

## Preface

How much is this book worth to you?

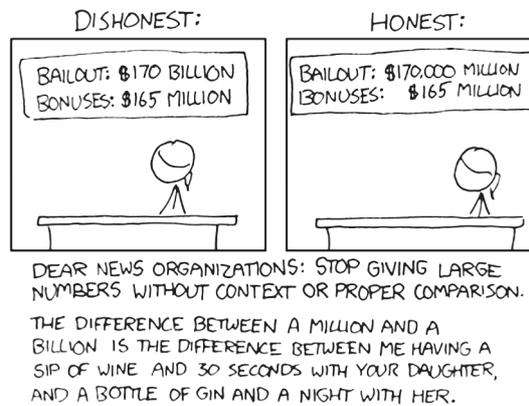
That is a typical estimation question. You are not looking for a precise answer. Your answer will help determine a future action (e.g., buying the book or not). And you can answer it in several different ways. For example, you could consider the value of finally knowing the answer to that age-old question, “paper or plastic?” once and for all, so that you no longer need to agonize over it at the grocery store. You could consider the value of improving your estimation abilities, either as an enjoyable pastime or as a useful business skill. You could consider the value of whiling away a few hours, thinking about interesting problems and reading amusing solutions. Lastly, you could consider the value of acing that job interview with Google. If this book does help you get that high-flying job, please let me know (I promise not to charge you more for it).

If you estimate that the value of this book is more than its cover price, then I hope you will buy it. If you estimate that its value is less than its price, then I hope you will not buy it (or that you will be pleasantly surprised when reading it).

This book continues where the popular and widely reviewed *Guesstimation* leaves off. We’ll look at practical questions such as the value of the solar panel on a Prius and how far we should walk to recycle that water bottle. We’ll look at impractical questions such as how far a mousetrap-powered car could travel and whether there are more brains or air in a movie theater. We’ll develop the ability to see the news and identify the numerical bovine coprolites (BS, that is).

In addition to learning how to estimate for fun and profit, we'll become a lot more familiar with big numbers. These numbers are all around us, and some of them are even important. There are a billion people in China. The federal budget deficit is a trillion dollars. The president was paid a million dollars. After a while all these zillions sound the same. However, a trillion is a thousand times bigger than a billion, which is a thousand times bigger than a million. A factor of a thousand is a lot. If you make \$50,000 a year, then you probably don't worry too much about spending \$50 for something important. Similarly, if the federal budget deficit is \$1 trillion, then we probably shouldn't worry too much about spending \$1 billion for something important (assuming that we can agree on what is important).

Randall Munroe of xkcd.com, describes in a web comic the difference between a million and a billion more graphically.



Recognizing that a billion is *much* larger than a million can help you avoid some embarrassing errors. For example, in May 2010 the Dow Jones Industrial

average plunged one thousand points in just a few minutes. According to the *New York Times*, “Federal officials fielded rumors that the culprit was a single stock, a single institution or execution system, a \$16 billion trade that should have been \$16 million” [1]. Oops.

By the way, Google really does use questions like the following in job interviews. How many golf balls can fit in a school bus? How many piano tuners are there in the whole world? [2, 3]. If you can answer questions like these, you will be more attractive to companies like Google because it shows that you are a flexible thinker, are willing to attack imprecise questions, and can apply your knowledge to real-world questions.

And you will finally know the answer, if not to the question of “life, the universe, and everything” [4], then at least to the question of “paper or plastic?”