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Syracuse University
Whitman School of Management
Marketing 255: Marketing Principles (Fall 2012)

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Course Description

We find examples of marketing activities all around us. This course attempts to present basic marketing concepts and provide a framework to understand how these concepts are implemented in practice. The class will use a lecture-discussion format, and student participation is strongly encouraged. Due to limited class time, class discussions will focus on selected topics. You are required to study the rest of the assigned material on your own. Each week, I will post the material covered on Blackboard. Please check the Blackboard regularly.

The course has the following learning objectives:

- Understand the meaning of marketing, the areas of marketing decision making, and factors that affect outcomes of marketing actions.

- Establish a framework to understand buyer behavior.

- Understand the basic ideas behind market segmentation.

- Understand the basics of marketing research.

- Understand the four areas of marketing decision making: product, price, promotion, and distribution.

Required Material

1. Course Reader: This is available from the Copy Centers at the Marshall Square Mall (Reader Number 20123-1012) and is also posted as a pdf document on Blackboard. Since the document is available online, the Copy Centers will only provide the Reader upon request.

2. Russell I. Haley, "Benefit Segmentation: A Decision Oriented Research Tool."

3. Slides for class sessions: These will be posted periodically as course documents on Blackboard.

4. Capstone: This is used for all three courses in the Integrated Core. Details will be provided.

Evaluation Procedure

1. Two examinations at 25% each = 50%

2. Two quizzes at 7.5% each = 15%

3. Four homework assignments at 3.75% each = 15%

4. Class participation = 5%

5. Capstone simulation = 15%

Examinations: The tests are closed-book-and-notes and include multiple-choice, true false, and short-essay questions. Sample questions and review sheets will be distributed before each test.

Examination 1 will be held in class on the following date:

- Monday and Wednesday sections (M001 and M002): Monday, October 15, 2012.

- Tuesday and Thursday section (M003): Thursday, October 11, 2012.

Examination 2 will only include material covered after Examination 1. This will be held in the Lender Auditorium on Wednesday, December 5, 2012, from 10:45 am to 12:30 pm.

Quizzes: The quizzes are closed book and notes, and each quiz will last 30 minutes. The quizzes may include multiple-choice and short essay questions.

Home-work assignments: Please note the following important points regarding home-work assignments:

- The assignments are included in the syllabus. The assignments with answer templates are also posted as Word files in the Assignment link in Blackboard and in a separate folder called Assignments on Blackboard.

- You are free to complete the assignments yourself or work with others. If you work with others, please make a single submission, and make sure you include the names of all the participants in the document.

- To complete an assignment, please download the answer template (Word file), fill in the answers, and submit it using the Assignment link in Blackboard. Please name the answer file as follows: your last name, your first name, assignment number. You are required to keep a copy of the answer file for reference.

- The day after the homework is due, I will email you if I do not find your homework. Please make sure your Blackboard email address is correct. You will get a day to turn in the homework.

Class Participation: 5% of the course grade is based on class participation. To get full points, you need to do the following.

- Attend class sessions.

- Behave professionally in class:

  - Please put your cell phones in silent mode.
  - Please do not send or receive text messages during the class session.
  - Please keep conversation with each other at a minimum.
  - Please be courteous to everybody else in the class.

- Complete class participation surveys within the specified times. During the course of the semester, I will email you links for four online surveys. The data collected will be used for teaching this course.

Capstone Assignment: Students will be organized into teams and will compete with other teams in a simulated business market. The assignment spans all three courses (marketing, finance, and supply chain management), and the game performance and final report count for 15% of your grade in each course. Consult the Capstone Game manual and handouts for details of the simulation game.

Integrated Core: This course is a part of the integrated business core, including FIN 256 (Corporate Finance), and SCM 265 (Supply Chain Management). The objective of this integration is to show that decisions made in any functional area impact the decisions and implementation of those decisions in other areas. A common complaint of many employers is that students do not understand the interdependencies and complexities of business decision-makings and the domino effect of their decisions. By the time you complete the integrated core, we hope that you will be able to:

- understand the interdependencies of these three areas.

- effectively utilize data/information from the three areas in making business decisions.

- perform multi-perspective analyses of business problems.

- utilize multiple criteria in evaluating business decisions.

Policy on Student Academic Work: I intend to use work that you complete this semester for educational purposes in this course during this semester. Your registration and continued enrollment constitute your permission. I also intend to use academic work that you complete this semester in subsequent semesters for educational purposes. Before using your work for that purpose, I will either get your written permission or render the work anonymous by removing all your personal identification.

Academic Integrity Policy Certification Requirement

Syracuse University sets high standards for academic integrity. Those standards are supported and enforced by students, including those who serve as academic integrity hearing panel members and hearing officers. The presumptive sanction for a first offense is course failure, accompanied by the transcript notation Violation of the Academic Integrity Policy. The standard sanction for a first offense by graduate students is suspension or expulsion. Students should review the Office of Academic Integrity online resource "Twenty Questions and Answers About the Syracuse University Academic Integrity Policy and confer with instructors about course-specific citation methods, permitted collaboration (if any), and rules for examinations. The Policy also governs the veracity of signatures on attendance sheets and other verification of participation in class activities. Additional guidance for students can be found in the Office of Academic Integrity resource: What does academic integrity mean?

