Meeting 5  Student’s Booklet

Hotel Management

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STUDENT’S BOOKLET

UC IRVINE MATH CEO
http://www.math.uci.edu/mathceo/
Summary - Memorial Day at Hotel

Total Rooms 150 (100%)
Occupied: 120 (80%)
90 Small 3pp average
30 Large 5pp average
Total 3.5pp av.

Occupied Rooms:
Small: 90/120: 75%
Large: 30/120: 25%
Ratio is 3:1

Revenue
90 Small $11340
30 Large $4260
Total $15600

Expenses Per Room Total
Sales $3 (7.5%) $360
Frontdesk $5 (12.5%) $600
Food & B. $5 (12.5%) $600
Housekeeping $20 (50%) $2400
Maintenance $7 (17.5%) $840
Total $40 (100%) $4800

Profit: 15600 - 4800 = $10800

Food
Clients: 168
(40% of 120, times 3.5)
Recipe: Lean Beans
Cooking Time: 97.5 minutes

Housekeeping
Cleaning assistants: 8
Cleaning times
A small room: 30 m
A large room: 40 m
Average: 32.5 m
Hotel A (150 rooms)

Sales

Front Desk

Food & Beverage

Housekeeping

Maintenance
A large group from a Circus Convention will stay at the hotel. You have received a distribution of people, which have requested to book a number of small rooms such that there are 3 people per room in average. How many rooms should we book?

Find the total revenue for these small rooms, given a discount chart for groups, depending on the number of rooms, and this year’s base price of $140 per room.

Ask the Frontdesk Department about the total of rooms to be occupied, including the 90 small rooms plus some new large rooms, which can be charged a higher fare. If you want the revenue for all occupied rooms to be equal to $15600, what is the unit price of each room of the new large ones?

During last year’s Memorial Day the hotel rented 100 rooms for a base price of $140 (before applying the discount as in the chart). How does last year’s revenue compare to the revenue obtained for the 90 small rooms this year? Can you compare in terms of percentages? Remember to use the Discount chart.
We want exactly 80% of the total 150 rooms of the hotel to be booked. Find this number. This is your target. What is 80% in terms of fractions?

Sales tells you that 90 rooms have been booked for a Circus convention, all small rooms. Find how many more rooms we need to meet the occupancy goal of 80%. Color these rooms in the given map of the Hotel. If all these rooms are large and are occupied, what percentage of the occupied rooms are large?

Ask the Sales Department for the average occupancy in the 90 small rooms where people from the Circus convention will stay. You receive an email with the information of the occupancy in the new large rooms. What is the average occupancy per room (considering all occupied rooms)?

The Sales Department has determined the unit price of the rooms: $126 for small rooms, and $142 for large rooms.

Confirm these figures to the Sales Department (just to double check), and use it to find the average unit price (considering all occupied rooms).
3. FOOD & BEVERAGES DEPARTMENT (MEMORIAL DAY)

If we have 120 rooms occupied on Memorial Day and each room has an average of 3.5 guests, how many guests can we expect to serve at the restaurant that day if 40% of the guests eat in the restaurant?

The Food and Beverages Department plans to serve one of the following meals: Potato Obligato, Lean Beans or Nice Rice. Given is a graph of the cooking time of these dishes, depending on the number of people (of course, the more people, the more time it takes to cook)

Choose the dish that takes the least time to cook. Also, determine the cooking time, so that you can plan ahead.

Given is a recipe for “Lean Beans”, which serves 8 people. Based on the expected number of people in the restaurant, which quantities of each ingredient do we need to prepare?

Maintenance tells you a total of ingredients that can give you to make Pinevocado Tomacos, which will be free for clients.

Using the recipe for these, what percentage of the people will get a Pineavocado Tomaco?

(Partial dishes are not served: it’s all or nothing!)
4. HOUSEKEEPING DEPARTMENT (MEMORIAL DAY)

We spend 30% cleaning the bathroom, 20% making beds and 50% sweeping. (i) What fraction of the sweeping time is the time spent in making beds? (ii) What percentage of the “sweeping time” is the “cleaning the bathroom time”? (iii) If cleaning a large room takes 40 minutes, find the time spent not making the beds.

