

## Making Assumptions

An assumption is something that you assume to be the case, even without proof. For example, people might make the assumption that you're a nerd if you wear glasses, even though that's not true.

Most of the problems that we face in our everyday lives are ill-defined to some degree. For example, what to do for your child's birthday party, what to cook for supper, and how to ensure that you will have a continuous and plentiful supply of drinking water are all, in varying degrees, ill-defined problems. A main difference between well-defined and ill-defined problems is the degree to which they are constrained. A problem's constraints can determine which information is relevant to the problem, and what operations can be done in solving the problem. One of the basic techniques used to solve ill-defined problems is to make assumptions that are subjective and which can help in making the problem more defined, limit its size and turn it into a well-defined and manageable problem.

People who can solve problems which are defined well may not necessarily be good at solving ill-defined problems in the same domain since they may not have the skill of making the assumptions that can make these problems more defined.

Broadly, there are three kinds of assumptions:

- Conclusions: "I assume you're going to play soccer since you have your ball with you"
- Partially established propositions: "I assume all cats can meow,"
- Adoptions: "He assumed an air of royalty".

Partially established propositions are frequently used for the problem-solving process. Such assumptions can take form of facts or principles, the truth of which is taken for granted without insistence upon specific proof. They are made up by problem-solvers to allow them to advance towards their goal by

utilizing relationships or data which is useful to them even though they are not known to be correct. Often the veracity of these assumptions can be checked once a solution to the given problem is reached.

So many textbooks are based on well-defined problems that are less complex to solve compared to real world problems which often don't have definitive boundaries. Therefore, during the recruitment process, panellists challenge candidates to step out of their comfort zones by asking them to crack practical problems that involve making assumptions.

The aim while making assumptions is to simplify the problem at hand. Just remember that the assumptions that are made must be reasonable. For example, if asked about the car sales made in London in one year, a candidate might assume that a typical English household has three members on an average. This might not be accurate but it surely sounds reasonable and useful for calculating the annual car sales. By contrast, assuming that everyone in the United Kingdom holds a driver's license sounds unreasonable.

Ultimately, you will have to use your own judgement in making assumptions. For example, in order to calculate the car sales in London, if one has already assumed that a typical household in the United Kingdom has three members, then it would be reasonable to further assume that each family owns one car and replaces it every six years.

Listed below are some assumptions which are routinely made in business consulting estimations:

- Even Distribution of Age Brackets

It can be assumed that there are equal number of people in age brackets of the same width i.e., 0-10, 20-30, 30-40.....70-80.

Or, of the width 0-1, 1-2, 2-3, 3-4.....79-80.

Assume whichever one works to your advantage while solving the problem.

As an example, if you are asked to estimate the market size of coffee cups that are sold in the U.S., you might say, *“I am going to assume a U.S. population of roughly 300 million people divided equally among the 0-20, 20-40, 40-60, and 60-80 age range”*. Remember to always justify your assumptions: *“I am going to assume we can capture 10 percent market share, because of x and y reasons”*.

- Average Lifespan

It can be assumed that all individuals live for exactly 80 years.

	World	Europe	Asia	North America	South America	Africa	China	India	Japan	U.K.
Population	7.6B	0.7B	4.5B	1.0B	0.9B	1.2B	1.4B	1.4B	1.3B	0.7B
Life Expectancy	72	80	72	78	75	53	73	70	84	81
People per Household	3.2	2.3	3.5	2.6	3.1	5.5	3.2	3.5	1.2	2.4
Median Household Income	\$1,200	\$25,000	\$1,500	\$20,000	\$12,000	\$2,000	\$10,000	\$5,000	\$25,000	\$20,000
GDP	\$75T	\$15T	\$25T	\$20T	\$15T	\$3T	\$10T	\$3T	\$4T	\$3T
GDP Growth Rate	3%	1%	5%	2%	3%	7%	6%	7%	-0.1%	1%
% Married Adults	55%	75%	50%	65%	60%	40%	60%	55%	60%	70%
% Population Under 18 Years	28%	15%	25%	20%	22%	35%	25%	28%	12%	15%

% Population  
Over 65 Years

- Market Sizing

For market sizing interview questions (for example – How many gas stations are there in India?), you'll be more effective if you memorized a list of common assumptions. It'll save you from asking the interviewer for basic information. The chart shown below can be populated with the most up to date information and used for reference when needed.