In this class, you are allowed to collaborate with other students when you complete the four homework assignments. However, the two quizzes and the two exams must be completed individually. Also, in the tests and quizzes, I will specify when you can discuss the contents with others. If you are unsure about how the academic integrity policy applies to specific elements of this course, please ask me for clarifications.

Students with Special Needs

If you believe that you need accommodations for a disability, please contact the Office of Disability Services(ODS), http://disabilityservices.syr.edu, located in Room 309 of 804 University Avenue, or call (315) 443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented "Disabilities Accommodation Authorization Letters," as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

Religious Observances Policy

Syracuse University's religious observances policy, found at http://supolicies.syr.edu/emp_ben/religious_observance.htm, recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes. For fall and spring semesters, an online notification process is available through MySlice/Student Services/Enrollment/My Religious Observances from the first day of class until the end of the second week of class.

Tentative Schedule
Sections M001 and M002 (Monday & Wednesday Sections)

Session	Plan of coverage	Source
1. 8/27 Mon	Introduction; Marketing Mix; Marketing Environment	Reader: 1
2. 8/29 Wed	Marketing Environment	Reader: 1
3. 9/5 Wed	Consumer Decision Making	Reader: 2
4. 9/10 Mon	Consumer Decision Making	Reader: 2
5. 9/12 Wed	Consumer Decision Making **(Assignment 1 is due Friday, 9/14/2012)**	Reader: 2
6. 9/17 Mon	Business Marketing; Market Segmentation	Reader: 2,3
7. 9/19 Wed	Market Segmentation	Reader: 3, Haley article
8. 9/24 Mon	Market Segmentation	3
9. 9/26 Wed	Review; Quiz 1	
10. 10/1 Mon	Marketing Research	Reader: 4
11. 10/3 Wed	Marketing Research **(Assignment 2 is due Friday, 10/5/2012)**	Reader: 4
12. 10/8 Mon	Product Strategy	Reader: 6
13. 10/10 Wed	Product Strategy; Review	Reader: 6
14. 10/15 Mon	**Exam 1**	
15. 10/17 Wed	Product Strategy	Reader: 6
16. 10/22 Mon	Pricing Strategy	Reader: 7
17. 10/24 Wed	Pricing Strategy	Reader: 7
18. 10/29 Mon	Pricing Strategy	Reader: 7
19. 10/31 Wed	Pricing Strategy; Promotion Strategy **(Assignment 3 due Friday, 11/2/2012)**	Reader: 7,9
20. 11/5 Mon	Promotion Strategy	Reader: 9
21. 11/7 Wed	Distribution Strategy **(Assignment is 4 due Friday, 11/9/2012)**	Reader: 7
22. 11/12 Mon	Distribution Strategy; Review; Quiz 2	8
23. 11/14 Wed	Distribution Strategy; Review	Reader: 8
24. 12/5	**Exam 2, Lender Auditorium, 10:45 am to 12:30 pm**	

Tentative Schedule
Section M003 (Tuesday & Thursday Section)

Session	Plan of coverage	Source
1. 8/28 Tuesday	Introduction; Marketing Mix; Marketing Environment	Reader: 1
2. 8/30 Thursday	Marketing Environment	Reader: 1
3. 9/4 Tuesday	Consumer Decision Making	Reader: 2
4. 9/6 Thursday	Consumer Decision Making	Reader: 2
5. 9/11 Tuesday	Consumer Decision Making	Reader: 2
6. 9/13 Thursday	Business Marketing; Market Segmentation **(Assignment 1 is due Friday, 9/14/2012)**	Reader: 2,3
7. 9/18 Tuesday	Market Segmentation	Reader: 3, Haley article
8. 9/20 Thursday	Market Segmentation	3
9. 9/25 Tuesday	Review; Quiz 1	
10. 9/27 Tuesday	Marketing Research	Reader: 4
11. 10/2 Tuesday	Marketing Research	Reader: 4
12. 10/4 Thursday	Product Strategy **(Assignment 2 is due Friday, 10/5/2012)**	Reader: 6
13. 10/9 Tuesday	Product Strategy; Review	Reader: 6
14. 10/11 Thursday	**Exam 1**	
15. 10/16 Tuesday	Product Strategy	Reader: 6
16. 10/18 Thursday	Pricing Strategy	Reader: 7
17. 10/23 Tuesday	Pricing Strategy	Reader: 7
18. 10/25 Thursday	Pricing Strategy	Reader: 7
19. 10/30 Tuesday	Pricing Strategy; Promotion Strategy	Reader: 7,9
20. 11/1 Thursday	Promotion Strategy **(Assignment 3 due Friday, 11/2/2012)**	Reader: 9
21. 11/6 Tuesday	Distribution Strategy	Reader: 7
22. 11/8 Thursday	Distribution Strategy; Review; Quiz 2 **(Assignment is 4 due Friday, 11/9/2012)**	8
23. 11/13 Tuesday	Distribution Strategy	Reader: 8
24. 11/15 Thursday	Review	
25. 12/5	**Exam 2, Lender Auditorium,** **10:45 am to 12:30 pm**	

Marketing 255, Fall 2012: Assignments

Instructions:

- All assignments are compulsory.

- The assignments are due on the dates specified.

- Please prepare your answer as a a Word file by filling in the answer template for the assignment posted on Blackboard, and submit through the Blackboard.

