MSIN0094 First Assignment Answer Sheet

Candidate Number: VVMQ9

Self-reported word count: 1496 words

1. Market Analysis

1. **(1) Conduct a situation analysis for Tom's new bubble tea shop. Discuss what each C is about in general terms, then further discuss each C in the context of bubble tea business.**

A 5C analysis conducted shines light on the key internal and external factors shaping the launch of Tom's bubble tea shop in Canary Wharf.

- **Company:** An internal look at your business's strengths, weaknesses, and overall market capabilities.

    - The joint venture's primary strength is the complementary partnership between Tom's marketing analytics expertise and Dr. Meow's product passion, creating a data-driven yet authentic brand. However, its main weakness is its startup nature, lacking brand recognition, an existing customer base, and operational experience.

- **Customers:** Identifying your target customers and understanding their needs, wants, and buying habits.

    - The target audience in Canary Wharf consists of office professionals and residents with high disposable income. These can be segmented into loyal "foodies" who value authenticity and casual "non-foodies" who are more responsive to promotions and convenience.

- **Competitors:** Analysing rival competitors to find a competitive advantage in the market.

    - The market is extremely competitive. The shop faces direct threats from established chains like YiFang and Heytea, and indirect competition from coffee shops and juice bars vying for the same beverage spending.

- **Collaborators:** Identifying key external partners like suppliers and agencies that help your business operate.

    - Key partners are essential for success. This includes the F&B consulting agency for customer data, HSBC for financing, reliable ingredient suppliers

for product consistency, and delivery platforms like Deliveroo and Uber Eats to expand market reach.

- **Context:** Analysing major external forces you can't control using tools like PESTLE or SWOT frameworks.

  - External factors present both opportunities and threats. The Canary Wharf location is economically advantageous, but discretionary spending is sensitive to economic downturns. Socially, the business can leverage bubble tea's popularity, technologically, social media offers really useful marketing channels besides SEM. Finally, legally, sticking to the strict food safety standards is another significant factor they have to take into account.

1. **(2) What would be the next steps in the marketing planning process?**

After completing the situation analysis, the next step is to develop a Strategy using Segmentation, Targeting, and Positioning (STP). Tom must use his segmentation of "foodies" and "non-foodies" to target the most promising segment(s) and then position his brand with a unique selling proposition.

Following this, Tom must define his Tactics through the 4Ps: Product, Price, Place, and Promotion. This involves designing the product menu, setting a competitive price, defining the place (both the physical store and delivery platforms), and planning promotional activities like SEM.

Finally, he needs to set clear objectives to measure success. This involves establishing key financial metrics like target profit margins, Return on Investment (ROI), and Customer Lifetime Value (CLV). By monitoring these indicators, he can make case-specific adjustments to ensure profitability.

2. **Use R code blocks to compute the customer acquisition costs for the three customer acquisition methods.**

```r
# 1. Blanket Mailing
c_menu    <- 0.50 # Cost per menu is £0.50
c_labour  <- 0.10 # Labour cost is £0.10 per menu
r_blanket <- 0.02 # Assumes a 2% response rate


# 2. Targeted Mailing
c_list     <- 0.60 # Cost per name is £0.60
c_postage  <- 0.10 # Postage cost is £0.10 per menu
r_targeted <- 0.05 # Assumes a 5% response rate


# 3. Search Engine Marketing (SEM)
c_click <- 0.50 # Cost per click is £0.50
r_sem   <- 0.25 # Assumes a 25% conversion rate from click

## complete the code below

# The total cost per offer is the sum of menu production and labour costs.
```

```r
cost_each_offer_blanket <- c_menu + c_labour

response_rate_blanket <- r_blanket

# CAC is the cost per offer divided by the probability of a response.
CAC_blanket <- cost_each_offer_blanket / response_rate_blanket

## complete the code below

# The total cost per targeted offer is the sum of the list cost, menu cost,
and postage.

cost_each_offer_targeted <- c_list + c_menu + c_postage

response_rate_targeted <- r_targeted

# CAC is the total cost per offer divided by the targeted response rate.
CAC_targeted <- cost_each_offer_targeted / response_rate_targeted

## complete the code below

# We define the cost of a click and the rate at which clicks convert to
sales.

cost_per_click <- c_click
response_rate_SEM <- r_sem

# CAC is the cost of acquiring a click divided by the probability that the
click leads to a purchase.

CAC_SEM <- cost_per_click / response_rate_SEM

# do not temper the below line of code; this is to print out your answer for
TAs to check

print(paste0("Customer Acquisition Costs for blanket mailing is £",
CAC_blanket))
```

