Athena
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rz154
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1. [5pt] There are three key decisions to make in conjunction. Before performing any analysis, define the action alternatives and action standards for the first two decisions.

- *Which game should Athena pursue, if any?*

Athena should pursue the Seraph Guardians game.

Action alternatives:

1. Option A: Athena should pursue Warrior Guild
2. Option B: Athena should pursue Evercrest
3. Option C: Athena doesn't pursue any of the games

Action standards:

1. Potential Market: There is enough market and demand for the genre of the game.
2. Competitiveness: The game is able to remain competitive compared to the already in-market games in similar genres.
3. Resource: There is enough resource to be invested into developing the game and maintaining the game once launched.

- *How should the game be priced?*

The game should be priced at medium price so that Athena is able to enter the market smoothly, generating a relatively good profit instead of making a loss or experiencing a lack of demand.

Action alternatives:

- Option A: The game should be priced with high price
- Option B: The game should be priced with low price

Action standards:

1. Value proposition: The pricing is able to bring out the value of the product that can be perceived by the market.
2. Affordability: Our target market is able to afford our pricing of the game.
3. Profitability: We are able to make a profit based on the price, taking into account the market trend, fixed cost, and variable costs.

- *How should Athena position this game?*

Athena should first identify the unique value of the game and conduct value proposition analysis. From there, they can identify the target market and the consumers. After having a target, they would be able to design messages to offer the benefits of the product to these audiences. By creating engaging content through multiple channels, they will raise awareness for the game and drive the consumers down to the purchase funnel. After the game is launched, there needs to be frequent maintenance and social listening to make sure that Athena teams are gathering and handling feedback on time. This process also helps with refining the product for future growth opportunities.

2. [5pt] Using any of the resources from the class or the resources included with this assignment (but no external sources), determine the following.

- *What is the market size for the types of games Athena sells in 2019? How did you determine this number and which resources did you use?*

The market size for the types of games Athena sells in 2019 is $5.2B x 75% = $3.9B. According to "SuperData 2019 Year in Review", the market size for Premium PC, which is the type of games that Athena sells, is $5.2B. According to "Athena details", Athena distributes its games exclusively through Steam, which limits their market shares to 75% of the global market. Therefore, Athena's market share would be 75% of the global market of $5.2B, which is $3.9B.

- *What do you project the market size to be in 2020, ignoring COVID-19? Why?*

I project the market size to be $5.3B x 75% with slight projected growth to $4.0B. Similar to the previous question, Athena will have 75% of the global market when selling on Steam, and the global projected market is $5.3B in 2020. I anticipate some growth also occurring during the year, therefore, rounded the market size up to $4B from $3.975B.

- *How would you expect COVID-19 to impact this market? Moving forward, you may ignore any effects of COVID-19 on the market.*

I would expect COVID-19 to benefit the gaming market. With quarantines and lockdowns, people would have to stay at home and have extra time on their hands. This could lead to more game time and subsequent game purchases. In addition, social distancing would cause people to seek for more entertainment online, and the Premium PC type of game would be at its advantage because it offers people immersive experiences. There would not only be an increase in demand in games, but also PCs. Therefore, both industries need to be prepared to meet the demand and anticipate potential supply chain challenges that could arise due to delivery shortages in this challenging time.

3. [20pt] Your coworkers conducted a survey conducted with a sample of prior customers. The survey contained a series of 40 statements and participants rated these on a 7-point Likert scale; the survey statements may be found on page 4.

- *To identify potential segments in the market, first perform factor analysis. Include the factor loadings in your report. Name and interpret the factors. Identify the most relevant survey statements for each factor.*

My first step is factor analysis. After conducting Bartlett's Test and KMO-Test, here is my result:

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Bartlett's Test of Sphericity p-value: 0.0
KMO-test overall MSA: 0.8701380128313353
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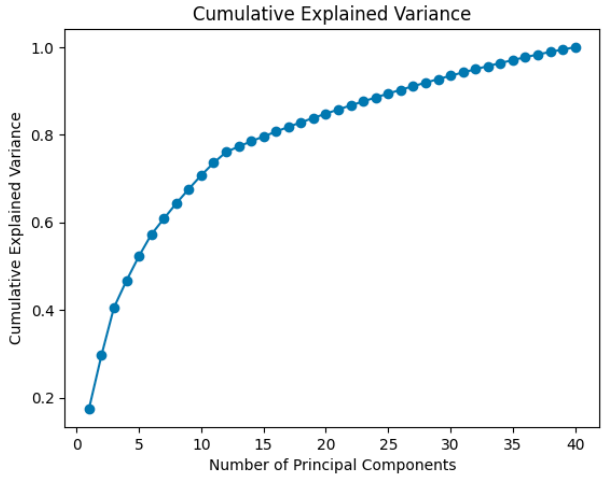
The p-value of 0.0 indicated that there is a statistically significant relationship between variables, and the correlations between variables are sufficiently large for factor analysis. KMO score of 0.87 is relatively close to 1, indicating that the Athena data is suitable for factor analysis. From there, I ran my PCA curve on the variables and took the eigenvalues that were greater than 1 by examining the elbow point.

