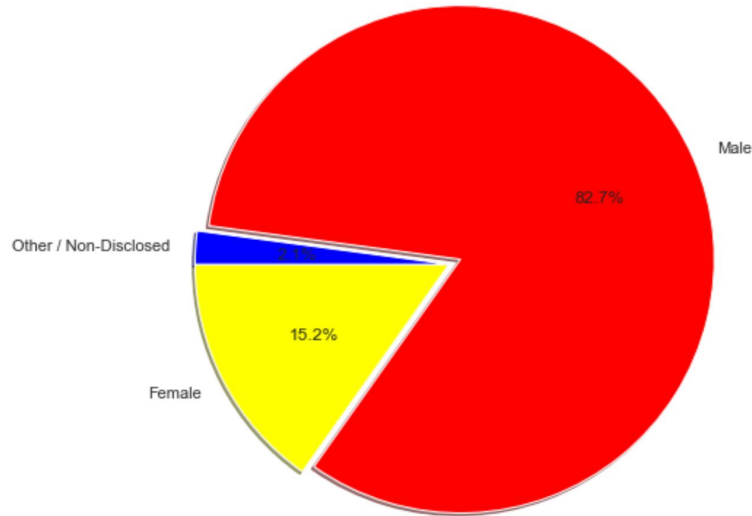
Figure 7: Gender total purchase value pie graph

2.5.   Age Demographics

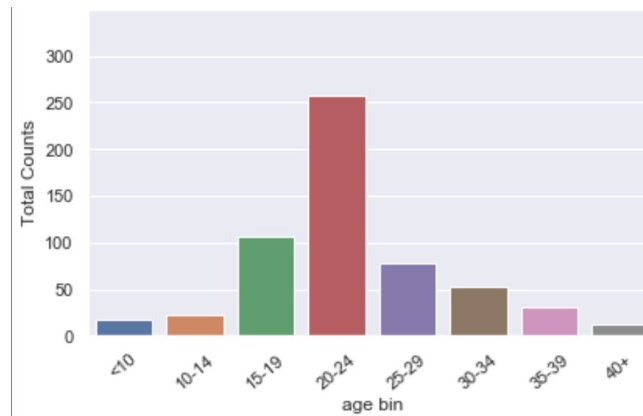|	Total Counts	Percentage of Players
age bin		
<10	17	2.95%
10-14	22	3.82%
15-19	107	18.58%
20-24	258	44.79%
25-29	77	13.37%
30-34	52	9.03%
35-39	31	5.38%
40+	12	2.08%

Figure 8: Age Demographics

Figure 9: Age Demographics bar chart

44.79% of players in this game (258 players) are between 20 and 24 years old, which is the largest player age group in this game. Players from 15 to 29 years old are 76.74% of total players.

2.6. Purchasing Analysis

age bin	Purchase Count	Average Purchase Price	Total Purchase Value	Avg Total Purchase perPerson
<10	23	$3.35	$77.13	$4.54
10-14	28	$2.96	$82.78	$3.76
15-19	136	$3.04	$412.89	$3.86
20-24	365	$3.05	$1,114.06	$4.32
25-29	101	$2.90	$293.00	$3.81
30-34	73	$2.93	$214.00	$4.12
35-39	41	$3.60	$147.67	$4.76
40+	13	$2.94	$38.24	$3.19

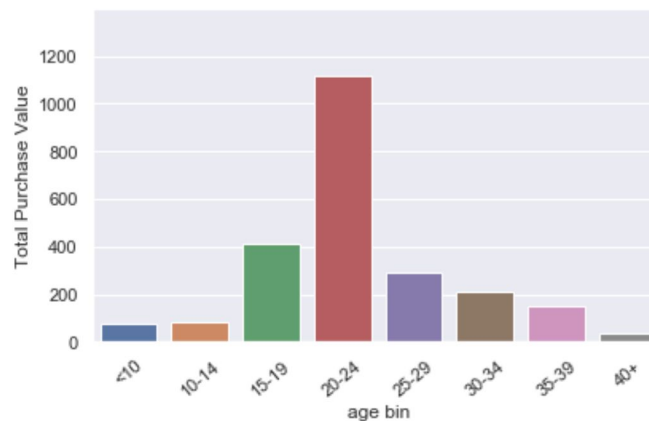Figure 10: Purchasing Analysis

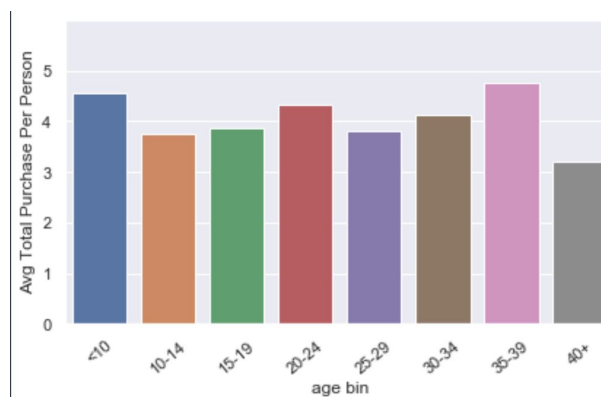

Figure 11: Total Purchasing Analysis among age groups

Figure 12: Average Purchasing Analysis Per Person among age groups

Players from 20 to 24 years old(44.79%) make $1114.06 purchase(46.3% of total revenue) in this game. And surprisingly that players from 35 to 39 years old make the highest purchase value per person.