[1] "Customer Acquisition Costs for blanket mailing is £30"

```r
print(paste0("Customer Acquisition Costs for targeted mailing is
£",CAC_targeted) )
```

[1] "Customer Acquisition Costs for targeted mailing is £24"

```r
print(paste0("Customer Acquisition Costs for SEM is £", CAC_SEM))
```

[1] "Customer Acquisition Costs for SEM is £2"

3. **Discuss the pros and cons of each of the three acquisition methods.**

Blanket Mailing

- **Pros:** Creates a tangible impression and builds local brand awareness without needing complex data (Blue Market Media, no date).

- **Cons:** It is inefficient and results in a high CAC, as its untargeted nature leads to low conversion rates and wastes resources by sending offers to many uninterested people, a practice usually described as a "waste of money" (Israilova, Suleymanov, and Vakhaeva 2023).

Targeted Mailing

- **Pros:** Delivers higher response rates and increases customer loyalty by aiming only at a specific target group with personalised interaction (Israilova, Suleymanov, and Vakhaeva 2023), while the custom element of the messaging also further boosts customer engagement (Lettrlabs 2023).

- **Cons:** Success is heavily dependent on a high-quality contact database to avoid low response rates, and it remains costly due to fixed expenses for mail item development and postage (Israilova, Suleymanov, and Vakhaeva 2023).

Search Engine Marketing (SEM)

- **Pros:** Targets users with active purchase intent and is highly measurable, allowing for real-time optimisation and precise ROI tracking (Spider AF, 2023).

- **Cons:** Requires specialised knowledge to manage effectively and also competitive keywords can be expensive, and it is less effective for building initial brand awareness.

4. **Discuss which acquisition method Tom should choose under what circumstances and explain why.**

I believe he should use all the acquisition methods, because each different method has unique advantages and disadvantages. No single method is superior, each has a distinct role, and timing to be used.

For the opening and launch of the business, the ideal strategy would be to use blanket mailing, despite its very high CAC of £30, the general goal is not long-term profitability but immediate brand awareness in Canary Wharf. Handing out menus with some sort of marketing offer would generate essential traffic and local word of mouth that many digital methods might miss. This is a short term strategy, with the goal of having a high impact launch increasing brand awareness, done over the span of one to three weeks in the beginning.

After doing so and establishing brand awareness in the area, a good next step would be to invest in targeted mailing, with caution because a bad quality list would ruin his campaign and potentially lose him alot of money. This strategy would take two to three months ideally and while the £24 CAC is still high, its goal would be to attract the foodie population. The boba tea enthusiasts are much more likely to become loyal, high-spending customers and even market the business to their friends/family/coworkers. Acquiring loyal customers would be a worthwhile investment to have a recurring customer base that will establish the shops reputation and products for their good quality justifying an arguable higher initial cost.

Now finally, for a more sustainable and safe long term strategy, it would be ideal to use SEM, for Tom's main acquisition channel. With a CAC of £2 it is by far the most financially sustainable method. It will allow him to target professionals and residents in Canary Wharf who are actively searching for bubble tea, in a very precise manner. Given the background of Tom, it will be a very good idea to use this method because he is equipped to create and manage the campaigns himself, hence cutting any external costs for consultants, and helping ensure the shops profitability.

2. A Marketing Survey to Estimate Customer Metrics

5. **Based on the case description, discuss any flaw(s) in the survey design and how would you improve the survey design**

Survey Flaws

- Sampling Bias: The survey was conducted exclusively outside a direct competitor (Heytea), meaning the sample is not representative of the broader Canary Wharf market and over-samples customers already loyal to another brand decreasing the quality of the sample substantially.

