GUESSTIMATES FACT SHEET & APPROACHES

PREPCOMM IIFT DELHI

POPULATION

- India: 1.3bn
- Lucknow: 3.3mn
- UP: 220mn
- **Delhi: ~ 28mn**
- Mumbai: ~ 21mn

POPULATION GROWTH RATES

- Population growth rate: 1.2%
- Birth Rate: 20/1000 population
- Death Rate: ~7.5/1000 population
- Life Expectancy: ~70 years

RELIGION

- Hindu: 75%
- Muslim: ~15%
- Christian: 6%
- Sikh: ~2%
- Others: ~2%

INCOME BRACKETS

(AS % OF TOTAL POPULATION)

- BPL: 29%
- Low Income: 25%
- Lower Middle: 30%
- Upper Middle: 15%
- High: 1%

AREA

- India: 3.2mn sq. Km
- Lucknow: 2500 sq. Km
- Uttar Pradesh: ~0.25mn sq. Km
- **Delhi: 1500 sq. Km**
- Mumbai: 600 sq. Km

NOTE : READ ABOUT KEY GEOGRAPHY POINTS ABOUT YOUR STATE & NATIVE PLACE

SECTOR-WISE BREAKUP OF GDP

(Based on Ministry of Statistics Report, March 2017)

- Agriculture: 15%
- Industry: 30%
- Services: 55%

OCCUPATION STRUCTURE:

- Agriculture: 50%
- Industry: 20%
- Services: 30%

DEMOGRAPHICS

Rural – Urban Ratio: ~67% - 33%

Literacy Rate (Based on 2011 census)

- India: ~75%
- Youth Literacy Rate (15-24 years): 85%
- Female – Male: 65% - 83%

Age break-up

- <35 years: 65%
- <25 years: 50%
- 0-6 years: 15%
- 7-14 years: 15%
- 15-25 years: 20%
- 25-35 years: 15%
- 35-65 years: 30%
- 65 years +: 5%

OTHER IMPORTANT FACTS ABOUT INDIA

- Car penetration: 20/1000
- Internet penetration: 400Mn
- Mobile Phone penetration: 650Mn
- Smart Phone penetration: 300Mn

CONSUMER/TARGET BASE SEGMENTATION FOR EASIER CALUCATIONS CAN BE DONE BY-

1.Rural-Urban (Geography-wise)
2.Gender Split
3.Age Split
4.Income Split
5.Willingness

METROPOLITAN AREAS	POPULATION	AREA (km^2)
DELHI NCR	28,125,000	3483
MUMBAI	20,800,000	4354
KOLKATA	18,540,000	1851
CHENNAI	13,300,253	1189
BANGLORE	10,576,167	8005
HYDERABAD	9,700,000	7527

SOME OF THE DATA THAT MIGHT COME IN HANDY FOR DIFFERENT TYPES OF GUESSTIMATES

World		
Total Population	7,300,000,000	7.3 billion
Gender		
Male	50%	3.65 billion
Female	50%	3.65 billion
Continents		
Asia	60%	4.3 billion
Africa	15%	1.09 billion
Europe	10%	730 million
Latin America	10%	730 million
North America	5%	365 million
Age Groups		
0-5	10%	730 million
6-14	20%	1.46 billion
15-35	40%	2.9 billion
36-60	20%	1.46 billion
Above 60	10%	730 million
Income Group		
Poor	15%	1.09 billion
Low	55%	4 billion
Middle	15%	1.09 billion
Upper Middle	10%	730 million
High	5%	365 million

