ASSIGNMENT -2

- Vishanth Hari Raj 206310279

Part (A) Product affinity based segmentation:

Q1/Q2 : characteristics of the affinity based segment for Product 3/1/2

	pPr30	pPr10	pPr05	pIn0.5	pIn1	pIn3	pCp12	pCp20	pCp32	pClD	pClF	pClE	pCnSl	pCnSp
Product 1	1	4.919876	7	1	4.020961	7	3.266504	5.366698	3.789076	1	4.868985	7	1	3.85035
Product 2	1	5.666979	7	1	4.133281	7	3.108512	5.337524	3.970306	1	5.037719	7	1	4.127197
Product 3	1	5.01549	7	1	3.914327	7	3.096495	5.32783	3.879569	1	4.870364	7	1	3.780847
Overall Mean	1	5.266881	7	1	4.041801	7	3.154341	5.344051	3.890675	1	4.942122	7	1	3.951768

pCnLk	pBrA	pBrB	pBrC	IPr	Iin	ICp	ICl	Icn	IBr	income	age	sports	gradschl
7	5.429532	3.500791	3.040357	18.04779	13.35601	16.3604	18.47495	20.65696	13.11693	60.16628	46.71115	0.470745	0.359619
7	2.896781	4.608242	4.403476	38.9822	8.963664	12.16314	14.56583	12.40045	12.89139	49.63578	42.84952	0.168137	0.24789
7	3.891631	3.608785	4.463553	25.95776	11.13901	12.19932	21.12871	16.64859	12.96653	57.7432	46.4733	0.448284	0.448373
7	3.938907	4.006431	3.996785	29.1254	10.88746	13.47267	17.47588	16.05788	12.98071	54.99678	44.98392	0.334405	0.334405

Log-lifts for all variables for the affinity based segment :

	pPr30	pPr10	pPr05	pIn0.5	pIn1	pIn3	pCp12	pCp20	pCp32	pClD	pClF	pClE	pCnSl	pCnSp
Product 1	0	-0.0296	9.64E-17	0	-0.00225	9.64E-17	0.015175	0.001837	-0.01149	0	-0.00648	9.64E-17	0	-0.01129
Product 2	0	0.031798	9.64E-17	0	0.00972	9.64E-17	-0.00636	-0.00053	0.008799	0	0.00832	9.64E-17	0	0.018864
Product 3	0	-0.02124	9.64E-17	0	-0.01392	9.64E-17	-0.00804	-0.00132	-0.00124	0	-0.00635	9.64E-17	0	-0.0192

pCnLk	pBrA	pBrB	pBrC	IPr	Iin	ICp	ICl	Icn	IBr	income	age	sports	gradschl
9.64E-17	0.139387	-0.05859	-0.11879	-0.20785	0.08875	0.08434	0.024144	0.109378	0.004534	0.039016	0.016363	0.148513	0.03157
9.64E-17	-0.13346	0.060778	0.042085	0.126594	-0.08444	-0.04441	-0.0791	-0.11225	-0.003	-0.04454	-0.02111	-0.29861	-0.13001
9.64E-17	-0.00524	-0.0454	0.04797	-0.05	0.00992	-0.04312	0.082434	0.015689	-0.00047	0.021164	0.014146	0.12728	0.127366

Q3:
Product 1 (Brand A): IPr (Importance of Price): -0.208 (Consumers less price sensitive)
Iin (Importance of Insulation Time): 0.089 (Greater importance on insulation time)
ICp (Importance of Capacity): 0.084 (Greater importance on capacity)
Icn (Importance of Containment): 0.109 (Greater importance on containment)
Sports: 0.149 (Higher likelihood of being sports active)

Product 2 (Brand B): IPr (Importance of Price): 0.127 (Consumers more price sensitive)
Iin (Importance of Insulation Time): -0.084 (Lower importance on insulation time)
Icn (Importance of Containment): -0.112 (Lower importance on containment)
Sports: -0.299 (Lower likelihood of being sports active)
Gradschl (Graduate School Education): -0.130 (Lower likelihood of having a master's degree or higher)
The regular noteworthy log-lifts (between 0.04 and 0.08) weren't present, indicating that the characteristics of these segments either do not differ notably from the average or differ very notably.