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       1.99262917, 1.44379198, 1.39758246, 1.31343252, 1.25778586,
       1.13573613, 0.99262882, 0.49515349, 0.47821435, 0.44820805,
       0.44104524, 0.43468685, 0.41502891, 0.40116737, 0.3909749 ,
       0.38170652, 0.37762322, 0.36281221, 0.36170064, 0.35245708,
       0.34510457, 0.33208262, 0.32153735, 0.31991887, 0.31195317,
       0.30191319, 0.29213323, 0.28811272, 0.27834207, 0.27342393,
       0.26187468, 0.24805693, 0.23465604, 0.21797911, 0.21506989])
```

In total, there are 11 principal components greater than 1, indicating that these variables contribute significantly to explaining the variability in the Athena data. Therefore, I determined that there are 11 factors in this case.

I then loaded all 11 factors into our 40 statements of attributes mentioned in the survey, and conditional formatted their value.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10	Factor 11
imp.challenge	-0.0570655	-0.03397	0.2776542	-0.1263946	-0.1649616	0.0293876	0.0107558	0.0947701	-0.0290882	-0.0277108	-0.731341
imp.unlocks	0.031774	0.130731	-0.0880506	-0.1147441	0.0119188	0.0899882	0.8019336	0.0576039	0.0007758	-0.1799998	-0.0106133
imp.customize	0.1985793	-0.0645633	0.0397276	-0.13515	-0.1151722	-0.0160808	-0.0066511	-0.1072462	0.7724605	0.0093634	0.0080982
imp.difficulty	-0.0176416	-0.0267635	0.252903	-0.1418708	-0.1479625	0.0457954	0.0198544	0.0867363	0.0256993	-0.076325	-0.6985295
imp.characters	0.2681312	0.0935442	0.0273949	0.0007195	-0.0877536	0.0235035	-0.0358773	-0.7982388	0.0608979	-0.0075018	0.0511458
imp.storyline	0.2874494	0.0619643	0.0340962	-0.0181816	-0.0926732	-0.0098301	-0.0699051	-0.7762104	0.1317536	-0.0373457	0.0708893
imp.mastery	-0.027527	-0.0037247	0.5710132	-0.1114186	-0.1097711	0.0417159	-0.0889465	0.004515	0.0069723	0.0352324	-0.4600592
imp.backstory	0.2712395	0.0517459	0.0001844	-0.004459	-0.0987288	0.0490255	-0.0229013	-0.8023618	0.1040608	-0.0328557	0.0674482
imp.dominate	-0.0181535	-0.7288112	0.0309378	0.0027026	-0.0523753	-0.1575297	-0.1073012	0.0505898	0.0698373	0.1214811	-0.0257302
imp.completion	0.0152982	0.1611846	-0.0552747	-0.1233502	0.0404304	0.1064801	0.7603717	0.0473433	-0.0263468	-0.2016105	0.012979
imp.wealth	0.1816936	0.048875	0.0371367	-0.0604973	-0.1329804	-0.1217872	0.1056499	-0.0446625	0.2064556	-0.3069096	-0.0243636
imp.fantasy	0.7643849	0.0442558	0.0534001	-0.1158988	-0.1254385	0.0051489	-0.0110486	-0.1218469	0.1414538	-0.0352967	0.0107355
imp.items	0.6830932	0.0479301	0.0340806	-0.0764402	-0.1130167	0.0076953	9.68E-06	-0.3293279	0.1192858	-0.0751244	-0.0082228
imp.power	0.7471216	0.0163961	-0.0199433	-0.1062089	-0.110681	0.0504558	0.0312228	-0.1433016	0.1707192	-0.0356137	0.005346
imp.offbeat	0.1786104	-0.0045536	0.0863371	-0.0885685	-0.7343277	0.011699	-0.0441825	-0.106942	0.037742	0.0286042	-0.1474941
imp.collect	0.0312262	0.1573528	-0.0685057	-0.1167297	0.0386273	0.124817	0.7927843	0.0194927	-0.0001488	-0.1900062	-0.0034615
enj.excitement	0.001383	-0.1168653	0.0332852	0.134247	-0.0409735	-0.7291882	-0.0684211	0.0441297	0.0521822	0.0513767	0.0247082
enj.destruction	-0.1325402	-0.0278924	-0.1046787	0.7810058	0.1151269	-0.0875774	-0.0916598	-0.0084521	-0.0822115	0.0190114	0.0840997
enj.others	-0.0041205	-0.3207705	0.004518	0.0175972	-0.0480745	-0.0553597	-0.1803524	0.0164002	0.0731293	0.7143252	0.0336108
enj.react	0.0009029	-0.1196053	0.0261204	0.0890896	0.0188605	-0.7562624	-0.1190042	0.0308897	0.0062577	-0.0137864	0.0043572
enj.duels	-0.0792908	-0.7360081	-0.0201874	0.0710039	0.0002728	-0.1108833	-0.1816745	0.078173	0.0227525	0.2144449	0.0021156
enj.strategy	0.0082727	-0.0491459	0.8184493	-0.0749424	-0.1065668	-0.0333888	-0.0526904	-0.0190809	0.0152557	0.0061908	-0.0823303
enj.roleplay	0.7451753	0.0250561	-0.0142848	-0.0726712	-0.1530207	-0.0245435	0.0472257	-0.1627037	0.1532544	-0.0103896	0.0488831
enj.competition	-0.0622317	-0.7770878	-0.0182024	0.0654981	0.0059351	-0.1175171	-0.1504248	0.0734275	-0.0028004	0.2636474	-0.0231246
enj.decisions	0.0360246	0.0123124	0.7589011	-0.1275016	-0.082331	0.0188527	-0.0336865	-0.0439061	0.0013757	0.0196164	-0.120719
enj.common.goal	0.0007796	-0.1635902	0.0226336	0.0261246	-0.103025	-0.0643807	-0.150065	0.0104268	0.0561854	0.7948174	0.0365546
enj.planning	0.014089	0.0222016	0.7890959	-0.1185709	-0.0960284	-0.0418266	-0.0661432	-0.014245	0.0661434	0.0023417	-0.0995612