- After you submit, please retain an electronic copy for yourself.

- You can work with others on a homework assignment. If you do so, please submit the assignment jointly and include the names of all the participants in the document.

1(5+5+5 = 15 pt) John, a high school senior in Binghamton, NY, has received offers of admission from five colleges: SUNY Binghamton (SUNY), Colgate, Cornell, University of Rochester (Rochester), and Rensselaer Polytechnic Institute (RPI). John's evaluative criteria are academic reputation, expense, distance from home, class size, and quality of life, and he rates each college on these five attributes on 1-7 scales (1: poor, 7: excellent). His ratings are as follows:

College	Academic Reputation (X_1)	Expense (X_2)	Distance (X_3)	Class Size (X_4)	Quality of Life (X_5)
1. SUNY	5	7	7	4	5
2. Colgate	5	4	4	7	7
3. Cornell	7	3	4	5	7
4. Rochester	7	3	3	5	3
5. RPI	5	3	3	4	5

1(a), 1(b), and 1(c) are independent questions based on the information given above.

1.(a) Suppose for each college, John computes a score by adding the ratings on the five attributes. The college with the highest score is chosen. Which rule or combination of rules is John using? (If a combination of rules is used, specify the sequence in which they are applied.) Which college will he choose? (Show all numbers used to compare alternatives.)

1.(b) Suppose John first makes a short list that only includes colleges that rate 5 or more on quality of life, and 5 or more on class size. (A college is not included in the short list otherwise.) Then, for each college in the short list, John adds the ratings on all five attributes to compute a score, and chooses the college with the highest score. Which rule or combination of rules is John using to select a college? (If a combination of rules is used, specify the sequence in which they are applied.) Which college will John choose? (Show all numbers used to compare alternatives.)

1.(c) Suppose John uses a lexicographic rule where (1) academic reputation is most important, (2) class size is second most important, (3) quality of life is third most important, (4) expense is fourth most important, and (5) distance is least important. Which college will John choose? Outline the stages in the decision process and clearly identify which colleges are considered at each stage.

2.(1 + 1 + 1 + 1 = 4 pt) Suppose you have a sample of 2000 students from Syracuse University. Each student bought one tube of toothpaste in January 2012 and one tube of toothpaste in February 2012. They bought brand A, B, C, D, or E. The brand switching matrix is provided below:

| | February 2012 | | | | |
January 2012	A	B	C	D	E
A	400	0	150	0	0
B	0	200	0	100	100
C	150	0	400	0	0
D	0	100	0	200	100
E	0	0	0	0	100

2.(a) How many students purchased B in January 2012?

2.(b) How many students purchased B in February 2012?

2.(c) How many students who bought B in January 2012 switched to other brands in February 2012? (These are people who bought B in January, but bought some other brand in February.)

2.(d) Based on the brand-switching matrix, which brand or brands, if any, is **not** a competitor of brand B?

3.$(4+4+3 = 11$ pt) Suppose you have a sample of 40 Syracuse area households. Each household visited exactly one grocery store on 8/11/2012, and exactly one grocery store on 8/18/2012. They only visited one of four stores: A (Aldi), B (Price Chopper), C (Tops), or D (Wegmans). The stores visited are provided on the next page.

3.(a) Compute the market share of each store on 8/11/2012 and on 8/18/2012 for this sample of 40 households. (Compute the market share of a store on a given date as the fraction of the sample that visited the store on that date, multiplied by 100%. For example, if 8 households out of 40 visited Store X on 8/11/2012, then market share is $\frac{8}{40} \times 100\% = 20\%$.)

3.(b) Prepare a brand-switching matrix, that is, a cross-tabulation of store visited on 8/11/2012 against store visited on 8/18/2012.

3.(c) Based on the brand-switching matrix, what can you say qualitatively about the nature of competition among these stores? (For each store, examine if it is gaining customers from or losing customers to any other store. If it is gaining or losing, is the gain/loss one-way or two-way?)

Household	Store 8/11/2012	Store 8/18/2012	Household	Store 8/11/2012	Store 8/18/2012
1	C	C	21	C	D
2	C	C	22	C	D
3	A	A	23	A	A
4	C	C	24	A	A
5	A	A	25	B	B
6	C	C	26	D	D
7	C	C	27	D	C
8	B	A	28	D	C
9	D	D	29	B	A
10	D	C	30	B	A
11	C	C	31	D	D
12	B	A	32	C	D
13	D	D	33	C	C
14	D	D	34	C	D
15	A	A	35	B	B
16	B	B	36	D	C
17	D	D	37	B	B
18	B	B	38	B	B
19	A	A	39	D	D
20	C	C	40	D	D

Note: This problem is adapted from an exercise problem one of us saw in a text. We do not recall the precise source.