Product 1 (Brand A) Segment: "Active Adrian"
Adrian represents the active lifestyle consumer who is not deterred by higher price points when it comes to finding the right product. He values the technical features of his gear, like the insulation time that keeps his drinks at the right temperature throughout his outdoor activities and the capacity to stay hydrated without constant refills. The containment feature is also a top priority, as he wants to avoid spills during his hikes or while at the gym. Being sports-active, Adrian is the type of consumer who's always on the move and looking for durable products that match his dynamic lifestyle.

Product 2 (Brand B) Segment: "Practical Paula"
Paula is budget-conscious and always on the lookout for the most cost-effective options. She prioritizes the practicality of a product over advanced features. Insulation time is not her primary concern as she prefers convenience and tends to consume her beverages shortly after preparation. Paula may be a professional or a student who is still contemplating further education, which is reflected in her more frugal approach to purchases. Sports are not her main activity, and she seeks straightforward solutions that fit her pragmatic day-to-day life.

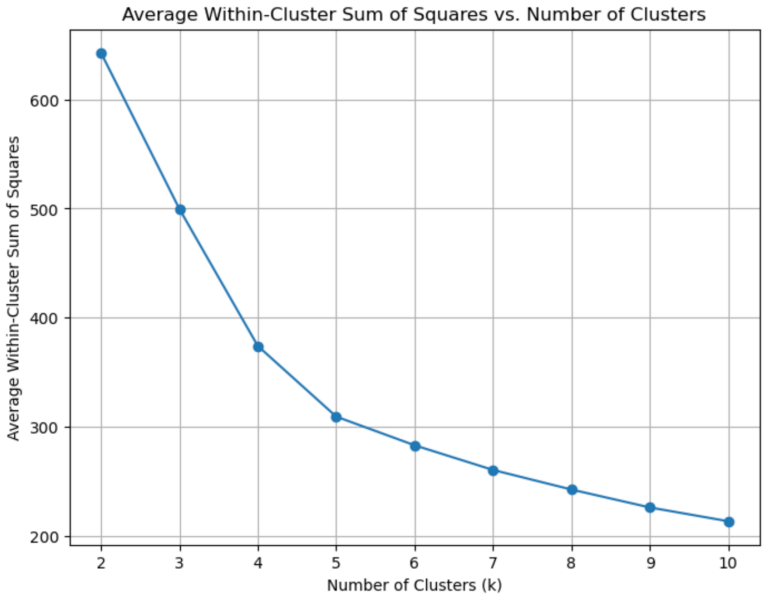
By understanding these personas, Brand C can tailor its product development and marketing strategies to address the specific needs and preferences of each segment. For "Active Adrian," Brand C could focus on high-performance products with enhanced features, while for

"Practical Paula," the emphasis could be on affordability and basic functionality. This approach ensures that the marketing message resonates with the target audience and that the product offerings are aligned with their expectations.

Product 3 (Brand C) Segment: "Best Brain"
Brain is the discerning customer who seeks out the best in every category, not just by brand association but by the merit of the product's features. He values highly insulated mugs to keep his coffee hot for hours as he delves into his work or leisure reading. For Brain, a mug's capacity speaks to its ability to support him through long sessions at his desk or in meetings without the need for constant refills. He appreciates well-designed containment that prevents any spills on his important papers or tech devices. While not necessarily the most sports-active, Brain enjoys an active social life or hobbyist endeavours that may require the same level of product reliability. His appreciation for higher education and continuous learning is reflected in his choice of sophisticated products that align with his lifestyle.
For Brand C, targeting Brain would mean offering a product that not only stands out in terms of quality and design but also bears a brand image of sophistication and intelligence.

PART -2 :

Graph for selecting optimal K: In our case, the elbow appeared around k=5, suggesting that increasing the number of clusters beyond this point would lead to diminishing returns in terms of the reduction in within-cluster variance. With five clusters, we reached a balance between having a manageable number of distinct segments and achieving a relatively high level of homogeneity within each segment. It was the point where each additional cluster didn't contribute significantly more to explaining the variance within the data, indicating that k=5 was the most efficient choice for segmentation.



