

 Navigate

# Guesstimates

Off late, guesstimates (stands for Guess + Estimate) have emerged as a really powerful tool to assess a candidate on following 4 parameters -

1. Structured Problem-Solving
2. Logical Reasoning
3. Numerical Capabilities
4. Communication Skills

In a guesstimate, you are required to arrive at an estimate of something (say the total number of emails written in the world in a day) without access to adequate or complete information. A guesstimate is essentially a back of the envelope calculation or a rough approximation when the information required to arrive at an accurate answer is missing.

In a guesstimate, more than the actual answer you arrive at, an interviewer is more interested in the approach you take to arrive at the answer and evaluates you on the 4 parameters listed above.

## TIP 1

Think out loud - When a guesstimate is given to you to solve, don't just do the calculations in your mind and mumble out the final answer. Take the interviewer through how you are thinking about the problem and talk him through each step of the calculation you are performing.

## TIP 2

Make educated guesses - For example, while trying to estimate number of emails per day in the world, it is reasonable to assume world's population to be 7Bn, or assume number of average emails one writes in the day to be based on what you have seen in your day to day life (your friends, professors, colleagues, companies etc.)

## TIP 3

Always sense check your final answer - For example, while trying to estimate the number of emails per day in the world, if you arrive at 700 Bn as the final answer then ask yourself if that makes sense. It does not because everyone in the world (including infants, since world's population is 7 Bn) can not be receiving 100 emails a day on an average.

## Sample Questions and Answers

Given below are some examples of guesstimates that should help you practice. As you can see, when it comes to guesstimates, the questions are limited only by your imagination. Again, there is **no one right answer for a guesstimate**.

**Q1. Estimate the number of emails sent in the world everyday.**

Type your answer here.

Show/Hide Answer

Instead of estimating number of emails 'sent' per day, we'd try to estimate number of emails 'received' per day as the emails are sent by companies also (say a newsletter to subscribers) and volumes of such emails may be difficult to estimate, but emails are *always* received by individuals.

1. Assume the world population to be 7Bn i.e. 7000 Mn
2. Assume world population to be *evenly* distributed between age-group 0-70 meaning there are 100Mn people of each age between 0 and 70 in the world (7000 Mn divided by 70)
3. Assume only people between age 11-50 need internet *if* it was available
4. Assume the distribution of world's population among developed countries, developing countries, and under-developed countries to be 15%, 70%, and 15% (symmetrical normal distribution). This tri-furcation is needed as internet penetration is linked to development (common sense, something that we often read).
5. Assume internet penetration to be 80%, 20%, 5% in developed, developing and under-developed countries (I only remember reading India's number to be 20% somewhere, rest is pure guess work)
6. Assume internet usage behaviour to be same across men and women (BIG assumption, especially in less developed countries)
7. Assume people between age group 11-20 are students with only 1 primary email id receiving 10 emails a day including spam emails (based on what I see among my friends)
8. Assume people between age group 21-50 to be office goers with 1 primary personal email (again receiving 10 emails a day) and 1 primary office id receiving 25 emails a day (again based on what I hear/see of my seniors)
9. Number of people in age group 11-20 in developed countries =  $100 \times 10 \times 15\%$  Mn (population distribution) = 150 Mn
10. Number of people in age group 11-20 in developed countries with internet access =  $150 \text{ Mn} \times 80\%$  (internet penetration) = 120 Mn
11. Number of emails received by age group 11-20 in developed countries =  $120 \times 10$  (per person emails per day) = 1200 Mn = 1.2 Bn
12. Similarly number of emails received by age group 21-50 in developed countries on **both** their ids =  $100 \times 30 \times 15\% \times 80\% \times (10+25)$  (total email on both the ids)  $\sim 12$  Bn
13. Number of people in age group 11-20 in developing countries =  $100 \times 10 \times 70\%$  Mn (population distribution) = 700 Mn
14. Number of people in age group 11-20 in developing countries with internet access =  $700 \text{ Mn} \times 20\%$  (internet penetration) = 140 Mn
15. Number of emails received by age group 11-20 in developing countries =  $140 \times 10$  (per person emails per day) = 1400 Mn = 1.4 Bn
16. Similarly number of emails received by age group 21-50 in developing countries on **both** their ids =  $100 \times 30 \times 70\% \times 20\% \times (10+25)$  (total email on both the ids)  $\sim 14$  Bn