- Timing Bias: Surveying only during 'weekday lunch hours' excludes residents and workers who might purchase bubble tea in the evenings or on weekends, providing an incomplete picture of the buying intent of the general population in Canary.

- Recall Bias: Asking respondents to accurately remember their purchase frequency and spending over a six-month period is unreliable and likely leads to inaccurate estimates.

- Volunteer Bias: The individuals most likely to stop and participate in the survey are probably bubble tea enthusiasts ("foodies"), skewing the data by under representing more casual or time-pressed customers.

Proposed Improvements

- Improve Sampling Method: Conduct the survey in neutral and high-traffic locations (e.g , near the tube station) at varied times, including evenings and weekends. This

will capture a more representative sample of the Canary Wharf population hence improving the sample quality.

- Reduce Recall Bias: To get more accurate data, the questions should focus on a much shorter, more recent timeframe. For example, asking about purchases made in the "last 7 days" instead of the "past 6 months."

- Counter Volunteer Bias: Offer a small incentive, such as a coffee voucher or entry into a prize draw, to encourage a wider range of people to participate, not just the most enthusiastic customers.

6. **Load the survey_data.csv file into R. Report the summary statistics for each of the two customer segments (foodie vs non-foodie). Comment on any noteworthy observations you feel relevant for Tom.**

```
# load the data.

file_path = "C:/Users/Dath/OneDrive/Desktop/UCL SCHOOL OF MANAGEMENT BA -
Copy/Semester 1/MSIN0094 Marketing Analytics/Individual Assignment 27th
October/survey_data.csv"


survey_data <- read.csv(file_path)

# First, we create two separate data subsets from the main 'survey_data'
# dataframe. The subset() function is used to filter the data, keeping only
# the rows that match a specific condition.

# Create a subset for the foodie segment (where foodie == 1).
foodie_data <- subset(survey_data, foodie == 1)

# Create a subset for the non-foodie segment (where foodie == 0).
non_foodie_data <- subset(survey_data, foodie == 0)

# Noww, we will calculate and print the summary statistics for each group!!!!
# The summary() function provides key statistics like
# the mean, median, quartiles, min and max to the function that is called
between ()

# Print the header and summary for the foodie data.
cat("         Summary Statistics for Foodie Segment (foodie == 1)
")

          Summary Statistics for Foodie Segment (foodie == 1)

cat("\n") # This prints a blank line for spacing

cat("\n")

summary(foodie_data)
```

```
  customer_id      purchase_frequency average_spend    retention_rate
 Min.   :   1.00   Min.   : 1.000     Min.   : 0.000   Min.   :0.7100
 1st Qu.: 97.25    1st Qu.: 6.000     1st Qu.: 4.000   1st Qu.:0.8200
 Median :193.50    Median : 8.000     Median : 6.000   Median :0.8500
 Mean   :193.50    Mean   : 8.057     Mean   : 5.974   Mean   :0.8502
 3rd Qu.:289.75    3rd Qu.:10.000     3rd Qu.: 8.000   3rd Qu.:0.8800
 Max.   :386.00    Max.   :19.000     Max.   :14.000   Max.   :0.9800
     foodie
 Min.   :1
 1st Qu.:1
 Median :1
 Mean   :1
 3rd Qu.:1
 Max.   :1

# Making it visually aesthetic by using blank lines for spacing
# Using cat function because it doenst show ""
# and other not visually aesthetic characters
cat("\n")

cat("\n")

# Print the header and summary for the non-foodie data.
cat("        Summary Statistics for Non-Foodie Segment (foodie == 0)
")

        Summary Statistics for Non-Foodie Segment (foodie == 0)

cat("\n")

cat("\n")

summary(non_foodie_data)

  customer_id      purchase_frequency average_spend    retention_rate
 Min.   : 387.0    Min.   : 0.000     Min.   : 0.000   Min.   :0.5500
 1st Qu.: 540.2    1st Qu.: 3.000     1st Qu.: 2.000   1st Qu.:0.6700
 Median : 693.5    Median : 4.000     Median : 4.000   Median :0.7000
 Mean   : 693.5    Mean   : 4.021     Mean   : 3.993   Mean   :0.7032
 3rd Qu.: 846.8    3rd Qu.: 5.000     3rd Qu.: 5.000   3rd Qu.:0.7400
 Max.   :1000.0    Max.   :11.000     Max.   :12.000   Max.   :0.8600
     foodie
 Min.   :0
 1st Qu.:0
 Median :0
 Mean   :0
 3rd Qu.:0
 Max.   :0

# Noteworthy Observations for Tom, done using one cat function so it renders
nicely
cat("\n\nNoteworthy Observations for Tom\n\n",
```

```
    "The data shows that the Foodies are a high value segment, clearly
showing that ",
    "they are much more valuable than the non foodie segment across every key
metric. ",
    "On average, foodies purchase twice as frequently (Mean of 8.06 vs.
4.02), ",
    "spend 50% more per visit (Mean of £5.97 vs. £3.99), and are far more
loyal with ",
    "a much higher retention rate (Mean of 85% vs. 70%).\n\n",
    "The statistics confirm that Tom should prioritise Foodies, since they
are loyal, ",
    "high frequency customers, and non-foodies are more casual and less
predictable, ",
    "also spending less. While foodies are the minority of the customer base,
making ",
    "up 386 of the 1000 participants or 38.6%, their superior purchasing
metrics ",
    "suggest that they should be the focus of Tom's marketing and retention
efforts, ",
    "to ensure profitability.\n")
```