Q1/2: Characteristics in terms of the average value, for each segment

Segment	pPr30	pPr10	pPr05	pIn0.5	pIn1	pIn3	pCp12	pCp20	pCp32	pClD	pClF	pClE	pCnSl	pCnSp	pCnLk
Segment 0	1	5.556338	7	1	4.049296	7	2.852113	5.169014	4.225352	1	4.859155	7	1	3.915493	7
Segment 1	1	4.727273	7	1	4.606061	7	3.363636	4.787879	3.939394	1	4.515152	7	1	3.484848	7
Segment 2	1	5.190476	7	1	3.97619	7	2.761905	5.428571	4.285714	1	4.952381	7	1	4.547619	7
Segment 3	1	4.9	7	1	4.075	7	4.375	6	2.825	1	5.15	7	1	4.1	7
Segment 4	1	5.166667	7	1	3.703704	7	3.222222	5.592593	3.462963	1	5.259259	7	1	3.759259	7

pBrA	pBrB	pBrC	IPr	Iin	ICp	ICl	Icn	IBr	income	age	sports	gradschl	tage of Cust
2.640845	4.119718	5.176056	46.42958	7.964789	8.78169	12.59155	11.34507	12.88732	47.40141	42.22535	0.105634	0.288732	45.65916
4.939394	4.181818	2.636364	16.0303	29.57576	12.30303	14.36364	14.60606	12.9697	58.75758	45.21212	0.666667	0.363636	10.61093
6	3.571429	2.547619	12.88095	8.571429	9.714286	12.2381	43.16667	13.57143	62.38095	46.85714	0.357143	0.285714	13.50482
5.8	3.775	2.375	13.65	9.45	41.975	10.975	11	12.85	59.1	44.825	0.275	0.025	12.86174
3.759259	4.111111	4.055556	15.72222	10.01852	8.333333	41.11111	12	12.87037	63.88889	50.75926	0.759259	0.703704	17.36334

Log-Lift

Segment	pPr30	pPr10	pPr05	pIn0.5	pIn1	pIn3	pCp12	pCp20	pCp32	pClD	pClF	pClE	pCnSl	pCnSp	pCnLk
Segment 0	0	0.023235	0	0	0.000805	0	-0.04374	-0.01446	0.035838	0	-0.00735	0	0	-0.00401	0
Segment 1	0	-0.04694	0	0	0.056755	0	0.0279	-0.04773	0.005404	0	-0.03924	0	0	-0.05461	0
Segment 2	0	-0.00635	0	0	-0.00711	0	-0.0577	0.006815	0.041998	0	0.000901	0	0	0.060993	0
Segment 3	0	-0.03136	0	0	0.003553	0	0.142069	0.050281	-0.13901	0	0.017894	0	0	0.015992	0
Segment 4	0	-0.00834	0	0	-0.03794	0	0.009247	0.019743	-0.05058	0	0.027011	0	0	-0.02169	0

pBrA	pBrB	pBrC	IPr	Iin	ICp	ICl	Icn	IBr	income	age	sports	gradschl
-0.17363	0.01211	0.112288	0.202523	-0.13575	-0.18588	-0.14236	-0.15088	-0.00314	-0.06455	-0.02748	-0.50047	-0.06378
0.098298	0.018607	-0.18071	-0.25933	0.434009	-0.03944	-0.08517	-0.04116	-0.00037	0.028727	0.002198	0.299636	0.036394
0.182776	-0.04992	-0.19558	-0.35432	-0.10387	-0.14204	-0.15473	0.42946	0.019327	0.054715	0.017718	0.028569	-0.06834
0.168052	-0.02584	-0.22605	-0.32914	-0.06149	0.493537	-0.20203	-0.1643	-0.0044	0.03125	-0.00154	-0.08494	-1.12633
-0.02027	0.011202	0.00634	-0.26776	-0.03612	-0.20863	0.37152	-0.12651	-0.00371	0.065088	0.052458	0.356117	0.323117

Q3

Segment 0:
Lower Importance in Attributes: This segment shows notably lower importance and preference across several attributes (e.g., ICp, ICl, Icn), suggesting they are less concerned about specific product features.
Lower Sports Activity: Significantly less likely to be sports active.
Income and Age: Slightly lower than the overall average, which may indicate a more price-sensitive or younger demographic.