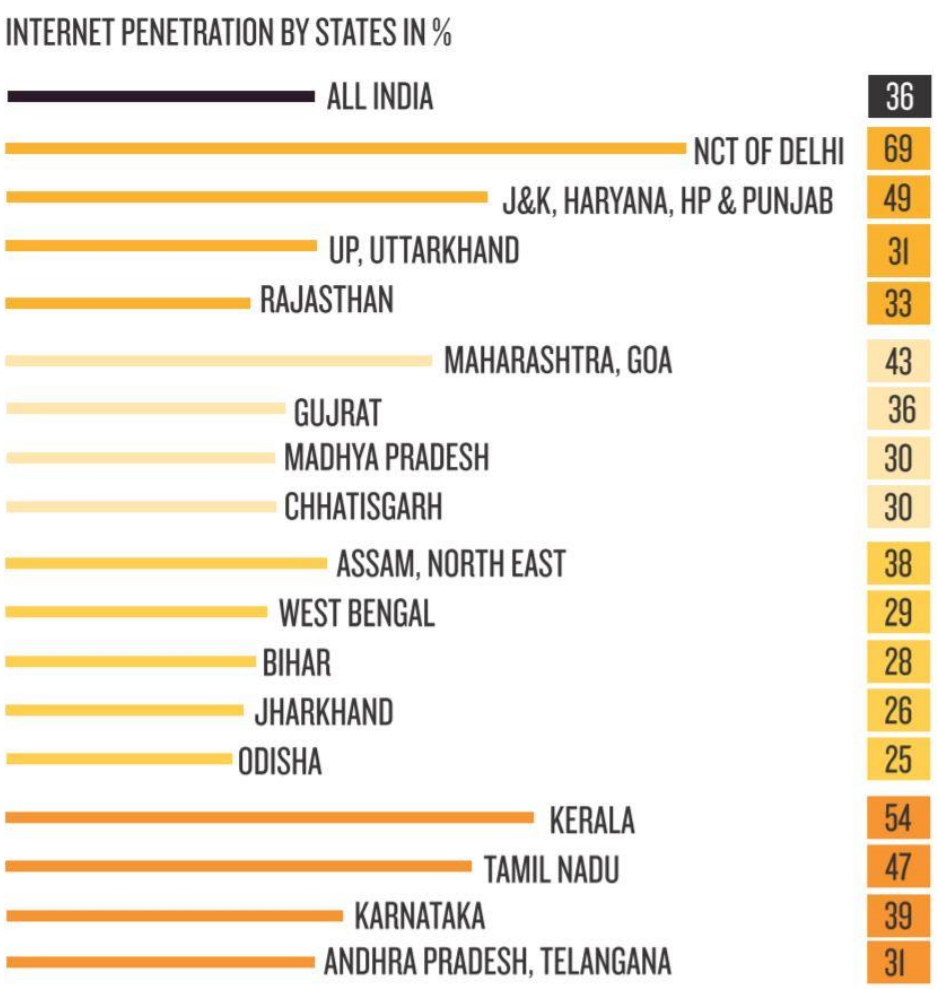
India		
Total Population	1,300,000,000	1.3 billion
Gender		
Male	50%	650 million
Female	50%	650 million
Rural Urban Divide		
Rural	70%	910 million
Urban	30%	390 million
Major Cities		
Delhi	1%	13 million
Mumbai	1%	13 million
Age Group		
0-14	30%	390 million
15-35	40%	520 million
35-60	25%	325 millon
Above 60	5%	65 million
Marital Status		
Married/Others	50%	650 million
Never Married	50%	650 million
Income Group		
Poor	20%	260 million
Low	75%	975 million
Middle	3.50%	45 million
Upper Middle	1%	13 million
High	0.50%	6.5 million

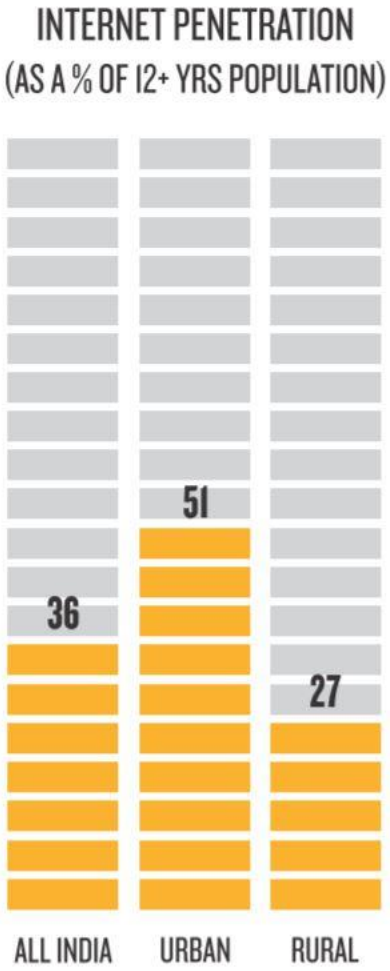
Country/Region	GDP (in trillion $US)	
	World	85,804,391
1	United States	20.580
2	China	14.216
3	Japan	5.749
4	Germany	4.555
5	France	3.081
6	United Kingdom	3.039
7	India	2.972
8	Italy	2.442
9	Brazil	1.847
10	Canada	1.820