Noteworthy Observations for Tom

 The data shows that the Foodies are a high value segment, clearly showing
that they are much more valuable than the non foodie segment across every
key metric. On average, foodies purchase twice as frequently (Mean of 8.06
vs. 4.02), spend 50% more per visit (Mean of £5.97 vs. £3.99), and are far
more loyal with a much higher retention rate (Mean of 85% vs. 70%).

 The statistics confirm that Tom should prioritise Foodies, since they are
loyal, high frequency customers, and non-foodies are more casual and less
predictable, also spending less. While foodies are the minority of the
customer base, making up 386 of the 1000 participants or 38.6%, their
superior purchasing metrics suggest that they should be the focus of Tom's
marketing and retention efforts, to ensure profitability.

7. **Compute the average spending, average shopping frequency, and average
   retention rate for both foodie and non-foodie customer segments.**

```
# Compute and report the required statistics
# First, let's load the dplyr library, which is a good tool for data
manipulation.
library(dplyr)
```

```
Attaching package: 'dplyr'
```

```
The following objects are masked from 'package:stats':

    filter, lag

The following objects are masked from 'package:base':

    intersect, setdiff, setequal, union

# The goal here is to calculate the average spending, frequency, and
retention for
# our two customer groups: 'foodies' and 'non-foodies'.
# We can do this all in one go!
segment_key_metrics <- survey_data %>% # We'll start with our main dataset,
survey_data.
# Next, we'll group everything by the 'foodie' column. This splits our data
into two buckets
# (where foodie is 1 for 'foodie' and 0 for 'non-foodie').
group_by(foodie) %>%
# Now the summarise() function will calculate the mean for each group.
summarise(
    # Let's find the average spending for each group.
  avg_spending = mean(average_spend),
    # And now the average purchase frequency.
  avg_frequency = mean(purchase_frequency),
    # Finally, the average retention rate.
  avg_retention = mean(retention_rate)
  )
#Pulling out the numbers for our non-foodie customers
# Now that we have our summary table (segment_metrics), let's take the
specific values for the
# non-foodie group (where foodie == 0) and save them into their own
variables.
# Get the average spending for non-foodies.
avg_spending_nonfoodie <- segment_key_metrics %>% filter(foodie == 0) %>%
pull(avg_spending)
# Get the average purchase frequency for non-foodies.
avg_frequency_nonfoodie <- segment_key_metrics %>% filter(foodie == 0) %>%
pull(avg_frequency)
# And get the average retention rate for non-foodies.
avg_retention_rate_nonfoodie <- segment_key_metrics %>% filter(foodie == 0)
%>% pull(avg_retention)

# Extract the average spending for the foodie segment (foodie == 1).
avg_spending_foodie <- segment_key_metrics %>% filter(foodie == 1) %>%
pull(avg_spending)
# Extract the average frequency for the foodie segment.
avg_frequency_foodie <- segment_key_metrics %>% filter(foodie == 1) %>%
pull(avg_frequency)
# Extract the average retention rate for the foodie segment.
```

```r
avg_retention_rate_foodie <- segment_key_metrics %>% filter(foodie == 1) %>%
pull(avg_retention)

# This code block is for printing the results, pls do not modify
print("Metrics for foodie segment:")

[1] "Metrics for foodie segment:"

print(paste("The average spending is £", avg_spending_foodie))

[1] "The average spending is £ 5.9740932642487"

print(paste("The average frequency is", avg_frequency_foodie))

[1] "The average frequency is 8.05699481865285"

print(paste("The average retention rate is", avg_retention_rate_foodie))

[1] "The average retention rate is 0.850233160621762"

print("Metrics for non-foodie segment:")

[1] "Metrics for non-foodie segment:"

print(paste("The average spending is £", avg_spending_nonfoodie))

[1] "The average spending is £ 3.99348534201954"

print(paste("The average frequency is", avg_frequency_nonfoodie))

[1] "The average frequency is 4.02117263843648"

print(paste("The average retention rate is", avg_retention_rate_nonfoodie))

[1] "The average retention rate is 0.703241042345277"
```