Segment 1:
Higher Importance of Price and Cleanability: More sensitive to price with high log-lift in IPr, showing a tendency to value cost over other attributes.
Sports and Graduate School: More likely to be sports active and have a graduate degree, indicating a possibly more affluent and health-conscious demographic.

Segment 2:
High Importance of Containment (Icn): Far more concerned with containment features than the average, possibly indicating a need for very reliable or secure products.
Moderately Higher Income and Age: Reflects a possibly more established, possibly family-oriented demographic.

Segment 3:
Exceptional Importance of Capacity (ICp): This segment values larger capacities highly, which might indicate preferences for products that can hold more or serve longer usage without refilling.
Lower Graduate School Rate: Significantly lower levels of graduate education, potentially indicating different lifestyle or professional needs.

Segment 4:
High Importance of Cleanability (ICl): Indicates a preference for easy-to-maintain products, possibly due to a busier lifestyle or higher standards for convenience and usability.
Higher Sports Activity and Graduate School: The most educationally advanced and physically active, suggesting a demographic that values health and education highly.

PERSONA:

Segment 0: "Budget-Friendly Becky"
Becky is a young professional early in her career. She is less concerned with premium features, focusing instead on practical, budget-friendly options that provide basic functionality without the frills. While she enjoys a casual jog, her lifestyle isn't centered around athletic pursuits, preferring social gatherings and city explorations. Becky is looking for a reliable, no-nonsense mug that won't break the bank but will comfortably fit into her fast-paced, urban life.

Segment 1: "Active Professional Pat"
Pat is a mid-career professional with a higher-than-average income and a keen interest in maintaining a healthy, active lifestyle. Pat is sporty, likely found cycling on weekends, and holds an advanced degree. While cost-aware, Pat appreciates the value that comes from products offering cleanability and durability. For Pat, a mug that can withstand the rigors of an active lifestyle, yet is easy to clean and priced right, aligns perfectly with a busy schedule and a fitness-oriented life.

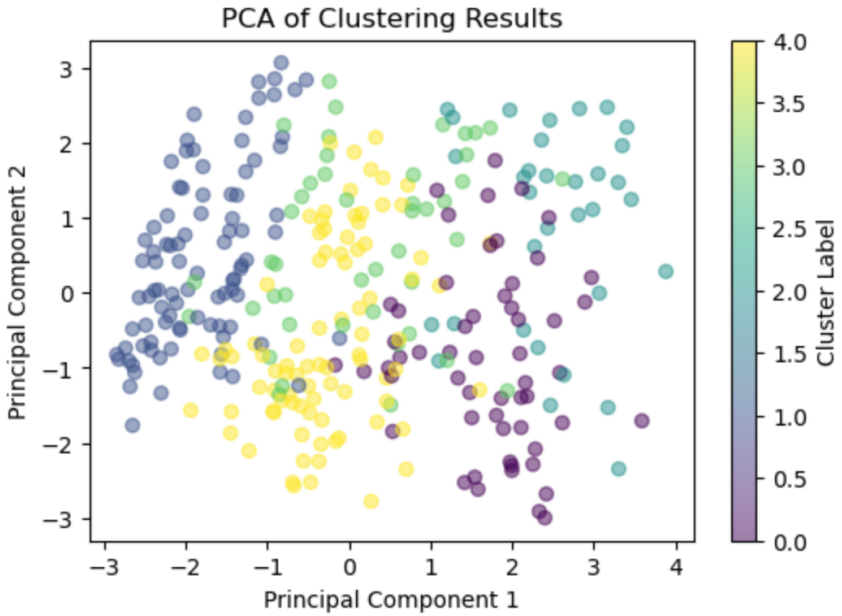
Segment 2: "Security-Seeking Samantha"
Samantha, a family-oriented individual with a stable career, prioritizes safety and security, especially when it comes to products she uses daily. She is willing to invest in a mug that promises leak-proof security and reliability. With a moderately high income and established life, she seeks quality that ensures her drinks stay contained, whether she's commuting or taking the family out for a weekend picnic.