enj.immersion	0.7840465	0.0346162	-0.0100911	-0.0950709	-0.1374527	-0.0256661	0.0182469	-0.1420939	0.1347995	-0.039854	0.0197691
enj.helping	-0.0232303	-0.1136589	0.0704667	0.0058286	-0.0686087	-0.0634164	-0.1430706	0.0115806	0.0144128	0.7856661	-0.001803
enj.fast	-0.0053046	-0.0966896	-0.0384244	0.1101931	-0.0227708	-0.7063283	-0.0803412	-0.0194461	0.0479456	0.0221544	0.0453453
enj.guns	-0.0898004	-0.0322769	-0.1297979	0.7718194	0.1008361	-0.0919906	-0.0963793	0.0081434	-0.0798479	0.0536669	0.0795699
enj.gore	-0.0917778	-0.0365456	-0.11409	0.780901	0.1118729	-0.1154611	-0.1367687	0.0232134	-0.101512	0.025872	0.0946252
enj.blow.up	-0.1256946	-0.0440431	-0.1263821	0.7602317	0.0800034	-0.1052745	-0.0375968	0.011496	-0.1333562	0.0391885	0.0762295
freq.explore	0.1506005	-0.0099368	0.1305262	-0.0818615	-0.7663577	-0.0124598	-0.0569412	-0.0633998	0.1117809	0.0278939	-0.0592976
freq.experiment	0.1153416	0.0023856	0.1195323	-0.1208925	-0.7833721	-0.0129853	-0.0285639	-0.0412647	0.0605847	0.0670392	-0.0564502
freq.study	0.0032645	0.0344493	0.564066	-0.1148736	-0.1031107	0.0093136	0.0038375	0.0251989	0.0060026	-0.0241928	-0.4855922
freq.char.creation	0.2045257	-0.0368961	0.0305124	-0.0938171	-0.0874262	-0.0178952	-0.0179234	-0.0827292	0.732541	0.0095775	-0.0082334
freq.stats	0.1832108	0.0574357	0.111835	-0.109598	-0.0945843	-0.1507516	0.1012216	-0.0366882	0.1591046	-0.2863758	-0.0434264
freq.customize	0.2188279	-0.0133276	0.0024086	-0.1273152	-0.0708425	-0.0769991	-0.0190673	-0.0771465	0.7399755	-0.0004651	0.0035111
freq.test.world	0.1528528	-0.0499931	0.0833857	-0.1054553	-0.7870768	-0.048373	0.0402533	-0.067954	0.1038685	-0.0134732	-0.1022477

Based on the positive and negative factor scores, I summarized all 11 factors into the below table:

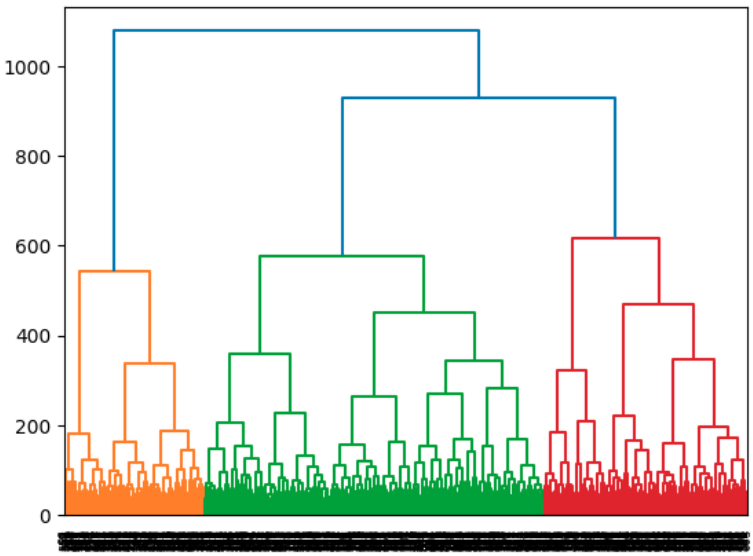
Factors	**Segment Name**	**Relevant Survey Statements**	**Interpretation**
Factor 1	Fantasy Empowerment	imp.fantasy imp.items Imp.power Enj.roleplay enj.immersion	This segment values immersive gaming experiences, powerful weaponry, and the ability to assume different roles within the game world.
Factor 2	Solo Players	Imp.dominate Enj.duels enj.competition	This segment prefers cooperative gameplay experiences, shows little interest in direct competition, and is less focused on dominating or engaging in duels with other players.
Factor 3	Strategic Mastery	Imp.mastery Enj.strategy Enj.decisions Enj.planning freq.study	This segment values games that promote mastery through practice and strategic planning. They enjoy games that require thoughtful decision-making and active studying.
Factor 4	Intense Action and Violence	enj.guns enj.gore	This segment shows preference for intense action, weaponry, gore, and destructive

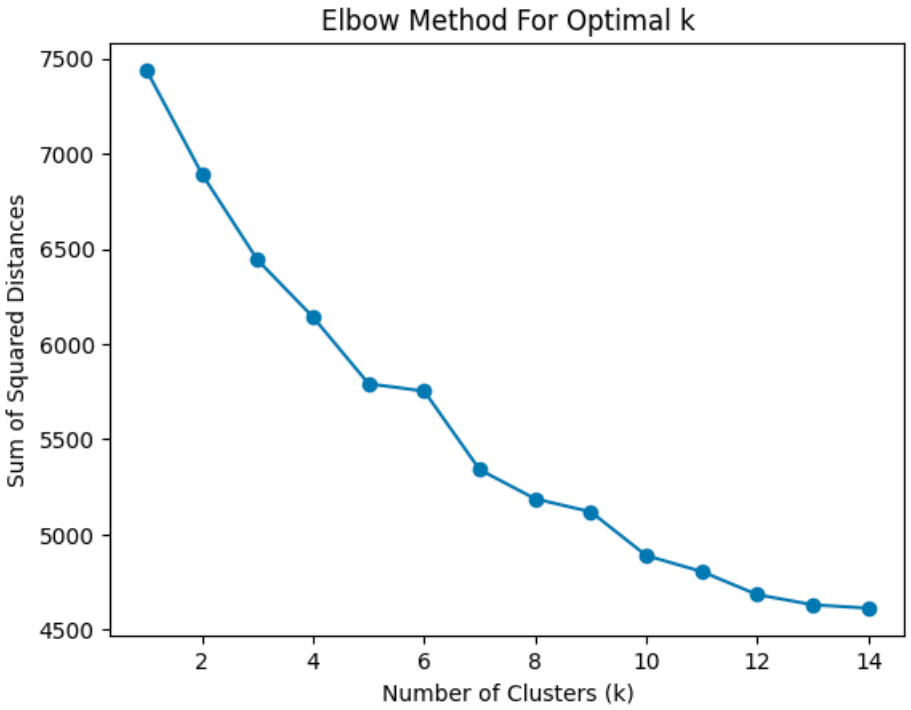
		enj.blow.up enj.destruction	elements.
Factor 5	Conventional Gameplay Preference	Imp.offbeat freq.explore freq.experiment freq.test.world	This segment prefers more traditional or conventional gameplay rather than unconventional or exploratory methods. They are less interested in experimenting or exploring the game world solely for the sake of discovery.
Factor 6	Slow-paced and Engaging Gameplay	Enj.excitement Enj.react enj.fast	This segment prefers a more relaxed, possibly slower-paced gaming experience, and less focused on constant action and quick reaction times.
Factor 7	Completionist and collection driven	Imp.unlocks Imp.completion imp.collect	This segment values unlocking achievements, completing missions, collecting in-game items that bring in excitement.
Factor 8	Averse to Elaborate Narratives	imp.characters Imp.storyline imp.backstory	This segment represents a user segment that doesn't prioritize elaborate character backgrounds, storylines, or deep backstories when engaging with games or content.
Factor 9	Enthusiastic Customizers	Imp.customize Freq.char.creation	This segment interests in customizing various aspects within games, such as characters,

		freq.customize	cities, or spaceships.
Factor 10	Collaborative Gamers	Enj.others Enj.common.goal enj.helping	This segment enjoys cooperative play, helping others, working towards common goals and doesn't particularly focus on wealth accumulation within games.
Factor 11	Casual and Relaxed Gamers	Imp.challenge Imp.difficulty Imp.mastery freq.study	This segment prefers less challenging or intensive gameplay experiences, showing little interest in mastering games or studying advanced strategies.

