

Problem 4

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Using Fermi estimation guess how likely it is that a STEM researcher will win the Nobel Prize in the future:

About 10 million people work as researchers around the world. This includes researchers, scientists, and professors from many fields. Every year, the Nobel Prizes in Physics, Chemistry, and Medicine or Physiology are given out three times. Let's say that researchers are evenly spread out among the three Nobel Prize categories: chemistry, medicine/physiology, and physics. The average length of a study job is 40 years, and only about 1 in 1,000,000 experts win the prize each year.

Calculation:

We can guess that there are about 3.3 million researchers in each of the three groups since the researchers are evenly split between them (10 million divided by 3). Based on a chance of 1 in 1,000,000, we can guess that every year about 3.3 researchers (3.3 million split by 1,000,000) in each group win the Nobel Prize. Assuming that a researcher's career time is about 40 years, we can guess that about 132 researchers (3.3 researchers times 40 years) in each area win the Nobel Prize during their career. We split the number of researchers who win the Nobel Prize over the course of their work by the total number of researchers in that field to get an idea of how likely it is that a single STEM researcher will win the prize. Based on this, there is a 0.004% chance that a STEM researcher will win the Nobel Prize at some point in their work (132 researchers / 3.3 million).