Segment 3: "Capacious Carl"
Carl is all about capacity – a busy bee who doesn't have time to refill his mug frequently. He may be a tradesman or involved in outdoor work where he values having a large, robust mug to keep hydrated without constant interruptions. Carl may not have pursued higher education, as he's been focused on practical, hands-on work, but he knows what he needs from his tools and accessories: size and reliability.

Segment 4: "Hygienic Helen"
Helen is at the top of her career game and leads an active social life, often attending fitness classes and engaging in community activities. With a high value placed on education and health, she wants products that reflect her clean, organized lifestyle. Helen prefers mugs that are easy to clean, as she juggles work, gym, and social commitments. She's willing to pay for a premium product that won’t disrupt her orderly, health-conscious routine.

OPTIONAL:

Q1: Visualization in Classical segmentation.



	PC1	PC2
pPr10	−0.135982	0.060125
pIn1	0.042543	−0.084724
pCp12	0.151764	0.536126
pCp20	0.059140	0.073667
pCp32	−0.151557	−0.557249
pClF	−0.003442	0.184718
pCnSp	0.068099	0.250942
pBrA	0.486198	−0.019138
pBrB	−0.045122	−0.239223
pBrC	−0.446558	0.236875
IPr	−0.507277	0.041202
Iin	0.246125	−0.172614
ICp	0.336865	0.186898
ICl	−0.057928	0.152102
Icn	0.228331	−0.249222
IBr	0.028911	−0.152822

Above Image -1 Cluster Visualization Classic Segmentation

Image-2: Composition of parameter of PC1/PC2

Insights from PCA Loadings/ Composition of PC1/PC2:

The PCA loadings describe how each variable influences the principal components. For example:

- PC1 seems heavily influenced by the importance customers place on price (IPr) and preference for Brand A (pBrA), with a significant negative loading for IPr and a strong positive loading for pBrA.
- PC2 shows a strong positive loading for capacity preference at pCp12 and a strong negative loading for pCp32, indicating that this dimension might represent the trade-off between preferring smaller or larger capacities.

Recommendations for Brand C:

- Segment with Preference for Larger Capacities (pCp32):
- Product Offering: Since there is a significant cluster with a strong negative loading on PC2 for pCp32, it suggests that a segment prefers larger capacities. Brand C could introduce a larger capacity mug that is competitively priced and focuses on essential features that appeal to this segment.
- Price-Sensitive Segment (IPr):
- Product Offering: With a significant negative loading on PC1 for IPr, there's a clear segment that is highly price-sensitive. Brand C should consider offering a value product that meets basic needs without unnecessary features that add cost.
- Brand-Conscious Segments (pBrA, pBrB, pBrC):
- Product Offering: The loadings indicate distinct brand preferences. While some are strongly inclined towards Brand A (pBrA), there's also a noticeable inclination against Brand C (pBrC). Brand C needs to build its brand equity through marketing, focusing on unique selling propositions that differentiate it from Brand A and B.

Q2:

When applying the "Three Cs" for strategy development:

Company (Capabilities and Goals):
Brand C should evaluate internal capabilities, including resources, technology, and expertise, to determine which segment it can serve most effectively.
Innovation and design can be leveraged if Brand C has strengths in R&D.

Customers (Needs and Preferences):
Assess the needs and desires of each segment, focusing on the product attributes that are important to them.
Prioritize segments that are growing, underserved, or demonstrate higher profitability.

Competitors (Market Position and Offerings):
Consider the competitive landscape and how competitors are positioned in terms of pricing, brand strength, and product offerings.
Identify gaps in the market that Brand C can fill.

In determining which classical segmentation segments Brand C should pursue, the decision should align with the "Three Cs" framework: Company, Customers, and Competitors. This approach is indeed strategic and long-term, looking beyond the current market and competitive actions. The following is a detailed managerial consideration for each segment, based on the characteristics derived from the PCA and clustering analysis.