Problem Scenario: Suppose a product, liquid hand soap, can be completely defined by two attributes, (1) the ability to moisturize, and (2) the ability to fight germs. The value of each attribute can range from 0 to 5 where a larger value indicates a higher level of the attribute. Thus, any product can be represented by a point in the perceptual space defined by a horizontal (X) axis representing the ability to moisturize, and a vertical (Y) axis representing the ability to fight germs. For example, a product which rates 2 on moisturizing ability $(X = 2)$ and 3 on germ fighting ability $(Y = 3)$ is given by the point $(2, 3)$ on the perceptual space (see figure 1). A product with a higher value of either X or Y is more costly to produce. Thus, while it is technologically feasible to market a product with $X = 5$ and $Y = 5$, such a product is likely to be very expensive and thus attract very few customers because of its high price.
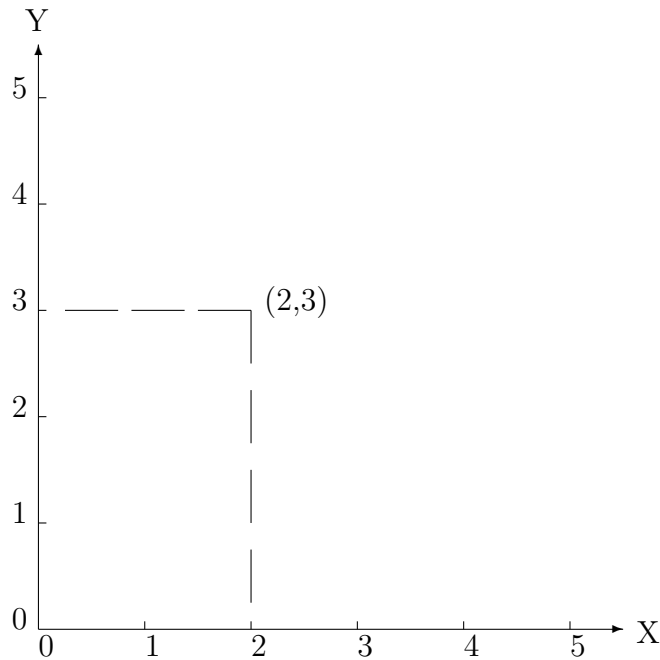

Figure 1

Nature of Market

(A) The Segments: There are 25 million consumers. Some consumers are more concerned with germ fighting ability of the product and others are more concerned with moisturizing ability. While every consumer would like to have a higher value of both germ fighting and moisturizing abilities, she also realizes that a higher value of an attribute will lead to a higher price. As a result, every consumer has an ideal product, defined by an **ideal point** in the perceptual space. There are two segments:

(1) Segment 1 consists of 15 million consumers. While the ideal points of all consumers in segment 1 are not exactly the same, they are tightly clustered around the point $(4, 2)$, i.e., a product that rates 4 on moisturizing ability, and 2 on germ fighting ability and. We call $(4, 2)$ the **ideal point of segment 1**.

(2) Segment 2 consists of 10 million consumers. The ideal points of consumers in segment 2 form a cluster around the point $(2, 4)$, i.e., a product that rates 2 on moisturizing ability, and 4 on germ fighting ability. We call $(2, 4)$ the **ideal point of segment 2**.

(B) Nature of Competition: You are planning to enter the market for liquid hand soap. At present there is only one product in the market, Sunlight, which is marketed by another company and is given by the point $(3, 3)$ in the perceptual space. Figure 2 graphically shows the position of Sunlight and the ideal points of segments 1 and 2.
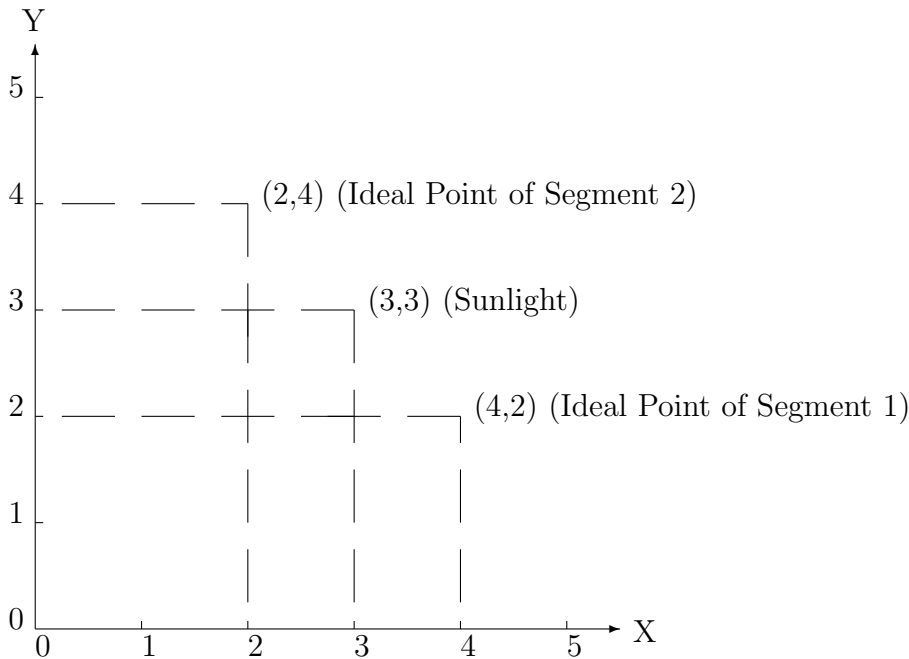

Figure 2

(C) Nature of Choice: Any consumer in the market will purchase **exactly one unit** of the product. If there is only one product available, she will buy that. If there are two or more products to choose from, the choice will depend on how attractive she finds the product

alternatives. Attractiveness depends on the segment she belongs to and increases if the product is closer to the ideal point of the segment. Thus, the attractiveness of a product to a consumer decreases as the distance between the point representing the product and the ideal point of the segment the consumer belongs to increases. We define **distance** and **attractiveness** as follows.