3. Customer Break-Even and Lifetime Value

8. **Use R programming to compute the CLV for foodie customers. Discuss whether or not foodie customers are profitable to acquire.**

```r
# First, define all the core variables for our calculation, based on the case
# study so its easy to change later
# I will go very in depth in this calculation, so I dont have to do the same
on
# the CLV Calculations for Non Foodies


N <- 24    # This represents a 2-year time period, so 24 months.
COGS <- 0.45  # The cost of ingredients for each bubble tea is 45% of the
price.
k_annual <- 0.10 # The annual discount rate, representing the time value of
money.
k <- k_annual / 12 # Since we're working with months, we need the monthly
```

```r
discount rate.
c <- 0  # For this we'll assume there are no extra marketing costs per month.
# Steps for calculating CLV
# Step 1: Figure out how much profit a foodie brings in each month.
# 'M' is for monthly the profit margin which is the average spend,
# times how often they visit, minus the cost of the tea itself.
M_foodie <- (avg_spending_foodie* avg_frequency_foodie)* (1 - COGS)

# Step 2: Calculate the net profit per month, which is the 'g'.
# In this case, since we have no extra marketing costs (c=0), g is the same
as M.
g_foodie <- M_foodie - c

#Step 3: Create a sequence of these monthly profits for the next 24 months.
# The rep() function is a useful way to just repeat our 'g_foodie' value 24
times.
g_seq_foodie <- rep(g_foodie, N)

#Step 4: Account for customer loyalty (or the chance they won't come back).
# Not every customer will stay for 24 months, so we apply the retention rate.
# This decreases each month's expected profit over time.
r_foodie <- avg_retention_rate_foodie # Let's take the foodie retention rate
we calculated earlier.
g_seq_after_retention_foodie <- g_seq_foodie * (r_foodie ^ (0:(N-1)))

#Step 5: Create our discount factor.
# A pound earned next year isn't worth as much as a pound today. This
calculates the
# "present value" factor for each of the next 24 months.
discount_factor <- 1 / ((1 + k) ^ (1:N))

#Step 6: Apply the discount factor to our profits with retention factored in.
# This tells us what each of those future monthly profits is actually worth
in today's money.
g_seq_after_retention_discount_foodie <- g_seq_after_retention_foodie *
discount_factor

# Step 7: Finally, calculate the Customer Lifetime Value!!!!!!!
# We just sum up all those discounted future profits and then subtract the
cost
# it took to acquire this customer in the first place.
# Using the SEM assuming we want the most profitable method.
CLV_foodie <- sum(g_seq_after_retention_discount_foodie) - CAC_SEM

# Step 8: Discussion on profitability, (sidenote : doing this hurt my mind)
cat("\n\nDiscussion on Profitability of Foodie Customers\n\n",
    "Yes, foodie customers are highly profitable to acquire.\n",
    paste0("Their high lifetime value of £", round(CLV_foodie, 2), " means
that Tom will make a substantial\n"),
```

```r
    "profit regardless of which acquisition method he uses.\n\n",
    paste0("- Acquiring them through SEM (costs £", CAC_SEM, ") is
exceptionally profitable.\n"),
    paste0("- Using targeted mailing (costs £", CAC_targeted, ") is also
highly profitable.\n"),
    paste0("- Even using the most expensive method, blanket mailing (costs
£", CAC_blanket, "), generates a significant profit.\n\n"),
    "Therefore, Tom can confidently invest in any of these channels to
attract foodie customers,\n",
    "as their high CLV ensures strong profitability and justifies even the
higher acquisition costs.\n")
```