- *Next, perform cluster analysis using K-means clustering to identify segments. Include the cluster centers in your report. Name and interpret these segments based on these cluster centers. Identify the most relevant factors for each segment.*

After performing cluster analysis using K-means clustering, I determined 5 clusters for my segments.





From the graph, we can see that the curve starts to first flatten at 5 clusters. From there, I generated the cluster center table below:

Cluster Centers:

	Fantasy Empowerment	Solo Players	Strategic Mastery	Intense Action and Violence	Conventional Gameplay Preference	Slow-paced and Engaging Gameplay	Completionist and collection driven	Averse to Elaborate Narratives	Enthusiastic Customizers	Collaborative Gamers	Casual and Relaxed Gamers
Cluster 0	-0.873637	0.021871	-0.777755	1.174751	-0.014535	-0.070002	0.109999	-0.007986	-0.084569	0.062843	-0.043474
Cluster 1	-0.716224	0.514879	-0.193751	-0.937146	0.209360	-0.189985	0.162398	-0.139443	0.204987	-0.043925	0.102637
Cluster 2	0.569094	-0.957430	-0.267078	-0.231921	0.210124	0.497640	0.351483	-0.129713	0.027276	0.010934	-0.048150
Cluster 3	1.078023	0.643490	-0.265981	0.027275	-0.341994	-0.328388	-0.205675	-0.068054	-0.141332	-0.034534	0.001066
Cluster 4	-0.309454	-0.205155	1.216477	0.204957	-0.043608	0.072464	-0.349647	0.314945	-0.013848	0.018290	-0.017742

Cluster	Cluster 0	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Fantasy Empowerment	-0.873637007	-0.716224338	0.569094402	1.078022726	-0.30945392
Solo Players	0.021870738	0.514879117	-0.95742952	0.64349048	-0.20515539
Strategic Mastery	-0.77775474	-0.193750749	-0.267077551	-0.265981422	1.2164768
Intense Action and Violence	1.174750638	-0.937146403	-0.23192101	0.027275261	0.204957275
Conventional Gameplay Preference	-0.014535211	0.209359752	0.210123591	-0.341994307	-0.04360788
Slow-paced and Engaging Gameplay	-0.070001748	-0.189984887	0.497640377	-0.328387765	0.072464118
Completionist and collection driven	0.109999396	0.162397935	0.35148328	-0.205675216	-0.34964708
Averse to Elaborate Narratives	-0.007986209	-0.139443139	-0.129712861	-0.068054224	0.314945059
Enthusiastic Customizers	-0.084569258	0.204987407	0.027275623	-0.141332363	-0.01384752
Collaborative Gamers	0.06284256	-0.043924528	0.01093357	-0.034533562	0.018290037
Casual and Relaxed Gamers	-0.043473983	0.10263748	-0.048149836	0.001066438	-0.0177415

Based on the cluster's factor values, I assigned values for these clusters in the table below:

Clusters	**Cluster Name**	**Relevant Factors**	**Interpretation**
Cluster 0	Adrenaline Gamers	"Intense Action and Violence","Fantasy Empowerment", "Strategic Mastery"	This cluster prioritizes intense action, violence in their gaming experiences, and dislikes fantasy and strategy.
Cluster 1	Non-Violent Traditionalists	"Fantasy Empowerment", "Solo Players", "Intense Action and Violence"	This cluster prefers traditional gameplay but with a clear aversion to violence and fantasy. It mostly consists of solo players that enjoy collection and customization.
Cluster 2	Multi-player	"Solo Players",	This cluster prefers exploratory

	Explorers	"Slow-paced and Engaging Gameplay", "Fantasy Empowerment", "Completionist and collection driven"	gaming experiences and completing collections with a group at a slower pace.
Cluster 3	Fantasy Soloists	"Fantasy Empowerment", "Solo Players"	This cluster prefers fantasy-driven gameplay and leans towards solitary gaming experiences.
Cluster 4	Strategic Connoisseurs	"Strategic Mastery", "Solo Players"	This cluster prefers strategic mastery while showing disinterest in fantasy-driven gameplay and solo player experiences.

- *Finally, use cross tabulation and regression analysis to investigate the relationships between the segments and various demographic attributes (gender, age, income, location). Identify any significant relationships and describe each of the resulting segments in terms of their demographic attributes (% female, average age, and average income) regardless of statistical significance.*

From the analysis graphs below, we are able to observe that out of the 5 clusters, the Multi-player Explorer cluster has the highest female proportion, regardless of statistical significance. The Adrenaline Gamers cluster has the lowest female proportion, which is not surprising as this cluster prefers violence and intense action in their gaming experiences.