Distance: Consider any two points (X_1, Y_1) and (X_2, Y_2) in the perceptual space. Then, the distance between these two points is given by:

$$(1) \qquad d \quad = \quad \sqrt{(X_1 - X_2)^2 + (Y_1 - Y_2)^2}.$$

For example, consider the point $(2, 3)$. The distance between this point and the ideal point of segment 1 (i.e., $(4, 2)$), is given by: $d = \sqrt{(2 - 4)^2 + (3 - 2)^2} = \sqrt{4 + 1} = \sqrt{5} = 2.236$.

The distance between this point and the ideal point of segment 2 (i.e., $(2, 4)$) is given by:

$$d \ = \ \sqrt{(2 - 2)^2 + (3 - 4)^2} \ = \ \sqrt{0 + 1} \ = \ \sqrt{1} \ = \ 1.$$

Note that when we compute the distance between any two points, the computed distance does not depend on which one is called point 1 and which one is called point 2.

Attractiveness: Consider a consumer in a given segment. If a product has a distance d from the ideal point of that segment, then we define attractiveness as

$$(2) \qquad\qquad\qquad A \quad = \quad \frac{1}{1 + d^2}.$$

For example, the attractiveness of the product $(2, 3)$ to a consumer in segment 1 is given by:

$$A \quad = \quad \frac{1}{1 + (\sqrt{5})^2} \quad = \quad \frac{1}{6} \quad = \quad 0.167.$$

Similarly, the attractiveness of the product $(2, 3)$ to a consumer in segment 2 is given by:

$$A \quad = \quad \frac{1}{1 + 1^2} \quad = \quad \frac{1}{2} \quad = \quad 0.5$$

In computing the attractiveness in this example, I have used the distances computed earlier.

Market Share: For a given segment, we define market share of a product as the fraction of consumers in the segment who buy that product. For example, if 20% of consumers in segment 1 buy a given product, then that product has a 20% market share in that segment. Since every consumer is assumed to buy one unit of the product, it follows that if there is only one product available, that product will have a 100% market share. If there are multiple products to choose from, the market shares will depend on the relative attractiveness scores of the alternative products. For any given segment, a product which is closer to the ideal point of the segment, i.e, is "more attractive" to the segment, will have a larger market share of the segment. For a given segment, we model market share as follows:

Suppose there are n products with attractiveness scores (as given by equation (2)) $A_1, A_2, \ldots, A_n$ for the segment. Then, the market share of product i (with attractiveness score A_i) is given by:

$$(3) \qquad \text{MS}_i \quad = \quad \frac{A_i}{A_1 + A_2 + \ldots + A_n}.$$

For example, product 1 has market share $\text{MS}_1 = \frac{A_1}{A_1 + \ldots + A_n}$, etc. To determine **how many** consumers in a given segment will buy a product, you have to multiply the total number of consumers in the segment by the fraction of consumers in the segment who will buy the product. An illustrative example is provided after the description of the problem to solve.

Problem to Solve

Suppose you are planning to enter the market, and your only competition comes from the product $(3, 3)$ (that is, Sunlight). You have three action alternatives:

(1) Introduce only the product $(2, 4)$.

(2) Introduce only the product $(4, 2)$.

(3) Introduce both products $(2, 4)$ and $(4, 2)$.

Contribution (to profit): The total contribution (to profit) is defined as revenue (that is, $ sales) minus total variable cost. For every consumer who buys your product, you have a contribution margin (that is, unit price − unit variable cost) of $1. Your total contribution is therefore given by how many units you sell times unit contribution margin, that is, how many units you sell times $1 here. For example, if you have 5 million consumers from the two segments combined, your total contribution will be $5 million.

Fixed Cost: For every product you market, you incur a fixed cost of $4 million. Thus, for **each** of action alternatives 1 and 2, the fixed cost is $4 million (since only one product is marketed). For action alternative 3 (where two products are introduced), the fixed cost is $8 million.

Profit: Profit is defined as: Revenue − Variable Cost − Fixed Cost. This can also be expressed as: Profit = Total Contribution − Fixed Cost. For example, suppose you have introduced **one** product and have got 5 million consumers from the two segments combined. Then, your total contribution is $5 million, and your fixed cost is $4 million (because you are introducing just one product). Your profit will then be $(5 − 4)$ million, that is, $1 million.

Problem 1.(6 pt) Compute the distance of each of the three products $(2, 4)$, $(3, 3)$ and $(4, 2)$ from the ideal point of segment 1, i.e., $(4, 2)$. Based on these results, compute the attractiveness score of each of $(2, 4)$, $(3, 3)$ and $(4, 2)$ for consumers in segment 1.

Problem 2.(6 pt) Compute the distance of each of the three products $(2, 4)$, $(3, 3)$ and $(4, 2)$ from the ideal point of segment 2, i.e., $(2, 4)$. Based on these results, compute the attractiveness score of each of $(2, 4)$, $(3, 3)$ and $(4, 2)$ for consumers in segment 2.

