



Brain Teasers

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It is important in the case interview to be able to make educated “guesstimates” and come up with creative solutions to business problems.

Below are two examples that will help you think through the process of arriving at reasonable estimates. Your estimates can be very helpful when used in analyzing the problem you will encounter in a typical case interview.

The third question is a brainteaser. It shows the need to be creative when tackling any case problem.

Q: How many pay phones are there on the island of Manhattan?

A: A logical place to begin your analysis might be to ballpark the number of pay phones on Manhattan street corners. If you think of New York City as a grid of streets, you might guess it is about 300 streets long (north to south) by ten streets wide (east to west), so it has approximately 3,000 intersections. You might then assume there is one pay phone for every two intersections, for a total of about 1,500 pay phones.

If you're feeling really creative, you might subtract the number of intersections that are “invalidated” because they fall in the area of Central Park. Say Central Park is ten blocks long by two blocks wide, or 20 intersections. Using your one-pay-phone-for-every-two-intersections assumption, you would want to subtract ten pay phones from the original 1,500.

You might then add to the 1,490 the number of pay phones that might be found in restaurants, hotels, schools, hospitals, and office-building lobbies.

Q: How many hotel-sized bottles of shampoo and conditioner are produced each year around the world?

A: You might begin by assuming that hotel-sized bottles are produced for two purposes only:

1. To supply hotels and upscale motels
2. To provide samples for gift packs, salons, and so on

You would then want to start by estimating the number of hotels and motels around the world that offer the products to

their guests. One way of estimating the number of hotels is to assume that hotels are found predominantly in major cities and resorts. Figure that there are 2,000 major cities and resorts around the world, an average of ten for each of the world's approximately 200 countries. Assume that each city averages 20 hotels that offer bottled hair products to their guests. Multiplying 20 by 2,000 gives you 40,000 hotels around the world that require shampoo and/or conditioner for their guests.

To understand how many bottles of shampoo and conditioner the 40,000 hotels require, you now need to estimate the total number of uses each hotel on average represents. You can arrive at that number through the following calculation: assume that there are 100 rooms in each hotel, and that those rooms are occupied 50 percent of the time. Multiplying 40,000 by 100 by 0.5 by 365 (don't forget the number of days in the year!) gives you approximately 750 million.

However, it is probably reasonable to assume that a guest staying for longer than a day will not use a whole shampoo bottle every day. If you assume that an average of one shampoo bottle is used for every two occupied days in a given room, you can now divide your 750 million estimate in half to 375 million. To get to the number of bottles of conditioner, estimate a ratio between the use of shampoo and the use of conditioner. Since many of us do not condition every time we shampoo, you might assume that the ratio is 2:1. Dividing 375 million in half gives you approximately 190 million. Your conclusion would then be that 375 million bottles of shampoo and 190 million bottles of conditioner are required for hotel use every year.

To estimate the total market size, you can probably make things easy on yourself by assuming that the number produced for sample purposes is a small percentage of the total, say ten percent. Combining your two markets would give you approximately 400 million bottles of shampoo and 210 million bottles of conditioner.

Finally, you might want to "reality check" your total figure. Assuming 610 million bottles are produced and sold each year at an average price of 25 cents each, the worldwide market for miniature bottles of shampoo and conditioner is about \$150 million. Does that sound reasonable?

Q: You are in a room with three light switches, each of which controls one of three light bulbs in the next room. Your task is to determine which switch controls which bulb. All lights are off. Your constraints are: you may flick only two switches and you may enter the room with the light bulbs only once. How would you set about

determining which switch controls which bulb?

A: To solve this riddle you must do some out-of-the-box thinking. The best way to determine which light bulb is which is to flick one switch on, wait for five minutes and flick it off. Then flick one of the remaining two switches on and leave the other off. When you enter the room with the bulbs, you can determine which switch controls which of the two lights that are off by feeling to see which of the bulbs is hot (from having burned for five minutes).

Other creative solutions involve pushing the constraints of the game. You might ask if the room you're in has a phone, so you could call somebody to help you. You might ask if the rooms have a connecting window. You might assume you can leave the first room a number of times, and therefore go out, buy a drill, and bore a hole through the wall so you can see which light bulb is connected to which switch. Or, you might buy a mirror and place it strategically outside the door to guide you.

Remember, you are limited only by your imagination.

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