Discussion on Profitability of Foodie Customers

 Yes, foodie customers are highly profitable to acquire.
 Their high lifetime value of £162.65 means that Tom will make a substantial
 profit regardless of which acquisition method he uses.

 - Acquiring them through SEM (costs £2) is exceptionally profitable.
 - Using targeted mailing (costs £24) is also highly profitable.
 - Even using the most expensive method, blanket mailing (costs £30),
generates a significant profit.

 Therefore, Tom can confidently invest in any of these channels to attract
foodie customers,
 as their high CLV ensures strong profitability and justifies even the higher
acquisition costs.

```r
# This code block is for printing the results, pls do not modify
print(paste0("The g_seq is ", g_seq_foodie[1:5]))
```

```
[1] "The g_seq is 26.4732811619104" "The g_seq is 26.4732811619104"
[3] "The g_seq is 26.4732811619104" "The g_seq is 26.4732811619104"
[5] "The g_seq is 26.4732811619104"
```

```r
print(paste0("The g_seq_after_retention_discount is ",
g_seq_after_retention_discount_foodie[1:5]))
```

```
[1] "The g_seq_after_retention_discount is 26.2544937142913"
[2] "The g_seq_after_retention_discount is 22.1379581863399"
[3] "The g_seq_after_retention_discount is 18.666868917505"
[4] "The g_seq_after_retention_discount is 15.7400240912156"
[5] "The g_seq_after_retention_discount is 13.2720896839705"
```

```r
print(paste0("The CLV for foodie customers is £", CLV_foodie))
```

```
[1] "The CLV for foodie customers is £162.651845501621"
```