17. Number of people in age group 11-20 in under-developed countries =  $100 \times 10 \times 15\%$  Mn (population distribution) = 150 Mn

18. Number of people in age group 11-20 in under-developed countries with internet access =  $150 \text{ Mn} \times 5\%$  (internet penetration) = 7.5 Mn

19. Number of emails received by age group 11-20 in developing countries =  $7.5 \text{ Mn} \times 10$  (per person emails per day) = 75 Mn

20. Similarly number of emails received by age group 21-50 in under-developed countries on **both** their ids =  $100 \times 30 \times 15\% \times 5\% \times (10+25)$  (total email on both the ids)  $\sim 750 \text{ Mn}$

So total number of emails sent/received per day in the world =  $(1.2+12+1.4+14+0.075+0.75) \text{ Bn}$   
 $\sim 30 \text{ Bn}$

Sense check the final answer - does it feel too high or too low? Why don't you google it and tell us what you find and why do you think the difference exists. Which assumption might be causing the difference?

**Q2. Estimate the probability of one dying in train accident in India if the total length of the journey one undertakes is 1500 Kms.**

Type your answer here.

Show/Hide Answer

Following is *one* of the several approaches you can consider -

#### Step 1 - Estimate the number of passenger trains in India

1. Assume 3 major stations in each of the 28 states in India  $\Rightarrow 84$  major stations
2. Assume there is a daily passenger train between each of the major stations  $\Rightarrow {}^{84}C_2 \times 2$  (number of possible combinations of stations  $\times 2$  (one for each way))  $\sim 6,500$  daily trains

#### Step 2 - Estimate number of passengers who commute daily

1. Assume 15 coaches in each train across all classes of travel  $\Rightarrow \sim 100,000$  coaches
2. Number of seats in each coach  $\sim 70$
3. Assumed occupancy ratio  $\sim 70\% \Rightarrow 50$  passengers in each coach
4. Number of passengers who commute daily =  $50 \times 100,000 = 50 \text{ lacs}$

#### Step 3 - Estimate total number of Kms travelled by these passengers annually

1. Assumed average train journey duration  $\sim 12$  Hrs (train journeys usually last between 3 Hrs to 30 Hrs with majority around 10-15 Hrs)
2. Assumed average speed of a train  $\sim 40$  Kms / Hr (including for stoppages)
3. Average total distance travelled by a train =  $12 \times 40 = 480$  Kms
4. Total distance travelled by all the passengers in a year =  $50 \text{ lac} \times 480 \times 365 \sim 90 \text{ Bn man-Kms}$

#### Step 4 - Estimate total number of deaths in railway accidents every year

1. Assume average number of accidents every month (big or small) = 1 (based on what we read in newspapers)
2. Assumed casualties in each accident = 50

3. Annual casualties =  $1 \times 12 \times 50 = 600$

**Final step - Probability of one dying in a train accident in India during a 1500 Kms journey**

1. Number of casualties per man-Kms travelled =  $(600/90\text{Bn})$

2. Probability of one dying during a 1500 Kms journey =  $(600/90\text{Bn}) \times 1500 = 1/100000 = 0.00001$

Sense check the final answer - does it feel too high or too low? It might be difficult to sense check such a small number, you can sense check the numbers at each intermediary step (number of stations, trains, average distance etc.)

Some more practice Guesstimate questions have been given below, give them a try and feel free to write to us if you get stuck somewhere.

**Q3. Estimate number of people answering a guesstimate right now :).**

**Q4. Estimate the number of people flying at this very moment.**

**Q5. Estimate India's daily power consumption in KWh.**

---

(content.php?topic\_id=162&module\_id=10&course=finishing\_school) (content.php?topic\_id=164&module\_id=10&course=finishing\_school)

internshala.com (<http://internshala.com>)