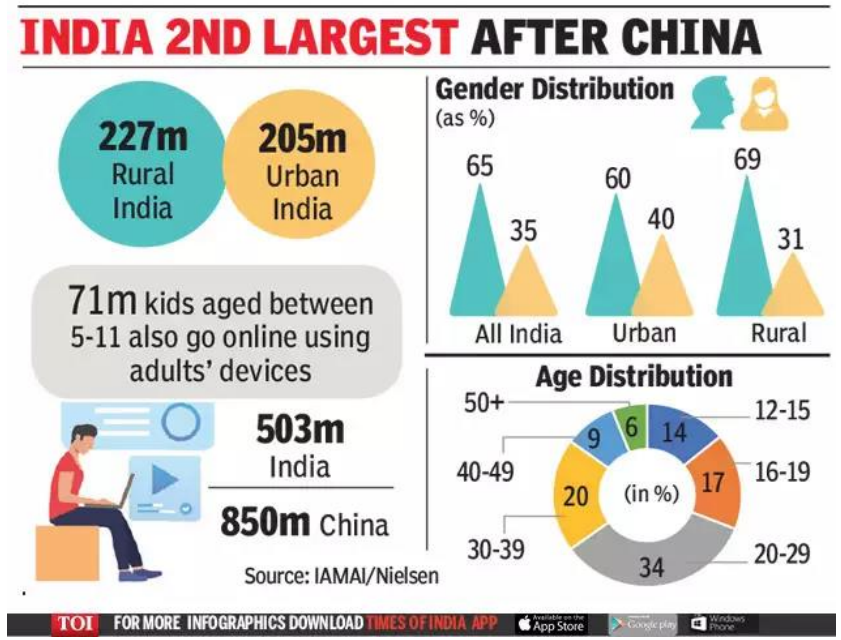
FOR QUESTIONS RELATED TO INTERNET OR MOBILE PENETRATION

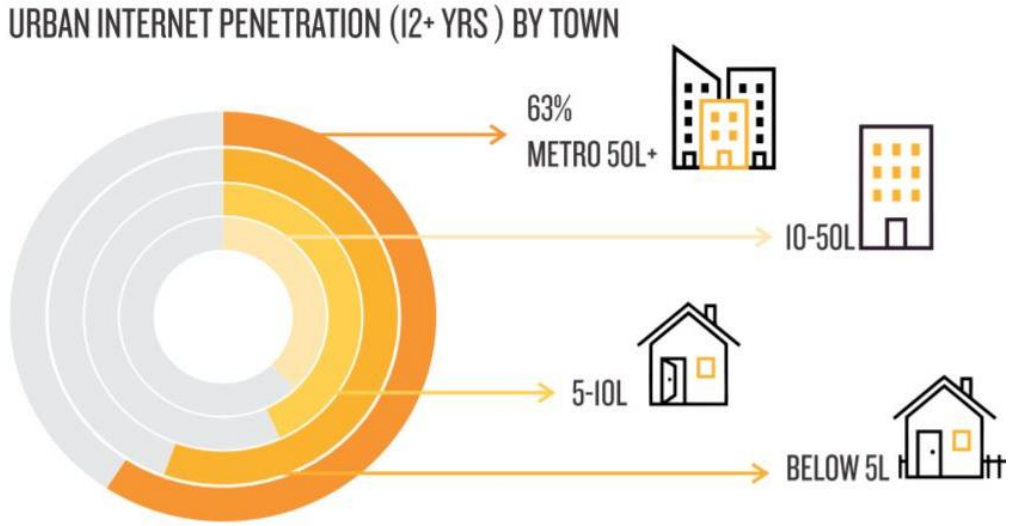
Types of Questions maybe –

1. Number of OTT Subscribers in the country
2. Number of TikTok users in the country
3. Amount of time spent on Mobile by Rural India on WhatsApp