Segment 0: "Budget-Friendly Becky"

Company: Brand C must evaluate its ability to produce cost-effective products without sacrificing quality. If economies of scale or cost-efficiency can be achieved, this segment may be attractive.
Customers: This segment, skewed towards a younger, price-sensitive demographic, may be substantial in size and offer a stable long-term customer base as they mature and potentially remain loyal to the brand.
Competitors: The competition in lower-cost, basic-feature products is typically fierce. Brand C should only pursue this if it can establish a unique selling proposition (USP) or superior brand recognition.
Product Strategy: Brand C should offer a basic, reliable, and affordably priced mug that appeals to young professionals starting in their careers.

Segment 1: "Active Professional Pat"
Company: Brand C should leverage any existing research and development capabilities to innovate products that meet the durability and ease of maintenance this segment values.
Customers: This segment's combination of activity and professionalism suggests a willingness to pay a premium for added value. They likely seek out products that can seamlessly integrate into both work and workout environments.
Competitors: Competitors may not fully address the crossover between professional and active lifestyles. Brand C can capitalize on this gap.
Product Strategy: Offer a mug that balances performance with professional aesthetics, ensuring it is spill-resistant and easy to clean – a product for the gym and the office.

Segment 2: "Security-Seeking Samantha"
Company: If Brand C has the technological capability to create highly secure, leak-proof products, this segment can be highly lucrative due to its focus on product reliability.
Customers: These customers likely value trust and safety. Products serving this segment can command loyalty and a premium price.
Competitors: The focus should be on outperforming competitors in product reliability and security features.

Product Strategy: Design and market a mug that emphasizes security features such as advanced leak-proof technology and durable materials.

Segment 3: "Capacious Carl"
Company: Pursuing this segment depends on Brand C's production flexibility to create large-capacity mugs without significant cost increases.
Customers: This segment may be underserved, with customers looking for larger capacity mugs that are also easy to carry and use on the job.
Competitors: This could be a niche market where competitors have less focus, offering Brand C a clear opportunity.
Product Strategy: Offer a robust, large-capacity mug designed for extended use in outdoor or work settings, focusing on ergonomic design and thermal retention.

Segment 4: "Hygienic Helen"
Company: This segment aligns well with Brand C if there is an emphasis on high-quality production and design, leading to products that align with a health-conscious lifestyle.
Customers: Given their high value on health and education, customers in this segment may be more brand-loyal and less price-sensitive, offering opportunities for higher margins.
Competitors: A less crowded market space could exist here, with competitors focusing less on the health aspect of product design.
Product Strategy: Offer a mug with an innovative, easy-to-clean design that is also stylish, aligning with a sophisticated lifestyle.

In summary, each segment presents unique opportunities and challenges. Brand C should conduct further market research to quantify these segments' sizes and growth potential. The pursuit of segments should be aligned with Brand C's long-term strategic goals, capabilities, and the competitive landscape's evolution. The product offerings should be differentiated and tailored to each segment's preferences, driving the development of products that resonate with targeted consumers and securing a market position that is defensible over the long term.

Q3: Generative AI usage Report (ChatGPT)

Task 1: Affinity-Based Segmentation Analysis

Q1
Generative AI Use:
- Utilized a generative AI model to analyze the dataset and perform calculations required for segmentation.

- AI Prompt: "Can analyze the data give the summary gist of it”
Findings: The AI-assisted analysis revealed a segment with a preference for high-end features and specific demographics.

Q 3: a persona story that characterizes each segment.

Generative AI Use: Utilized a generative AI model to come up with characteristics story.
- AI Prompt: " **Product 1 (Brand A)**: IPr (Importance of Price): -0.208 (Consumers…… **Product 2 (Brand B):** IPr (Importance of Price): 0.127… Can you write a persona story for give importance characteristics.”
Findings: Persona story for each segment

Task 3:

Generative AI Use: Utilized a generative AI model to come up with characteristics story.
- AI Prompt: " Segment 0:Lower Importance in Attributes:….Segment 1:Higher Importance of Price and Cleanability: Segment 2:
High Importance of Containment (Icn)…Segment 3:Exceptional Importance of Capacity (ICp): This segment values larger capacities highly, which might indicate preferences for products that can hold more or serve longer usage without refilling…Segment 4…you write a persona story for give importance characteristics.”
Findings: Persona story for each segments with hypothetical character