If we have 120 rooms occupied on Memorial Day, what is the least number of attendants we need to hire to clean all 120 rooms if each attendant can clean a maximum of 16 rooms in a day?

Given a small hotel room (27 feet x 14 feet), how much time do you spend sweeping if you spend 1 minute cleaning a 16 sq feet area? Note: You don’t need to take the bathroom nor the beds into account. Each bed is approximately 5 feet x 6 feet.

A small room takes 30 minutes to clean, and a large room takes 40 minutes to clean. Knowing that 3/4 of the occupied rooms are small, find the average time it takes to clean a room in Memorial Day. Note: the answer is not 35, because we don’t have the same number of small and large rooms!

To verify the result, use the hotel map provided to:

i) Circle groups of 4 rooms each, so that each group takes the same cleaning time (balanced groups). How many groups did you get? (You must cover all rooms)

ii) If you look at just one group, what is the average cleaning time each room?

iii) What can you conclude about the total average cleaning time?
5. MAINTENANCE DEPARTMENT (MEMORIAL DAY)

You heard that the restaurant wants to make Pine-vocado Tomacos “Pineapple, Avocado, Tomato tacos”. You have a budget of $46 to spend in tomatoes, avocados and pineapples. You will buy this in a ratio of 6:4:1. Given the costs at the market, list how many of each fruit you will buy.

Last year your department spent $0.59 per room. If this year you spend $0.65 per room, approximately which percentage increase are we talking about?

Ask Sales Department for the total number of occupied rooms. How much can you spend on supplies (bulbs, cleaning supplies, batteries, paint, etc.) if you are allowed $0.65 for every occupied room?

Given is some data on the maintenance needed for the rooms today:

i) 1 out of 15 rooms need to replace a bulb, due to an electrical problem.
ii) 4 out of each 12 rooms need a new water bottle.
iii) 20% of the rooms, randomly chosen, will receive a new Shampoo that is being tried out, to later ask clients what they think about it.

Based on this, make a list of all items needed today and distribute them into equal packages for all the cleaning assistants. Ask the Housekeeping Department for the number of cleaning assistants that will come.
Springhill Suites Anaheim
The Circus Convention comes to the Hotel!
Request: Average number of people per room: 3
Spring Hill Suites Anaheim
Discounts for Groups (small rooms)
Base Price: $140 per room

<table>
<thead>
<tr>
<th>Number of rooms</th>
<th>Total Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-59 rooms</td>
<td>5%</td>
</tr>
<tr>
<td>60-79 rooms</td>
<td>8%</td>
</tr>
<tr>
<td>80-99 rooms</td>
<td>10%</td>
</tr>
<tr>
<td>100+ rooms</td>
<td>15%</td>
</tr>
</tbody>
</table>
Spring Hill Suites Anaheim (150 rooms)

Small rooms

Large rooms
Spring Hill Suites Anaheim (150 rooms)

Floor 1 and 2

Each floor: area 1, 2, and 3
Spring Hill Suites Anaheim

Occupancy in the 30 large rooms

<table>
<thead>
<tr>
<th>Room 91</th>
<th>Room 92</th>
<th>Room 93</th>
<th>Room 94</th>
<th>Room 95</th>
<th>Room 96</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Room 97</td>
<td>Room 98</td>
<td>Room 99</td>
<td>Room 100</td>
<td>Room 101</td>
<td>Room 102</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Room 103</td>
<td>Room 104</td>
<td>Room 105</td>
<td>Room 106</td>
<td>Room 107</td>
<td>Room 108</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Room 109</td>
<td>Room 110</td>
<td>Room 111</td>
<td>Room 112</td>
<td>Room 113</td>
<td>Room 114</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Room 115</td>
<td>Room 116</td>
<td>Room 117</td>
<td>Room 118</td>
<td>Room 119</td>
<td>Room 120</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>
Cooking Times

- Potato Obligato
- Lean Beans
- Nice Rice

Time (in minutes):

- 15
- 30
- 45
- 60
- 75
- 90
- 105
- 120
- 135
- 150
- 165
- 180
- 195
- 210
- 225