NOTE – For different Interviews you might be asked to carry out a Guesstimate related to the area of functioning of the firm.
EG:

- Axis Bank or ICICI Bank might ask you to approximately find the number of credit card users in the country;
- An FMCG company like GCPL/ NESTLE/ ITC might ask you to answer an approximate number of users in any of its single product or a GTM strategy based on your answers
- General Guesstimate questions to check your understanding or analytical skills

There is rarely, if ever, a verifiably correct answer or one way to tackle a Guesstimate question. The goal is to make reasonable, logical assumptions and if you are wrong on your assumptions, that is totally fine—after all, some of the figures used to make the estimation are quite obscure and you do not have access to the data during the interview. The interviewer is aware of that.
If you can logically explain how you arrived at your assumptions, and highlight which of your assumptions seem the most important to research, you're doing well.

Virtually all of these questions can be grouped into Top-Down or Bottom-Up (often referred to as Ground-Up) questions. In some situations, they can even be both -

Top-Down Questions: Questions that involve starting with an entire population (in other words, the "top" level) and then breaking it down until you arrive at an answer.

For example, consider the question about the number of schoolteachers in Chicago. A simple way to approach it would be to start with the population of Chicago, then estimate what percentage of the population is of student age, and then estimate the number of students per class. Using this, you would arrive at an estimate of the number of school teachers, because at any given time there is (generally) exactly one teacher per class. To show your ability to be creative and think outside the box, you could also attempt to account for retired teachers and substitute teachers.

Bottom-Up (Ground-Up) Questions: For these questions, rather than starting from the "top" with a high-level figure such as population, the best approach is to start from the "bottom"—some low-level statistic, such as Revenue per customer, and build your way up to the answer.

For example, consider the question pertaining to the monthly revenue of a hair salon. In this case, we'd recommend you work out the revenue for a week and then multiply that by four (or if you are quick at multiplication, 4.3). You could start with an assumption regarding the average price per client visit, and then estimate weekly volume by assuming the number of chairs in the salon, the number of hours it is open per week, and the average number of clients chair per hour. To show your ability to be creative and think outside the box, you could also add revenue for hair salon products sold. You may also want to break the estimate into male and female clients, as male clients at hair salons tend to spend less money per visit but also take less time on average.

STEP-BY-STEP APPROACH TO SOLVING GUESSTIMATES

1. The most important part of a Guesstimate is understanding the question or assumptions that you can take. Ask questions if the case isn't clear.
Ask questions if the request is not totally clear. Take a minute or two to decide how to structure your answer—this is the period in which you determine whether it is Bottom-Up or Top-Down question, how you will break the question down into pieces, and the assumed values you will use for each of those pieces. Though you can interact and direct questions to your interviewer, in these cases it is not useful to ask for help on your assumed values as often his or her guess will be an educated guess, just like your own guess.

2. Mentally double-check the "Guesstimated" values that you will apply to the pieces of the calculation you developed in the first step. Note that in Guesstimate Cases, a population figure is very commonly part of the solution process If required or specified by the Interviewers you can specify the assumptions or approach that you're using in the case & work them through the solution you're working towards.

3. Perform the calculations to arrive at an answer. Remember to use estimation to make your math easy. Also, if you find that you are estimating multiple figures to make the math easier, try to balance "rounding up" with "rounding down." For example, if an answer involves multiplying 44 by 5,300, you will get a more accurate answer with 50 × 5,000 = 250,000

4. Identify any additional creative elements that could further refine your answer, if relevant. , you should tell the interviewer which pieces of your estimate seem most vital to research further—those that seem to have the highest degree of sensitivity in determining the correct answer, or those in which you have the most uncertainty as to whether your estimate was reasonably close

STRATEGIES TO SOLVE A GUESSTIMATE:

1. **Pareto Principle (80:20 Rule):** - The Pareto principle states that, for many events, roughly 80% of the effects come from 20% of the causes. The idea behind this strategy is to split what we are calculating in terms of majority and minority. The basic idea is to calculate the major portion first, side-line the minority, and compute it later.
2. **Process Mapping:** It is about deciding whether to use the push or pull approach.