9. **Use R programming to compute the CLV for non-foodie customers; use comments #... to explain your steps. Discuss whether non-foodie customers are profitable to acquire.**

```r
# The constants N, COGS, k, c, and the discount_factor vector have already
# been defined in the previous question, so we can reuse them here.

# Step 1: Calculate M, the monthly profit margin for a non-foodie customer.
M_nonfoodie <- (avg_spending_nonfoodie * avg_frequency_nonfoodie) * (1 -
COGS)

# Step 2: Calculate g, the net profit for a non-foodie customer.
g_nonfoodie <- M_nonfoodie - c

# Step 3: Create a sequence of these monthly profits for the next 24 months.
g_seq_nonfoodie <- rep(g_nonfoodie, N)

# Step 4: Apply the retention rate to the profit sequence.
r_nonfoodie <- avg_retention_rate_nonfoodie # r: retention rate for non-
foodies.
g_seq_after_retention_nonfoodie <- g_seq_nonfoodie * (r_nonfoodie ^ (0:(N -
1)))

# Step 5: Apply the discount factor to the profit with retention factored in.
g_seq_after_retention_discount_nonfoodie <- g_seq_after_retention_nonfoodie *
discount_factor

# Step 6: Calculate the final CLV for a non-foodie customer.
# Also using SEM as CAC because it is the most profitable method for
acquisition.
CLV_nonfoodie <- sum(g_seq_after_retention_discount_nonfoodie) - CAC_SEM

# Step 7: Print the discussion on profitability.
cat("\n\nDiscussion on Profitability of Non-Foodie Customers\n\n",
    "Whether it's profitable to acquire non-foodie customers depends entirely
on the method used.\n",
    paste0("Given their lifetime value of £", round(CLV_nonfoodie, 2),
":\n\n"),
    paste0("- Acquiring them through SEM (costs £", CAC_SEM, ") is very
profitable.\n"),
    paste0("- Using targeted mailing (costs £", CAC_targeted, ") is barely
profitable, leaving a tiny profit of only £", round(CLV_nonfoodie -
CAC_targeted, 2), ".\n"),
    paste0("- Using blanket mailing (costs £", CAC_blanket, ") is
unprofitable and results in a loss.\n\n"),
    "Therefore, to ensure he makes money, Tom should only use low-cost
channels like SEM\n",
    "to attract non-foodie customers.\n")
```

```
Discussion on Profitability of Non-Foodie Customers

 Whether it's profitable to acquire non-foodie customers depends entirely on
the method used.
 Given their lifetime value of £26.94:

 - Acquiring them through SEM (costs £2) is very profitable.
 - Using targeted mailing (costs £24) is barely profitable, leaving a tiny
profit of only £2.94.
 - Using blanket mailing (costs £30) is unprofitable and results in a loss.

 Therefore, to ensure he makes money, Tom should only use low-cost channels
like SEM
 to attract non-foodie customers.
```

```r
# This code block is for printing the results, pls do not modify
print(paste0("The g_seq is ", g_seq_nonfoodie[1:5]))
```

```
[1] "The g_seq is 8.83217169412938" "The g_seq is 8.83217169412938"
[3] "The g_seq is 8.83217169412938" "The g_seq is 8.83217169412938"
[5] "The g_seq is 8.83217169412938"
```

```r
print(paste0("The g_seq_after_retention_discount is ",
g_seq_after_retention_discount_nonfoodie[1:5]))
```

```
[1] "The g_seq_after_retention_discount is 8.75917853963245"
[2] "The g_seq_after_retention_discount is 6.10890629385074"
[3] "The g_seq_after_retention_discount is 4.2605292195146"
[4] "The g_seq_after_retention_discount is 2.97141719927996"
[5] "The g_seq_after_retention_discount is 2.07235292079106"
```

```r
print(paste0("The CLV for non-foodie customers is £", CLV_nonfoodie))
```

```
[1] "The CLV for non-foodie customers is £26.944102785776"
```

4. A Loyalty Program for Tom's Bubble Tea Shop

10. **Should Tom go ahead with the loyalty program for the bubble tea business? Explain your codes and calculations in detail.**

Yes, I think Tom should definitely launch the loyalty program, because the analysis projects a total profit increase of **£11,437.17**, making it a clear financial success. The program's profitability is driven entirely by the high-value "foodie" segment, whose gains significantly outweigh the minor losses from the "non-foodie" group.

- **Foodie Segment:** Each foodie customer generates an additional **£32.46** in lifetime value.

- - **Non-Foodie Segment:** This large gain easily offsets the small loss of **£1.78** per non-foodie customer.