2.7. Top Spenders

	Purchase Count	Average Purchase Price	Total Purchase Value
Lisosia93	5	$3.79	$18.96
Idastidru52	4	$3.86	$15.45
Chamjask73	3	$4.61	$13.83
Iral74	4	$3.40	$13.62
Iskadarya95	3	$4.37	$13.10

Figure 13: Top 5 Spenders

These top 5 spenders(see Figure 13) contribute to 3.15% of the total purchase.

2.8. Most Popular Items

Item ID	Item Name	Purchase Count	Item Price	Total Purchase Value
178	Oathbreaker, Last Hope of the Breaking Storm	12	$4.23	$50.76
145	Fiery Glass Crusader	9	$4.58	$41.22
108	Extraction, Quickblade Of Trembling Hands	9	$3.53	$31.77
82	Nirvana	9	$4.90	$44.10
19	Pursuit, Cudgel of Necromancy	8	$1.02	$8.16

Figure 14: Most 5 popular items

These items are the top 5 popular items.

The top 5 popular items(with most purchase count) are
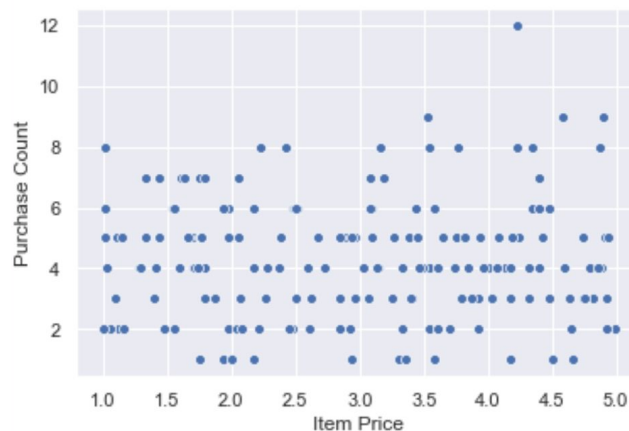

Figure 15: Scatter Plot

The scatter plot is built to study the relationship between the item price and the purchase count. There is no clear relationship between these two variables.

Interesting finding: one item name could have multiple item ids in this purchase data.

2.9. Most Profitable Items

Item ID	Item Name	Purchase Count	Item Price	Total Purchase Value
178	Oathbreaker, Last Hope of the Breaking Storm	12	$4.23	$50.76
82	Nirvana	9	$4.90	$44.10
145	Fiery Glass Crusader	9	$4.58	$41.22
92	Final Critic	8	$4.88	$39.04
103	Singed Scalpel	8	$4.35	$34.80

Figure 16: Most 5 profitable items

The top 5 profitable items(with highest total purchase value) are Oathbreaker, Last Hope of the Breaking storm, Nirvana, Fiery Glass Crusader, Final Critic and Singed Scalpel.
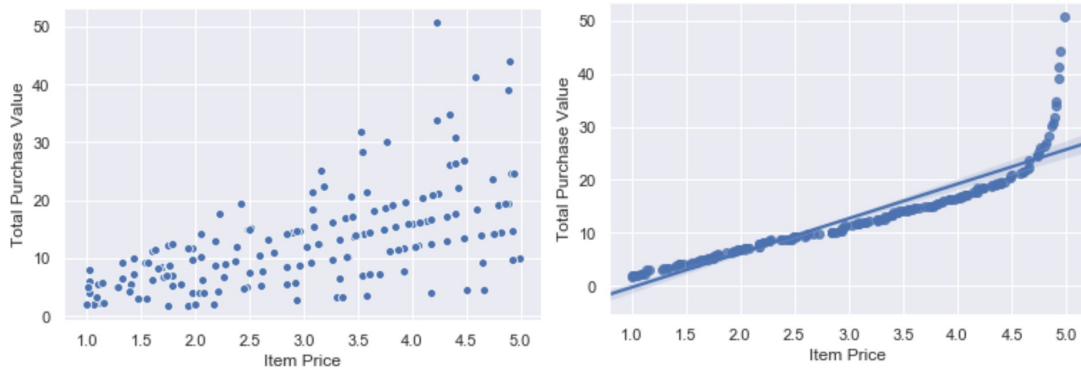

Figure 17: Scatter Plot (left) and the prediction function

A scatter plot is built to show the relationship between the item price and total purchase value. It looks like a linear relationship. And a linear regression plot is to fit the data.

3. Conclusion

The purchase data shows that this game purchase is doing well for the male players and age group from 20-24. When considering the advertising target audience, females and people from 35-39 should be prioritized for this game company because they have more purchasing power per person. In addition, when the developer wants to publish a new item in the game, the higher the item price is except above $4.5 the higher the total purchase value according to the plot.