For Example: Find the amount of chocolate used in India in a day.
We can have 2 approaches for the same.
Consumption side: Estimating the number of end consumers (to avoid double-counting) and the units consumed by each consumer.
Production side: Estimating the amount of cocoa produced, chocolate factories in a city and extrapolating it by appropriating the share based on the population of the country.
3. **Layout and then fill the numbers:** Prepare a comprehensive exhaustive layout for the guesstimate and then start filling in the numbers.
4. **MECE (Mutually Exclusive and Collectively Exhaustive):** Ensure that the buckets do not overlap with each other and are comprehensive when taken together.

TYPES OF GUESSTIMATES BASED ON APPROACH TO THE SOLUTION:

1. **Household Approach:** The category let's say, Cars are bought as a household purchase and hence we calculate the number of cars as per the number of households.
2. **Population Approach:** Example: A category like a pen is bought for individual consumption and is based on the number of people. Hence, we proceed with the guesstimate about the number of people.
3. **Structural Approach:** Example: To find the number of airplanes landing in India in a single day, the bottleneck would be the runway as it controls the entire operation

STEP-BY-STEP APPROACH TO SOLVING GUESSTIMATES

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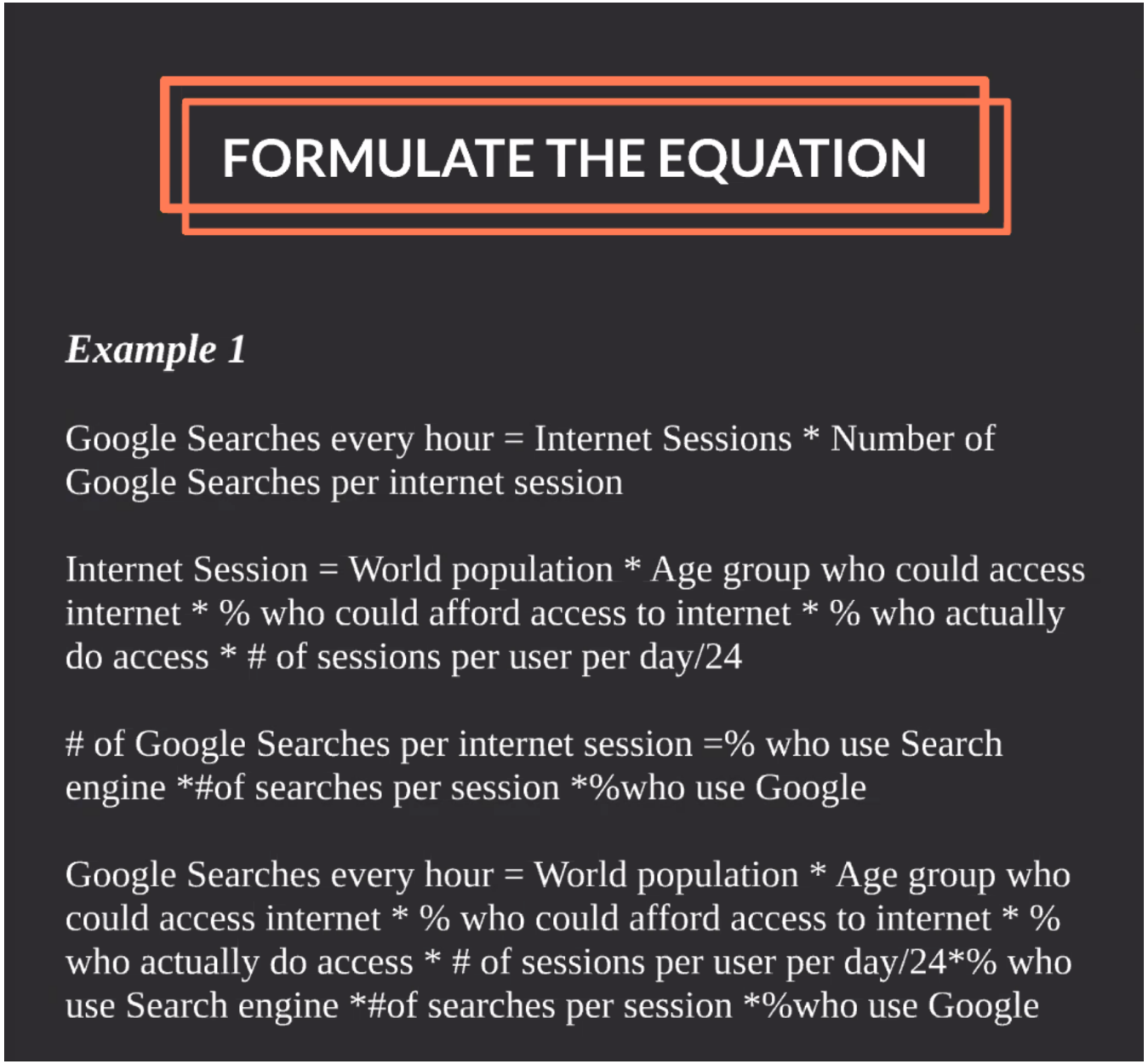
Question: No of Google searches every hour