Problem 3.(6 pt) Suppose you selected action alternative 1, that is, only introduce $(2, 4)$. (In this case, consumers in each segment have to choose between $(2, 4)$ and $(3, 3)$.) Compute what fraction of consumers in segment 1 will buy your product, and using this compute **how many** consumers in segment 1 will buy your product. Similarly, compute what fraction of consumers in segment 2 will buy your product, and using this compute **how many** consumers in segment 2 will buy your product. Compute the **total number of** consumers who will buy your product (compute the number of your customers for segment 1 and segment 2 and then add).

Problem 4.(6 pt) Suppose you selected action alternative 2, i.e., only introduce $(4, 2)$. (In this case, consumers in each segment have to choose between $(4, 2)$ and $(3, 3)$.) Compute what fraction of consumers in segment 1 will buy your product, and using this compute **how many** consumers in segment 1 will buy your product. Similarly, compute what fraction of consumers in segment 2 will buy your product, and using this compute **how many** consumers in segment 2 will buy your product. Compute **the total number of** consumers who will buy your product (compute number of your customers for segment 1 and segment 2 and then add).

Problem 5.(6 pt) Suppose you selected alternative 3, i.e, introduce both $(2, 4)$ and $(4, 2)$. In this case, consumers in each segment have to choose between $(2, 4)$, $(3, 3)$ and $(4, 2)$. Compute what fraction of consumers in segment 1 will buy your products (do it separately for your two products and then add), and use this to compute **how many** consumers in segment 1 will buy your products. Compute what fraction of consumers in segment 2 will buy your products (do it separately for your two products and add), and use this to compute **how many** consumers in segment 2 will buy your products. Compute **the total number of** consumers who will buy your product (compute number of your customers for segment 1 and segment 2 and then add).

Problem 6.(5 pt) Compute the profits for each of the three action alternatives (compute total contribution and subtract fixed cost). Clearly identify the action alternative that generates the largest profit for you.

Illustrative Numerical Example

This is an example to show you how market shares and demands are computed. Suppose the segments are as described in the problem, that is, segment 1 has 15 million customers with an ideal point $(4, 2)$, and segment 2 has 10 million customers with an ideal point $(2, 4)$. Suppose there are three products $(2, 3)$, $(4, 3)$ and $(3, 1)$. Let us call them products 4, 5 and 6, respectively (for example, product 4 is $(2,3)$). Let us analyze the segments separately.

Segment 1: Let d_{14}, d_{15} and d_{16} denote the distances of products 4, 5 and 6 from the ideal point of segment 1 (i.e., $(4, 2)$). Using equation (1):

$$d_{14} = \sqrt{(2-4)^2 + (3-2)^2} = \sqrt{5} = 2.236$$

$$d_{15} = \sqrt{(4-4)^2 + (3-2)^2} = \sqrt{1} = 1$$

$$d_{16} = \sqrt{(3-4)^2 + (1-2)^2} = \sqrt{2} = 1.414$$

Let A_{14}, A_{15} and A_{16} denote the attractiveness scores of products 4, 5 and 6 to consumers in segment 1. Using equation (2):

$$A_{14} = \frac{1}{1 + d_{14}^2} = \frac{1}{1 + 5} = 0.167$$

$$A_{15} = \frac{1}{1 + d_{15}^2} = \frac{1}{1 + 1} = 0.5$$

$$A_{16} = \frac{1}{1 + d_{16}^2} = \frac{1}{1 + 2} = 0.333$$

Segment 2: Let d_{24}, d_{25}, and d_{26} denote the distances of products 4, 5, and 6 from the ideal point of segment 2 (i.e., $(2, 4)$). Using the definition of distance given by equation (1):

$$d_{24} = \sqrt{(2-2)^2 + (3-4)^2} = \sqrt{1} = 1$$

$$d_{25} = \sqrt{(4-2)^2 + (3-4)^2} = \sqrt{5} = 2.236$$

$$d_{26} = \sqrt{(3-2)^2 + (1-4)^2} = \sqrt{10} = 3.16$$

Let A_{24}, A_{25} and A_{26} denote the attractiveness scores of products 4, 5 and 6 to consumers in segment 2. Using equation (2):

$$A_{24} = \frac{1}{1 + d_{24}^2} = \frac{1}{1 + 1} = .5$$

$$A_{25} = \frac{1}{1 + d_{25}^2} = \frac{1}{1 + 5} = .167$$

$$A_{26} = \frac{1}{1 + d_{26}^2} = \frac{1}{1 + 10} = .091$$

Market shares depend on which products are introduced to the market, as shown in the following two different scenarios.

Scenario 1: Suppose only products 4 and 5 have been introduced to the market.

	Segment 1 (Size = 15 million)		Segment 2 (Size = 10 million)		Total Demand (million)
	Market Share	Demand (million)	Market Share	Demand (million)	
Product 4 4	MS_{14} $= \dfrac{A_{14}}{A_{14} + A_{15}}$ $= \dfrac{.167}{.167 + .500}$ $= .25$	$.25 \times 15$ $= 3.75$	MS_{24} $= \dfrac{A_{24}}{A_{24} + A_{25}}$ $= \dfrac{.5}{.5 + .167}$ $= .75$	$.75 \times 10$ $= 7.5$	11.25
Product 5	MS_{15} $= \dfrac{A_{15}}{A_{14} + A_{15}}$ $= \dfrac{.500}{.167 + .500}$ $= .75$	$.75 \times 15$ $= 11.25$	MS_{25} $= \dfrac{A_{25}}{A_{24} + A_{25}}$ $= \dfrac{.167}{.5 + 167}$ $= .25$	$.25 \times 10$ $= 2.5$	13.75

Scenario 2: Suppose products 4, 5, and 6 have all been introduced to the market.