Cluster	Adrenaline Gamers	Fantasy Soloists	Multi-player Explorers	Non-Violent Traditionalists	Strategic Connoisseurs	Total
gender						
female	54	80	93	72	78	377
male	72	94	77	92	102	437
nonbinary	3	3	1	1	5	13
Total	129	177	171	165	185	827

Cluster	Adrenaline Gamers	Fantasy Soloists	Multi-player Explorers	Non-Violent Traditionalists	Strategic Connoisseurs	Total
gender						
female	0.4186	0.4520	0.5439	0.4364	0.4216	0.4559
male	0.5581	0.5311	0.4503	0.5576	0.5514	0.5284
nonbinary	0.0233	0.0169	0.0058	0.0061	0.0270	0.0157
Total	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

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Chi-squared value: 10.586772060306407
P-value: 0.226229918930682
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	Cluster	Adrenaline Gamers	Fantasy Soloists	Multi-player Explorers	Non-Violent Traditionalists	Strategic Connoisseurs
gender						
female	Observed	54	80	93	72	78
	Expected	58.81	80.69	77.95	75.22	84.33
	Chi squared	0.39	0.01	2.9	0.14	0.48
male	Observed	72	94	77	92	102
	Expected	68.17	93.53	90.36	87.19	97.76
	Chi squared	0.22	0.0	1.98	0.27	0.18
nonbinary	Observed	3	3	1	1	5
	Expected	2.03	2.78	2.69	2.59	2.91
	Chi squared	0.47	0.02	1.06	0.98	1.5

Chi-squared value: 126.12488208670158
P-value: 1.7960138881289724e-23

agegroup	Cluster	Adrenaline Gamers	Fantasy Soloists	Multi-player Explorers	Non-Violent Traditionalists	Strategic Connoisseurs
Adults (35 and above)	Observed	20	64	0	15	17
	Expected	18.09	24.83	23.99	23.14	25.95
	Chi squared	0.2	61.81	23.99	2.87	3.09
Highschooler (0-20)	Observed	25	18	65	43	41
	Expected	29.95	41.09	39.7	38.31	42.95
	Chi squared	0.82	12.98	16.12	0.57	0.09
Young Adults (20-35)	Observed	84	95	106	107	127
	Expected	80.96	111.08	107.31	103.55	116.1
	Chi squared	0.11	2.33	0.02	0.12	1.02

In addition, when examining the segments by age group, we can see that none of the age groups for Adrenaline Gamers are statistically significant. For Fantasy Soloist Cluster, the data is significant when the age group is 35 and above. This aligns with the average age group table that will be discussed below. The Multi-player Explorer cluster also showed significance in results for the age group of 35 and above and highschooler. However, neither the Non-violent Traditionalist cluster nor the Strategic Connoisseurs are significant.

In addition, the Multi-player Explorers cluster has the youngest average age and the lowest average income, versus the Fantasy Soloists cluster has the oldest average age and the highest average income.

Cluster	Average Age	Average Income
Adrenaline Gamers	27.627907	54775.193798
Fantasy Soloists	34.615819	71593.220339
Multi-player Explorers	22.830409	37321.637427
Non-Violent Traditionalists	26.000000	47109.090909
Strategic Connoisseurs	26.232432	48254.054054

When looking at different income groups, we can see that none of the income groups for the Adrenaline Gamers Cluster is significant, while all income groups are significantly

represented in the Fantasy Soloist segment and the Multi-player Explorer segment. Only the high income group for the Non-violent Traditionalist segment is statistically significant.

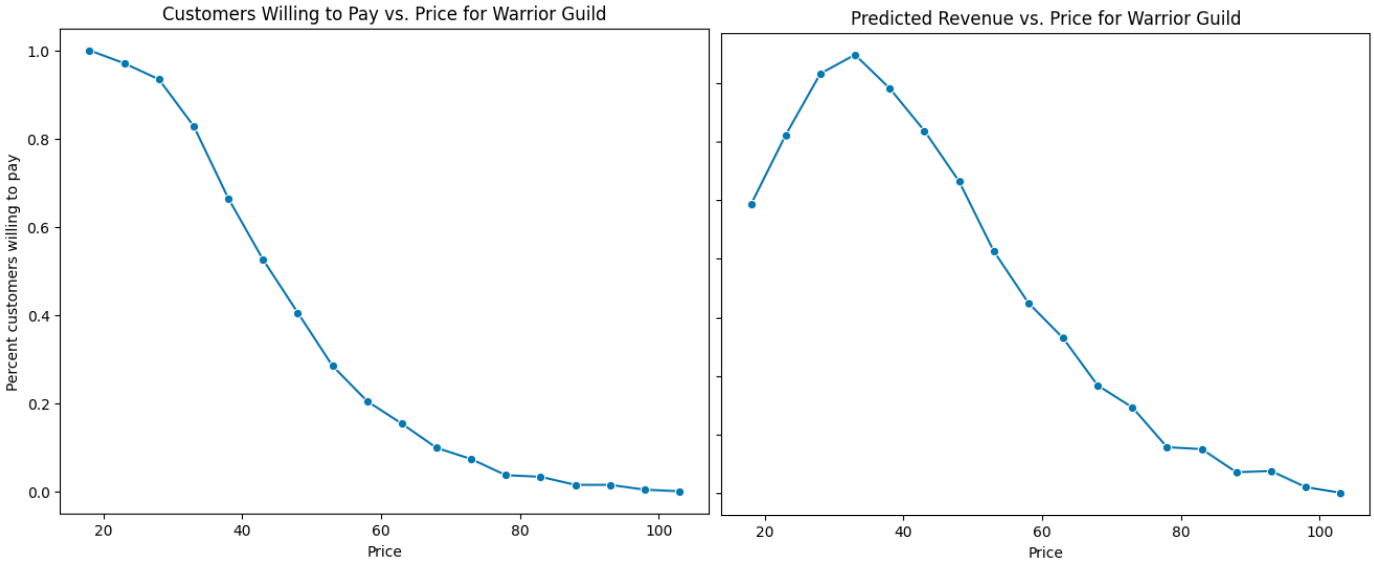
```
Chi-squared value: 106.25219970637757
P-value: 2.2394785731765334e-19
```

	Cluster	Adrenaline Gamers	Fantasy Soloists	Multi-player Explorers	Non-Violent Traditionalists	Strategic Connoisseurs
incomegroup						
High Income	Observed	22	52	6	11	20
	Expected	17.31	23.76	22.95	22.15	24.83
	Chi squared	1.27	33.58	12.52	5.61	0.94
Low Income	Observed	62	47	127	89	98
	Expected	65.98	90.53	87.46	84.4	94.63
	Chi squared	0.24	20.93	17.87	0.25	0.12
Mid Income	Observed	45	78	38	65	67
	Expected	45.7	62.71	60.58	58.46	65.54
	Chi squared	0.01	3.73	8.42	0.73	0.03

4. Next, investigate another part of the survey: Gabor Granger responses for each game. Each respondent was randomly presented with one of the three games and the survey identified the maximum price point at which each respondent would "probably purchase" the presented game.

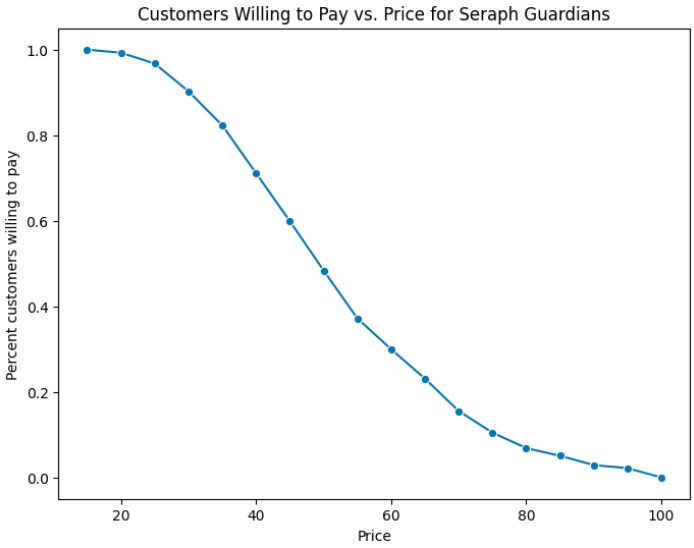
- *For each game, show the two Gabor Granger plots: percent customers willing to pay and predicted revenue as a function of price. What is the ideal price point for each game?*

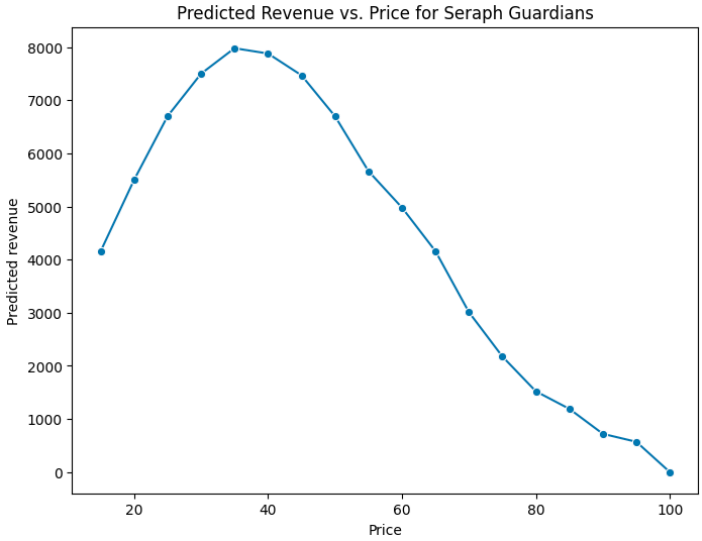
For Warrior Guild, the ideal price point is $33, as it is the highest revenue in response to the highest per customer willing to pay price.