Scope: No of Google searches on google search engine only

Approach: Demand side (as in number of people wanting to do a google search)

Supply side here would be determined by trying to estimate ability of Google servers to process searches per hour



STEP-BY-STEP APPROACH TO SOLVING GUESSTIMATES

STATE THE ASSUMPTIONS

Example 1

World pop : 7 bn

Age group : 20-60 = 40/70 (Life expectancy : 70 yrs)

Could afford access to internet : 50% (Developed, Developing + Cheap Mobile data rates)

Who actually access internet : 75% (Eg: Mother)

Internet Sessions per day : 4 (Power users, passive users)

% who Search something using search engine : 50% (Only for chat - WhatsApp, etc)

# of Searches per session : 1.5

% who use Google : 70% (Market share, factoring China)

STEP-BY-STEP APPROACH TO SOLVING GUESSTIMATES

CALCULATIONS

Example 1

Google Searches every hour = World population * %Age group who could access internet * % who could afford access to internet * % who actually do access * # of sessions per user per day/24*% who use Search engine *#of searches per session *%who use Google

Google Searches every hour =
7 bn*40/70*50%*70%*4/24*50%*1.5*70%

Google Searches every hour = 0.131 bn

HOW MANY CUPS OF COFFEE WERE CONSUMED IN THE UNITED STATES IN THE PAST WEEK?

1. Number of cups in the past week – We are considering consumption of coffee to be a daily affair and therefore on an average the consumption patterns do not change over days.
2. Percent of population that drinks coffee – Assuming USA's population as 300Mn and 20% of the population below the age of 12 who do not consume any coffee. We can also consider a population of 20% who do not consume any coffee but consume other beverages
3. Number of cups per day: here our guess is that of the remaining 60% of people, half drink 2 cups per day, a quarter drink 4 cups per day, and a quarter drink 1 cup per day
$2 \times 0.5 + 4 \times 0.25 + 1 \times 0.25 = 2.25$ cups per coffee drinker per day for the 60% of USA's population
4. Total number of cups of Coffee for USA's Population = $60\% \times 2.25 \times 300{,}000{,}000 = 405$ million cups each day
Total cups per week = 405 million cups × 7 days per week = 2.84 billion cups per week

WHAT IS THE REVENUE OF PEUGEOTS SOLD IN FRANCE PER YEAR?