- 1h
- 1.5h
- 2h
# Lean Beans

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cans of Black Beans</td>
<td>1</td>
</tr>
<tr>
<td>Small onions</td>
<td>3</td>
</tr>
<tr>
<td>Tbs of chopped cilantro</td>
<td>2</td>
</tr>
<tr>
<td>Cloves of garlic</td>
<td>2</td>
</tr>
<tr>
<td>Tsp of cayenne pepper</td>
<td>0.25</td>
</tr>
<tr>
<td>Tsp of salt</td>
<td>0.5</td>
</tr>
</tbody>
</table>

| Serves                      | 8 people |
Springhill Suites Anaheim
Room Map (Small room)
<table>
<thead>
<tr>
<th>Fruit</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pineapple</td>
<td>1</td>
<td>$4</td>
</tr>
<tr>
<td>Avocado</td>
<td>3</td>
<td>$6</td>
</tr>
<tr>
<td>Tomato</td>
<td>5</td>
<td>$2.50</td>
</tr>
</tbody>
</table>
1  EXERCISING

Our Goals:
Calculate percentages of a total
Given a percentage of a total, calculate the corresponding value

Discuss in your group

- Do you exercise? How often? Which activities do you do?
- If I ate a brownie (132 calories) and I want to burn 75% of its calories, how many calories should I burn?
- Loren wants to be healthy and decides to work out. During an 50 minute interval, she runs for 41 minutes. What percentage of the time did she run?

Why Exercise?
1. Boost your happiness
2. Learn to set and achieve goals
3. Reduce your risk of heart disease
4. Sleep better
5. Get an energy boost
6. Increase strength and flexibility
7. Improve memory
8. Increase self-confidence
9. Perform better at school
10. Become resistant to disease
11. Live longer
1 MEMORIAL DAY (SALES)

SOLUTIONS TO SALES DEPARTMENT PROBLEM SET:

a) A large group from a Circus Convention will stay at the hotel. You have received a distribution of people, which have requested to book a number of small rooms such that there are 3 people per room in average. How many rooms should we book?

Solution: Adding up people we get 270. Since the average per room is 3, we get **90 rooms**.

b) Find the total revenue for these small rooms, given a discount chart for groups, depending on the number of rooms, and the base price of $140 per room.

Solution: By a, there are 90 rooms, so the discount is 10%. 10% of 140 is 14, so 140-14 = 126 is the price per room. To find the revenue, we multiply the number of rooms by the unit price: 90 x 126 = 9 x 1260 = 12600 - 1260 = **$11340**.

TIP: Explain how to multiply by 9 fast. Ex: 13x9 = 130 - 13 = 117.

c) Ask the Frontdesk Department about the total of rooms to be occupied, including the 90 small rooms plus some new large rooms, which can be charged a higher fare. If you want the revenue for all occupied rooms to be equal to $15600, what is the unit price of each room of the new large ones? **[Need 2a]**

Solution: Frontdesk gives that 120 rooms are occupied.

Since revenue for first 90 rooms is 11340, then we subtract: 15600 - 11340 = 4260, so this is the revenue for the new 30 rooms. Divide by 30 to get the desired unit price of each new room:

\[
\frac{4260}{30} = \frac{426}{3} = \frac{(300 + 126)}{3} = 100 + \frac{(90+36)}{3} = 100 + 30 + 12 = 142. \text{[Can use alternative decompositions to perform this division. Another way:]} \frac{426}{3} = \frac{(450 - 24)}{3} = 150 - 8 = 142.
\]

d) Last year on Memorial Day the hotel rented 100 rooms for an average unit price of $128. How does that revenue compare with the revenue obtained for the 90 small rooms? Can you compare in terms of percentages?

Solution: Last year: Revenue of 128 x 100 = 12800. This year: Revenue of 15600. So 4260 more. Since 42600 is approximately one third of 12800, we can talk about a 33% increase in the revenue, which is good!
1 MEMORIAL DAY (FRONTDESK)

SOLUTIONS TO FRONTDESK DEPARTMENT PROBLEM SET:

a) We want exactly 80% of the total 150 rooms of the hotel to be booked. Find this number. This is your target. What is 80% in terms of fractions?