	Segment 1 (Size = 15 million)		Segment 2 (Size = 10 million)		Total Demand (million)
	Market Share	Demand (million)	Market Share	Demand (million)	
Product 4	MS_{14} $= \dfrac{A_{14}}{A_{14} + A_{15} + A_{16}}$ $= \dfrac{.167}{.167 + .500 + .333}$ $= .167$	$.167 \times 15$ $= 2.5$	MS_{24} $= \dfrac{A_{24}}{A_{24} + A_{25} + A_{26}}$ $= \dfrac{.5}{.5 + .167 + .091}$ $= .660$	$.660 \times 10$ $= 6.6$	9.1
Product 5	MS_{15} $= \dfrac{A_{15}}{A_{14} + A_{15} + A_{16}}$ $= \dfrac{.500}{.167 + .500 + .333}$ $= .500$	$.5 \times 15$ $= 7.5$	MS_{25} $= \dfrac{A_{25}}{A_{24} + A_{25} + A_{26}}$ $= \dfrac{.167}{.5 + 167 + .091}$ $= .220$	$.220 \times 10$ $= 2.2$	9.7
Product 6	MS_{16} $= \dfrac{A_{16}}{A_{14} + A_{15} + A_{16}}$ $= \dfrac{.333}{.167 + .5 + .333}$ $= .333$	$.333 \times 15$ $= 5$	MS_{26} $= \dfrac{A_{26}}{A_{24} + A_{25} + A_{26}}$ $= \dfrac{.091}{.5 + .167 + .091}$ $= .120$	$.120 \times 10$ $= 1.2$	6.2

Scenario for problems 1−5: Suppose you are a retailer of digital cameras. You purchase the cameras at $100/unit from the manufacturer and you buy exactly as many units as you sell to the ultimate customers. Your total fixed cost is $500,000. You have no other costs. Problems 1−5 are all based on the information provided above.

1.(2 pt) Compute the break-even quantity if you sell the cameras at $150/unit ($P = 150$).

2.(2 pt) Suppose you are using the "target profit method" of pricing. Compute the price if you wish to obtain $300,000 in profit by selling 10,000 cameras.

3.(5 pt) Suppose you sell 20,000 units of the product at a price of $150/unit. Compute each of the following quantities:

(a) The gross margin/unit

(b) The profit volume (PV) ratio

(c) The revenue

(d) The contribution to profit

(e) The profit

4.(6 pt) Suppose the number of units you sell is equal to the demand (Q), and that you sell 20,000 units if the price is $150/unit. Suppose the price elasticity of demand is −2, that is, each 1% increase (decrease) of price from $150/unit leads to a 2% decrease (increase) of demand. If you change the selling price to $156/unit from $150/unit, compute:

(a) The new gross margin/unit

(b) The new profit volume (PV) ratio

(c) The new demand

(d) The new revenue

(e) The new contribution to profit

(f) The new profit

5.(6 pt) Suppose, once again, the number of units you sell is equal to the demand (Q), and that you sell 20,000 units if the price is $150/unit. Suppose $\epsilon = -2$, that is, each 1% increase (decrease) of price from $150/unit leads to a 2% decrease (increase) of demand.

If you change the selling price to $147/unit from $150/unit, compute:

(a) The new gross margin/unit

(b) The new profit volume (PV) ratio

(c) The new demand

(d) The new revenue

(e) The new contribution to profit

(f) The new profit

6.(5 pt) Suppose a university needs to buy laptop computers and has asked local computer vendors to submit sealed bids. The lowest bid will be accepted. You are a computer vendor, and your total cost of supplying the personal computers as specified is $500,000. From your experience, you estimate the following probabilities of winning at various levels of the bid price:

Bid Price	Probability of winning the bid
$550,000	0.90
$600,000	0.80
$650,000	0.60
$700,000	0.40
$750,000	0.20
$800,000	0.10

Compute the expected profit at **each** of the bid prices given above. Clearly identify which of these prices will give you the largest expected profit.

7.($5 + 5 = 10$ pt) Suppose a school district has invited you to submit a sealed bid to supply classroom chairs, and your total cost of supplying the chairs as specified is $100,000. You plan to choose one of five bid prices, $110,000, $120,000, $130,000, $140,000, and $150,000.

You have obtained the bid ratios for 40 bids submitted by your competitors in the past:

Case	Bid Ratio	Case	Bid Ratio	Case	Bid Ratio	Case	Bid Ratio
1	1.415	11	0.838	21	1.404	31	1.258
2	1.533	12	1.039	22	0.842	32	1.197
3	1.416	13	1.097	23	1.488	33	1.042
4	1.594	14	1.296	24	1.137	34	1.064
5	1.248	15	1.414	25	1.483	35	1.074
6	1.588	16	0.819	26	1.287	36	0.901
7	0.928	17	1.136	27	1.47	37	0.892
8	1.382	18	0.818	28	1.168	38	1.032
9	1.052	19	1.08	29	0.86	39	0.922
10	1.084	20	1.141	30	1.301	40	1.229

7.(a) For each of the five bid prices (that is, $110,000, $120,000, $130,000, $140,000, and $150,000), compute the bid ratio (R), and estimate $P(R)$ as the fraction of past bid ratios that exceed that bid ratio.