```
{'Warrior Guild':    price  per_customers_wtp pred_revenue
 0     18           1.000000         4932
 1     23           0.970803         6118
 2     28           0.934307         7168
 3     33           0.828467         7491
 4     38           0.664234         6916
 5     43           0.525547         6192
 6     48           0.405109         5328
 7     53           0.284672         4134
 8     58           0.204380         3248
 9     63           0.153285         2646
 10    68           0.098540         1836
 11    73           0.072993         1460
 12    78           0.036496          780
 13    83           0.032847          747
 14    88           0.014599          352
 15    93           0.014599          372
 16    98           0.003650           98
 17   103           0.000000            0,
```

For Seraph Guardians: the ideal price point is $35, as it is the highest revenue in response to the highest per customer willing to pay price.

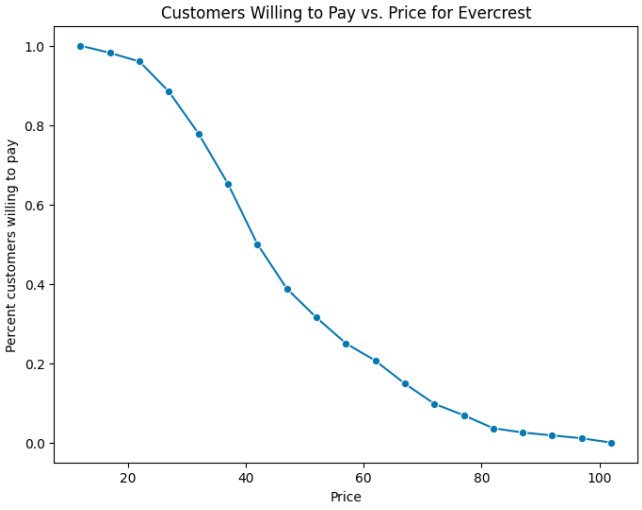


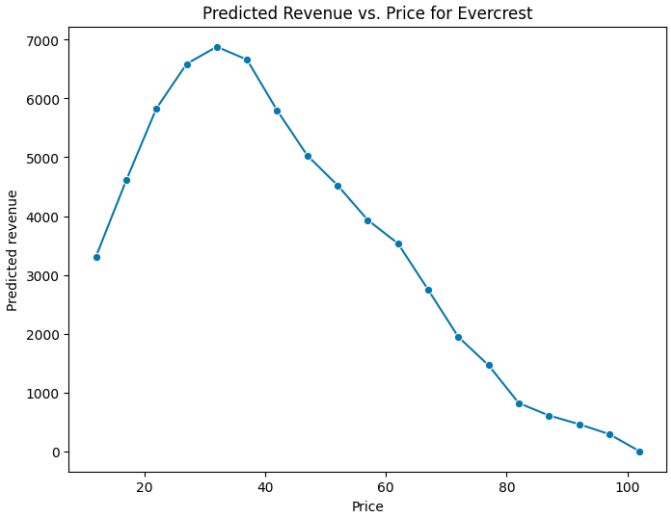


'Seraph Guardians':

	price	per_customers_wtp	pred_revenue
0	15	1.000000	4155
1	20	0.992780	5500
2	25	0.967509	6700
3	30	0.902527	7500
4	35	0.823105	7980
5	40	0.711191	7880
6	45	0.599278	7470
7	50	0.483755	6700
8	55	0.371841	5665
9	60	0.299639	4980
10	65	0.231047	4160
11	70	0.155235	3010
12	75	0.104693	2175
13	80	0.068592	1520
14	85	0.050542	1190
15	90	0.028881	720
16	95	0.021661	570
17	100	0.000000	0,

For Evercrest: the ideal price point is $32, as it is the highest revenue in response to the highest per customer willing to pay price.