(NOTE : PEUGEOT is the highest selling car brand in France. Similar approach can be applied to MARUTI in India or Toyota in Japan)

There are 3 major variables in this particular problem – Population, Geography based division and a replacement rate of a long term investment (cars)

Population of France: Approximately 60 million people.
Assume an **average household** is **3 people**. This leads to 20 million households (60 million ÷ 3).
Assume 20% of households have no car, as they are in urban cities such as Paris or Lyon. (On the assumption that owning a car in Urban cities is difficult and costly)

Of the remaining households, assume an average of 1.5 cars per household.
Therefore, there are approximately **80% × 1.5 × 20 million households = 24 million cars in France**.
Assuming a **replacement rate of every 6 years**, there will be (24 ÷ 6) **= 4 million cars replaced per year**.
Of these 4 million, how many are Peugeot brand? You could suggest that the French are quite patriotic, so perhaps 20% of the 4 million cars purchased each year are Peugeot.(Or point to the fact that Peugeot Cars are the highest selling car.

Therefore, you estimate that (20 × 4 million) = 800,000 Peugeot cars are purchased in France per year.
Of the 800,000, assume 70% are new cars and 30% are used cars.
Assume that the average price is $30,000 for new cars, and **used is $10,000 for used cars** (this is assuming similar pricing, currency-adjusted, to that of U.S. cars by adjusting Euro with USD).
Using these assumptions, (560,000 × $30,000) + (240,000 × $10,000) = $16.8 Billion + $2.4 Billion = $19.2 Billion.
Therefore, total **Revenue of Peugeot cars sold in France per year is approximately $20 Billion**.

HOW MANY ELECTRIC POWER DOES ONE INDIAN FAMILY USE?

For this particular question we've to start with Top-Down Approach.
We can start with our Electricity bills to estimate the total electric energy we use in a month.
The Per Capita Income per Month in India is about Rs 11,000
Considering the 65-35 split of Rural & Urban population, the average Electricity Bill will be inclined towards the lower end of the spectrum. Assuming Rs 3000.
The average price of electricity per kilowatt hour is about Rs 5

Or, we use about Rs 3000 / Rs 5 = 600 kilowatt hour each month.
There are 24 hours in a day with 30 days per month -
Or, 700 hours per month
Or, electric power used in a month will be 600 kW / 700 = 0.85 kW.
This means an average Indian household uses an average of **0.85 kW** of electric power

HOW MANY CIGARETTES ARE CONSUMED IN INDIA IN A MONTH

Key Considerations for finding out the number of Cigarettes consumed in India in a month

(i) Geographic filter is most prevalent as life style choices as well as availability depends on Geography
(ii) For simplification we've considered the divide as 70:30, we're using those weightages to divide India's population of nearly 1.3 Billion
(iii) Typically, the male population consumes more cigarettes than the female population in both the rural and the urban landscape. This assumption is backed by our everyday observations.
(iv) Smoking is more prevalent among the older age and the bulk of the population starts smoking while they start working.

Population: 1.3 Billion (100%)								
Segment I	Age above 18 years (eligible to smoke): 70%				Age less than 18 years: 30%			
Segment II	Urban: 70%*0.3 21%		Rural: 70%*0.7 49%		Urban: 30%*0.3 9%		Rural: 30%*0.7 21%	
Segment III	Male 15%	Female 6%	Male 35%	Female 14%	Male 6%	Female 3%	Male 15%	Female 6%
Average cigarettes per month	1.32	1.08	3	1.80	1.80	1.80	4.80	3.60
Total cigarettes	7.2 Trillion							

HOW MANY AIRPLANES DO INDIANS TAKE IN ONE YEAR?

Let's break this problem into two parts :
- How many Indians are there
- How many flights do each of them take

In 2020, there are 1.38 * 10^9 Indians on the planet.
The average Indian earns about ₹ 32,000 per month. Average annual tickets are around
₹ 6000. It is safe to assume, then, that most of them can travel once per year i.e - 2 flights.
Only a small percentage travel more than once per year or more than 4 flights.

The total number of flights can be assumed to be between 2 and 4 or, 3 per Indian.
Thus, the total number of flights can be 3 * 1.38 * 10^9
Or, Or, 4.14 * 10^9 flights (4140 million)
Our answer is off by the actual answer with about a factor of 10
The actual number of flights taken by Indians is ***344 million*** (or 3.44 * 10^8).

ALL THE BEST.