  Because the significant profit from the more valuable customer group is so much larger than the small loss from the less valuable group, the loyalty program is a great financial decision.

```
# Setup: Define new variables required for the loyalty program analysis
# These values are based on the case brief for this specific question.
retail_price_free_drink <- 4      # The retail price of the free drink is £4.
r_foodie_loyalty         <- 0.90   # New retention rate for foodies with the
program.
r_nonfoodie_loyalty      <- 0.75   # New retention rate for non-foodies.
num_foodies              <- 386    # Total foodie customers from survey.
num_non_foodies          <- 614    # Total non-foodie customers from survey.


# Step 1: Calculate the actual cost of the "free" drink to the business.
actual_cost_of_free_drink <- retail_price_free_drink * COGS

# Step 2: Calculate the monthly cost of the loyalty program for each customer
type.
loyalty_cost_foodie     <- actual_cost_of_free_drink * (avg_frequency_foodie /
4)
loyalty_cost_nonfoodie <- actual_cost_of_free_drink *
(avg_frequency_nonfoodie / 4)

# Step 3: Find the new, adjusted monthly profit for each segment.
g_foodie_loyalty     <- M_foodie - loyalty_cost_foodie
g_nonfoodie_loyalty <- M_nonfoodie - loyalty_cost_nonfoodie

# Step 4: Recalculate the CLV for both segments with the new numbers.
g_seq_foodie_loyalty     <- rep(g_foodie_loyalty, N) * (r_foodie_loyalty ^
(0:(N - 1)))
discounted_g_seq_foodie   <- g_seq_foodie_loyalty * discount_factor
CLV_foodie_loyalty        <- sum(discounted_g_seq_foodie) - CAC_SEM

g_seq_nonfoodie_loyalty   <- rep(g_nonfoodie_loyalty, N) *
(r_nonfoodie_loyalty ^ (0:(N - 1)))
discounted_g_seq_nonfoodie  <- g_seq_nonfoodie_loyalty * discount_factor
CLV_nonfoodie_loyalty     <- sum(discounted_g_seq_nonfoodie) - CAC_SEM

# Step 5: Calculate the value the program adds (or removes) per customer.
change_CLV_foodie     <- CLV_foodie_loyalty - CLV_foodie
change_CLV_nonfoodie <- CLV_nonfoodie_loyalty - CLV_nonfoodie

# Step 6: Calculate the total projected profit change for the entire customer
base.
```

```r
total_change         <- (change_CLV_foodie * num_foodies) +
(change_CLV_nonfoodie * num_non_foodies)

# Step 7: Put the key findings into a simple summary table.
results_summary <- data.frame(
  Segment             = c("Foodie", "Non-Foodie"),
  Original_CLV        = c(CLV_foodie, CLV_nonfoodie),
  Loyalty_Program_CLV = c(CLV_foodie_loyalty, CLV_nonfoodie_loyalty),
  Change_in_CLV       = c(change_CLV_foodie, change_CLV_nonfoodie)
)

# Step 8: Print the final results.
print(results_summary, row.names = FALSE)

    Segment Original_CLV Loyalty_Program_CLV Change_in_CLV
     Foodie     162.6518            195.11644     32.464590
 Non-Foodie      26.9441             25.16208     -1.782025

cat("-----------------------------------------------------")

-----------------------------------------------------

cat(sprintf("\nTotal Projected Profit Increase from Program: £%.2f\n",
total_change))


Total Projected Profit Increase from Program: £11437.17

cat("-----------------------------------------------------")

-----------------------------------------------------
```

11. **Discuss how Tom can use CLV as a customer relationship management tool to guide his future marketing decisions**

Customer Lifetime Value (CLV) is a forward-looking metric that shifts strategy from a product to a customer focus, guiding decisions across the customer lifecycle: **Acquisition**, **Development**, and **Retention**.

For **acquisition**, CLV sets the maximum profitable spending limit (CAC). The large gap between the Foodie CLV (£162.65) and Non-foodie CLV (£26.94) dictates which marketing channels are financially viable. High-cost mailings are only profitable for foodies, while low-cost SEM is profitable for both. This justifies a targeted investment, allowing Tom to confidently invest more to acquire high-value "foodies."

For **development**, CLV helps tailor marketing efforts, meaning the strategy for high-CLV "Foodies" is to increase their spend per visit through cross selling and upselling, like for example offering premium toppings or selling different items complementary to bubble tea. For low-CLV "Non-foodies," the goal is to increase their purchase frequency using targeted promotions and email/social media reminders.

For **retention**, CLV dictates how much to spend to keep a customer. The high value of a "foodie" (£162.65) justifies significant spending on personalised discounts to prevent churn. This approach ensures retention efforts are focused on the most valuable customers.

However, these strategies are only effective if the underlying survey data is accurate, as the predictive power of CLV depends entirely on the quality of its inputs.

12. **What name would you give to the bubble tea shop ;-)**

The Daily Meow

Logo would be DM (d shaped like a glass, and a meow would have whiskers)

References

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