```
'Evercrest':    price  per_customers_wtp pred_revenue
0      12           1.000000         3312
1      17           0.981884         4607
2      22           0.960145         5830
3      27           0.884058         6588
4      32           0.778986         6880
5      37           0.652174         6660
6      42           0.500000         5796
7      47           0.387681         5029
8      52           0.315217         4524
9      57           0.250000         3933
10     62           0.206522         3534
11     67           0.148551         2747
12     72           0.097826         1944
13     77           0.068841         1463
14     82           0.036232          820
15     87           0.025362          609
16     92           0.018116          460
17     97           0.010870          291
18    102           0.000000            0}
```

- *Use linear regression to predict which segment is most interested in each game (willing to pay the most). Which segments are most and least interested in each game?*

Warrior Guild: The Fantasy Soloist cluster is more likely to pay the most for this game, thus the most interested. The Multi-player explorer cluster is willing to pay the least for this game, thus the least interested.

OLS Regression Results

Dep. Variable:	gg.maxprice	R-squared:	0.114
Model:	OLS	Adj. R-squared:	0.101
Method:	Least Squares	F-statistic:	8.626
Date:	Sat, 16 Dec 2023	Prob (F-statistic):	1.45e-06
Time:	08:37:14	Log-Likelihood:	-1122.9
No. Observations:	274	AIC:	2256.
Df Residuals:	269	BIC:	2274.
Df Model:	4		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
Adrenaline Gamers	50.4865	2.418	20.882	0.000	45.727	55.246
Fantasy Soloists	54.0806	1.868	28.956	0.000	50.404	57.758
Multi-player Explorers	40.5692	1.824	22.241	0.000	36.978	44.161
Non-Violent Traditionalists	42.6154	2.039	20.896	0.000	38.600	46.631
Strategic Connoisseurs	44.3276	1.931	22.956	0.000	40.526	48.129

Omnibus:	21.598	Durbin-Watson:	2.046
Prob(Omnibus):	0.000	Jarque-Bera (JB):	24.308
Skew:	0.696	Prob(JB):	5.27e-06
Kurtosis:	3.441	Cond. No.	1.33

Seraph Guardians: The Fantasy Soloist cluster is more likely to pay more for this game, thus the most interested. The Non-Violent Traditionalist cluster is willing to pay the least for this game, thus the least interested.

OLS Regression Results

Dep. Variable:	gg.maxprice	R-squared:	0.124
Model:	OLS	Adj. R-squared:	0.112
Method:	Least Squares	F-statistic:	9.628
Date:	Sat, 16 Dec 2023	Prob (F-statistic):	2.71e-07
Time:	08:37:14	Log-Likelihood:	-1169.3
No. Observations:	276	AIC:	2349.
Df Residuals:	271	BIC:	2367.
Df Model:	4		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
Adrenaline Gamers	46.1887	2.320	19.909	0.000	41.621	50.756
Fantasy Soloists	57.7407	2.298	25.122	0.000	53.216	62.266
Multi-player Explorers	41.3333	2.438	16.955	0.000	36.534	46.133
Non-Violent Traditionalists	40.0185	2.298	17.411	0.000	35.493	44.544
Strategic Connoisseurs	43.0000	2.063	20.839	0.000	38.938	47.062

Omnibus:	24.942	Durbin-Watson:	2.195
Prob(Omnibus):	0.000	Jarque-Bera (JB):	29.411
Skew:	0.795	Prob(JB):	4.11e-07
Kurtosis:	3.169	Cond. No.	1.18

Evercrest: The Fantasy Soloist cluster is more likely to pay the most for this game, thus the most interested. The Strategic Connoisseurs cluster is willing to pay the least for this game, thus the least interested.

OLS Regression Results

Dep. Variable:	gg.maxprice	R-squared:	0.173
Model:	OLS	Adj. R-squared:	0.161
Method:	Least Squares	F-statistic:	14.26
Date:	Sat, 16 Dec 2023	Prob (F-statistic):	1.41e-10
Time:	08:37:15	Log-Likelihood:	-1160.8
No. Observations:	277	AIC:	2332.
Df Residuals:	272	BIC:	2350.
Df Model:	4		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
Adrenaline Gamers	49.5641	2.583	19.186	0.000	44.478	54.650
Fantasy Soloists	64.5574	2.066	31.253	0.000	60.491	68.624
Multi-player Explorers	48.1379	2.118	22.724	0.000	43.967	52.308
Non-Violent Traditionalists	46.1864	2.100	21.990	0.000	42.051	50.321
Strategic Connoisseurs	45.6667	2.083	21.926	0.000	41.566	49.767

Omnibus:	10.836	Durbin-Watson:	2.186
Prob(Omnibus):	0.004	Jarque-Bera (JB):	11.228
Skew:	0.492	Prob(JB):	0.00365
Kurtosis:	3.076	Cond. No.	1.25

- *Assume that only 30% of respondents who indicated they would "probably purchase" at a given price will actually do so within the first year. Also assume that the survey sample was representative of the approximately 10 million active Steam customers who have expressed interests in similar types of games. What would be the gross and net revenues for each game in the first year?*

Assuming 30%*10,000,000 customers would actually purchase: 3,000,000 total users. Below is a cost breakdown of the gross and net revenues for each game in the first year, taking into account all the ideal price points, fixed cost, variable costs, and administrative cost.

Profit Break Down	Warrior Guild	Seraph Guardians	Evercrest	Total Users
Price Point	$ 33	$ 35	$ 32	3000000
Growth Profit	$ 99,000,000	$ 105,000,000	$ 96,000,000	
Fixed Cost	$ (7,000,000)	$ (7,000,000)	$ (7,000,000)	
Development Cost	$ (5,000,000)	$ (5,500,000)	$ (6,000,000)	
Royalty Cost	$ (4,950,000)	$ (5,250,000)	$ (4,800,000)	
Valve Sales Fees	$ (22,800,000)	$ (24,000,000)	$ (22,200,000)	
Net Profit	$ 59,250,000	$ 63,250,000	$ 56,000,000	

5. [10pt] The final portion of the part of the survey asked respondents to rank six games with 1 being the most preferred choice. The six games include the three candidate games and three games that competitors have already announced will be on the market.

- *Assuming all the games are priced equally, that the surveyed customers are representative of the market, and that each customer purchases only one game, calculate the percentage of the market share Athena would have under each of the action alternatives.*

Based on the calculations, below is the market share for each game.