7.(b) Suppose in addition to you, two other competitors will submit bids. Compute the proba-

bility that you will win at each of the five bid prices under consideration: $110,000, $120,000, $130,000, $140,000, and $150,000.

8.(2.5 + 2.5 = 5 pt) Suppose you are a marketer who sells laser printers. At present, your price is $300/unit, and the demand at this price is 25,000 units. Problems 8(a) and 8(b) are both based on this scenario.

8.(a) Suppose if you increase your price to $306/unit, your demand becomes 23,000 units. Compute the price elasticity of demand (ϵ).

8.(b) Suppose a competing marketer currently sells laser printers at $400/unit. If he changes his price to $410/unit and you keep your price same as before (that is, $300/unit), the demand for your product changes to 26,000 units from 25,000 units. Compute the cross elasticity of the demand of your product with respect to the price of the competing product.

9.(4 pt) Suppose demand Q (in number of units) at unit price P is given by

$Q = 400 - P$

Compute the price elasticity of demand (ϵ) at $P = 300$ as follows:

- Here, old $P = 300$. Compute old Q at this price using the formula provided.

- Increase price by 1% from Old P, that is, set new $P = 1.01 \times$ Old P.

- Compute new Q at the new price.

- Compute percentage change in price $= \dfrac{\text{New } P - \text{Old } P}{\text{Old } P} \times 100\%$

- Compute percentage change in demand $= \dfrac{\text{New } Q - \text{Old } Q}{\text{Old } Q} \times 100\%$

  Compute price elasticity of demand $\epsilon = \dfrac{\text{Percentage change in } Q}{\text{Percentage change in } P}$

Marketing 255 Fall 2012 Assignment 4
Total Points = 30, Friday, November 9, 2012

1.(5 + 5 + 5 = 15 pt) Ted Anderson is brand manager for the Cougar brand of tennis shoes. He has analyzed five likely magazines for use in advertising the Cougar brand and has collected the following data:

Magazine	Four-color Page Rate	Total readers	Readers Age 18−34	Readers Age 35−49
Tennis Today	$ 27,000	1,800,000	450,000	600,000
Court	$ 22,500	1,500,000	400,000	500,000
Tennis Pro	$ 16,200	900,000	360,000	270,000
US Sports	$ 54,000	2,700,000	1200,000	600,000
Racquet	$ 19,800	1,200,000	300,000	450,000

(a) Compute the CPM for each of the five magazines based on overall readership. Which magazine has the lowest overall CPM ? (Clearly state your answer. If two or more magazines are tied for the lowest CPM, identify all of them clearly.)

(b) Suppose Mr.Anderson wants to target readers of age 18−34. For this market, compute the CPM for each of the five magazines. Which magazine has the lowest CPM? (Clearly state your answer. If two or more magazines are tied for the lowest CPM, identify all of them clearly.)

(c) Suppose Mr.Anderson wants to target readers of age 35−49. For this market, compute the CPM for each of the five magazines. Which magazine has the lowest CPM? (Clearly state your answer. If two or more magazines are tied for the lowest CPM, identify all of them clearly.)

2.(2 + 2 + 2 = 6 pt) Suppose a television commercial for the Cougar brand of athletic shoes was broadcast for four weeks during August, 2012. During this time, 15 million people (out of a target audience of 20 million people) were exposed to the commercial and, on the average, each of these people (that is, people who were exposed to the commercial) was exposed to the commercial three times. What were the reach, frequency and GRP of this commercial?

3.(4 pt) (Workload Method) Acme Company has the following accounts:

Account Category	Number of accounts in Category	Frequency of calls needed	Number of calls needed in a year	Length of a call
A	200	once in a month	12	2 hours
B	800	once in 3 months	4	1 hour

An average salesperson works 40 weeks a year, 40 hours a week, and can spend 25% of this time on sales calls (the remainder is spent traveling, preparing reports, arranging delivery, etc.) Compute the number of salespeople Acme needs.

4.(5 pt) (Incremental Method) Suppose the marginal cost of adding another salesperson is $100,000, and you have the following information:

Number of Salespeople	Revenue ($1000)	Cost unrelated to Salesforce ($1000)
0	0	0
1	250	50
2	490	100
3	710	150
4	910	200
5	1090	250
6	1250	300
7	1390	350
8	1510	400
9	1610	450
10	1690	500

Using the incremental method, determine the number of salespeople needed.

Definitions:

1. CPM (cost per thousand) is defined as:

$$\frac{\text{Cost of Commercial}}{\text{Number of target customers reached by commercial}} \times 1000$$

2. Reach: Fraction of target customers exposed to the commercial in a specified time period, usually four weeks, multiplied by 100. For example, if 6 million out of a target population of 15 million are exposed to the commercial, then reach is $\frac{6}{15} \times 100 = 40$.

3. Frequency: Consider the members of the target market who are reached by the commercial. The frequency is the average number of times a member of this group is exposed to the commercial in the time period specified. Suppose for example, considering only the people exposed to the commercial in the specified period, one was exposed five times on the average. Then, frequency is 5.

4. Gross Rating Point (GRP): Reach multiplied by frequency. For example, if reach is 40 and frequency is 5, GRP is $40 \times 5 = 200$.