Data Preparation

We used the highest standard deviation questions to choose the 7 variables to design differentiated clusters. Question 2 is concerned with the willingness-to-pay of customers. Question 23 gives a sense of information about a customer enjoying sports activities. Questions 11, 16 and 27 give an indication of how knowledgeable a customer is about boats and how much time they spend on boating. Question 9 and 26 gives information on how much a customer wants to show off. *[Appendix 1]*

Segmentation

We divided into 4 clusters, and we noticed some positive or negative correlations in terms of answers intra-cluster. See Highlighted correlation with colors in the appendix. *[Appendix 2]*

1) Group 1 (53.50%): Performance and Status Seeker

Mostly males for who boats represent a status symbol in terms of power, spend a lot of time on boating and have good knowledge with more than 45% of them being self-perceived as advanced or above. They often do sport and excel in it. More than 3 out of 4 are currently working.

2) Group 2 (17.10%): Social people with intermediate experience

Mostly females who have little knowledge about boats, 80% consider themselves as intermediate or below. They never or rarely boat alone. They don't excel in sport but often do some. 1 out of 6 is retired.

3) Group 3 (15.57%): Price Sensitive Pragmatist

They are the practical group where they focus on the commodity itself rather than value-added when it comes to buying a boat. Price and the functionality matter to them most, and they have the lowest proportion of high income among clusters.

4) Group 4 (13.83%): Comparably low active rate group

Mostly males who care about price but not powerful boat and status symbol and they do sport less often. 2 out of 3 think they are intermediate or below in terms of experience. The highest proportion of retired among clusters.

[More details in Appendix 3]

Target Segment

- Cluster 1 Group :

Who? Affluent people having advance & intermediate experience with boating

What? They seek for a high-performance boat, and they enjoy on-water outing and entertainment

Why? They purse a premium boat to spend vacations or free time with their family or friends for social, relaxation and entertainment purpose

- Cluster 3 Group :

Who? People who finds boating as part of their routine with middle ranged income

What? People seeking for a practical boat that can be modified and updated by individual

Why? They pursue a boat with high functionality, ranging from cruising to fishing, with relatively low price

Two models from the product line of Boston Whales

- 230 Outrage $108,947
- 190 Montauk $49,381

Position Statement

[Cluster 1] For affluent people seeking for a value-added model to spend their vacation or free time with their family or friends, 230 Outrage is the brand of a premium Whaler boat that makes them feel they're socially successful that garnered best third-party reviews in every specification compared to other boats because of its exceptional amenities, comfort, spacious layout, and lavish appearance.

[Cluster 3] For a pragmatist seeking for a functional model to spend their routine with their family or friends, 190 Montauk is the brand of the reasonable price that brings not only monetary benefit but also functional benefits because of its time-tested utilities, new enhancements, and easy operations.

R code:

```
#Data Preparation
GP_boat=read.csv("GroupProject_Boats.csv")
GP_boat$gender=ifelse(GP_boat$Q11>1,"Female","Male")
GP_SD=apply(GP_boat[2:30],2,sd)
#Cluster
GP_EuclideanD=dist(GP_boat[,c("Q1.11","Q1.9","Q1.26","Q1.27","Q1.16","Q1.23","Q1.2")])
GP_Hierarchical_Cluster=hclust(GP_EuclideanD)
plot(GP_Hierarchical_Cluster)
heatmap(as.matrix(GP_boat[,c("Q1.11","Q1.9","Q1.26","Q1.27","Q1.16","Q1.23","Q1.2")]))
GP_boat$group=as.vector(cutree(GP_Hierarchical_Cluster,k=4))
prop.table(table(GP_boat$group))
GP_Mean_by_Group<-
function(data,groups){aggregate(data,list(groups),function(x)mean(as.numeric(x)))}
GP_Group_Charater_HC=GP_Mean_by_Group(GP_boat[,c("Q1.11","Q1.9","Q1.26","Q1.27","Q1.16","Q1.2
3","Q1.2")],GP_boat$group)
#Demographic (prop.table)
prop.table(table(GP_boat$group,GP_boat$gender),margin=1)
prop.table(table(GP_boat$group,GP_boat$Q12),margin=1)
prop.table(table(GP_boat$group,GP_boat$Q13),margin=1)
prop.table(table(GP_boat$group,GP_boat$Q14),margin=1)
prop.table(table(GP_boat$group,GP_boat$Q8),margin=1)
#Demographic and useage (aggregate)
aggregate(Q10~group,data=GP_boat,mean)
aggregate(Q7.1~group,data=GP_boat,mean)
aggregate(cbind(Q9.1,Q9.2,Q9.3,Q9.4,Q9.5)~group,data=GP_boat,mean)
```