```
rank.WarriorGuild       11.970979
rank.SeraphGuardians    53.808948
rank.Evercrest          10.157195
rank.DevilsGate         16.203144
rank.Marksman            1.451028
rank.QuestoftheTitan     6.408706
dtype: float64
```

- *Discuss which of the assumptions above you might want to change, and in what ways, to generate more realistic estimates of market share under each of the action alternatives. Extra Credit: modify your simulation to actually change some or all of the assumptions you discuss and share the results.*

I would change the assumption that each customer purchases only one game to 30% of the customers actually purchasing more than one game. Because in reality, game lovers won't purchase solely one game. Below is be the simulation result:

```
Adjusted Market Share (Considering customers buying multiple games):
rank.WarriorGuild       17.101399
rank.SeraphGuardians    76.869926
rank.Evercrest          14.510278
rank.DevilsGate         23.147348
rank.Marksman            2.072897
rank.QuestoftheTitan     9.155295
```

6. [10pt] Provide your final recommendations for each of the key decisions (part 1). As part of your recommendation on positioning, indicate whether you recommend targeting particular segment(s) or a non-targeting strategy. If you recommend a targeted approach, indicate which segment(s) should be targeted and justify your response. If you recommend a non-targeted approach, similarly justify your response. (top funnel and low funnel - ad copy specified for ppl who are interested in)

My final recommendation would be to choose the Seraph Guardians game and target primarily the segment of Fantasy Soloist with a lower funnel approach, and running top funnel approach simultaneously for all segments. The reason for the game choice is that Seraph Guardians generates the most growth and net revenue for Athena. Seraph Guardians also have the biggest market share despite market simulations. The Fantasy Soloist segment is the one that we would want to primarily target, as it represents gamers who embrace diverse gaming experiences, value engaging gameplay, and prioritize fantasy and solo play. This group also enjoys some battle elements, immersive experience, and excitement that comes from personalization. This group is the ideal type for the Seraph Guardians. More reasons why we choose this segment and focus on conversion is because the gamers in this group have already shown their inclination to Seraph Guardians. Therefore, with a low funnel message, these gamers are very likely to convert and make the purchase. This segment also represents the most statistically significant age groups and income groups, with the oldest average age and the highest income of $71,593 out of all the segments. This is beneficial for Athena in terms of consumer loyalty, as younger groups could be hesitant to purchase PC premium games like this and are also very likely to churn. Therefore, this segment is a good investment for low funnel strategy, because it is highly likely to generate the best return on ad spend and maximize

Athena's revenue. For all segments, I also recommend top funnel approach because when a new game enters the market, we would want to raise the awareness of as many gamers as possible. Some other segments also have shown traits that might be suitable for this game. Therefore, for this funnel, we would mainly measure the performance by impressions and clicks. Top Funnel ad copies will include social, online video, and connected TV to engage our audience into the gaming world through captivating gaming video creatives. Low Funnel will target those who have clicked on our top funnel videos and those that have played similar genre games on Steam before. This tailored approach aims to optimize our marketing resources while significantly increasing awareness and interest in Seraph Guardians among its dedicated gaming community.