Solution: 80% of 150 is 120. 80% is 4/5. One way: 10% of 150 is 15 (because 10% is 1/10). So 80% will be 8 times 15. To multiply by 8, we duplicate three times: 15 → 30 → 60 → 120.

Another way: 80% is 4/5 as a fraction. So we can compute four fifths of 120, which is removing one fifth of 120 to 120. For this, first find one fifth of 150, which is 150/5. 15/5=3, so 150/3=30. So 150-30=120 is the number we seek.

b) Sales tells you that 90 rooms have been booked for a Circus convention, all small rooms. Find how many more rooms we need to meet the occupancy goal of 80%. Color these rooms in the given map of the Hotel. If all these rooms are large and are occupied, what percentage of the occupied rooms are large?

Solution: We just subtract: 120 - 90 = 30.

Check: 30 + 90 = 120 (total occupied rooms)

To find the percentage of occupied rooms that are large, notice that 30 of 120 are large. We can use ratios, fractions or percentages directly to find this percentage, which is 25%.

Way 1: Use ratios: 30 : 120 is same as 3:12, same as 1:4. Now, 1 of 4 corresponds to 25%, because 100 is 4 times 25.

Way 2: Fractions: 30/120 is 3/12, which is 1/4. One fourth in fractions is 25%, because 1/4 equals 25/100.

Way 2: Percentages: 120 is 100%, and we need to see what 30 corresponds to. Notice that 12 is 10%, so 6 is 5%, so 30 (which is 6 times 5) is 25% (5 times 5). Or: 30 = 12 + 12 + 6 → 10% + 10% + 5% = 25%.

No matter how you solve the problem, make sure to check that your solution is correct (by multiplying 30 by 4 to obtain 120).
c) Ask the Sales Department for the average occupancy in the 90 small rooms where people from the Circus convention will stay. You receive an email with the information of the occupancy in the new large rooms. What is the average occupancy per room (considering all occupied rooms)?

Solution: The average for small rooms is 3, while you can check that the average for the large rooms is equal to
Take home Family Project:

You can do problem 1 or problem 2 (No need to do both)

Create A Recipe:
Come up with a recipe with your family.

The recipe can be no more than 600 calories per serving.
Must contain no more than 40% of your daily value of fat and no more than 40% of your daily value of carbohydrate. Have fun & be creative!

Here is a link to find the nutrient information for your food item.
https://ndb.nal.usda.gov/ndb/
http://www.calorieking.com/foods/
**Build Your Own Burger!**

It's dinner time and you are craving a burger for dinner! You decide to go to the kitchen and make yourself the ultimate burger. To build your Burger *choose one ingredient* from each section (including a side).

Find 2 different options between 350 and 400 calories.

<table>
<thead>
<tr>
<th>Patty</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef Patty</td>
<td>305</td>
</tr>
<tr>
<td>Grilled Chicken Patty</td>
<td>210</td>
</tr>
<tr>
<td>Salmon Burger</td>
<td>170</td>
</tr>
<tr>
<td>Veggie Burger</td>
<td>165</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bread</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Bread Bun</td>
<td>120</td>
</tr>
<tr>
<td>Whole Wheat hamburger Bun</td>
<td>130</td>
</tr>
<tr>
<td>lettuce wrap bread</td>
<td>80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toppings</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lettuce (2 leaves)</td>
<td>8</td>
</tr>
<tr>
<td>Tomato slice</td>
<td>5</td>
</tr>
<tr>
<td>Guacamole</td>
<td>80</td>
</tr>
<tr>
<td>Mayo</td>
<td>100</td>
</tr>
<tr>
<td>Ketchup</td>
<td>10</td>
</tr>
<tr>
<td>Bacon Strip</td>
<td>70</td>
</tr>
<tr>
<td>Cheddar Cheese</td>
<td>75</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sides</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fries (med)</td>
<td>312</td>
</tr>
<tr>
<td>Sweet Potato Fries</td>
<td>90</td>
</tr>
<tr>
<td>Apple Slices</td>
<td>90</td>
</tr>
</tbody>
</table>