Appendix 1

#	Question	SD
11	I tend to perform minor boat repairs and maintenance on my own	1.152
9	I see my boat as a status symbol	1.076
26	Having a powerful boat is what is most important to me	1.050
27	Boating is the number one thing I do with my spare time	1.049
16	People tend to come to me for advice about boating	1.046
23	Boating allows me to excel in the sports that I am passionate about	1.024
2	When buying a boat, getting the lowest price is more important than the boat brand	1.014

Appendix 2

Question Cluster	1	2	3	4
I tend to perform minor boat repairs and maintenance on my own	3.772	1.979	3.909	3.589
I see my boat as a status symbol	3.367	2.536	2.397	2.010
Having a powerful boat is what is most important to me	3.382	2.605	2.872	1.769
Boating is the number one thing I do with my spare time	3.566	2.790	3.253	1.913
People tend to come to me for advice about boating	3.569	2.102	3.247	2.362
Boating allows me to excel in the sports that I am passionate about	3.880	2.969	3.555	3.085
When buying a boat, getting the lowest price is more important than the boat brand	2.748	2.796	3.386	2.969

*Same color show positive correlations intra-cluster. red color denote negative correlation.

Appendix 3

Group	1	2	3	4
%	53.50%	17.10%	15.57%	13.83%
Gender % Q11	Male (58.54%) Female (41.46%)	Male (34.10%) Female (65.90%)	Male (59.59%) Female (40.41%)	Male (62.72%) Female (37.28%)

Household Income % Q12	Less than 5,000 (7,84%) 35,000-99,000 (53.04%) above 100,000 (38.99%)	Less than 5,000 (11.22%) 35,000-99,000 (52.61%) above 100,000 (36.17%)	Less than 5,000 (10.5%) 35,000-99,000 (58.09%) above 100,000 (30.6%)	Less than 5,000 (11.05%) 35,000-99,000 (52.96%) above 100,000 (35.99%)
Marriage status % Q13	Married (69.50%) Never married (13.49%)	Married (69.02%) Never married (9.77%)	Married (70.09%) Never married (13.47%)	Married (73.01%) Divorced (9.25%)
Employment status % Q14	Working (77%) Not working (11,96%) Retired (10,7%)	Working (66,5%) Not working (16.66%) Retired (16,84%)	Working (72,8%) Not working (13.73%) Retired (13,47%)	Working (67,2%) Not working (14.81%) Retired (17,99%)
Boat alone Q7	Rarely ~ Sometimes	Never ~ Rarely	Rarely ~ Sometimes	Rarely ~ Sometimes
Experience % Q8	Beginner (9.03%) Intermediate (45.58%) Advanced (36.74%) Expert (8.64%)	Beginner (30.98%) Intermediate (50.93%) Advanced (16.22%) Expert (1.87%)	Beginner (11.87%) Intermediated (43.61%) Advanced (36.53%) Expert (7.99%)	Beginner (19.02%) Intermediate (48.33%) Advanced (27.76%) Expert (4.88%)
Fishing Q9.1	Sometimes ~ Often	Sometimes ~ Often	Sometimes ~ Often	Sometimes ~ Often
Swimming Q9.2	Sometimes ~ Often	Sometimes ~ Often	Sometimes ~ Often	Sometimes ~ Often
Cruising Q9.3	Sometimes ~ Often	Sometimes ~ Often	Sometimes ~ Often	Sometimes ~ Often
Water Sports Q9.4	Sometimes ~ Often	Sometimes ~ Often	Sometimes ~ Often	Rarely ~ Sometimes
Entertaining / Socializing Q9.5	Sometimes ~ Often	Sometimes ~ Often	Sometimes ~ Often	Sometimes ~ Often
Boating days Q10	48.67 days	43.03 days	46.42 days	40.70 days