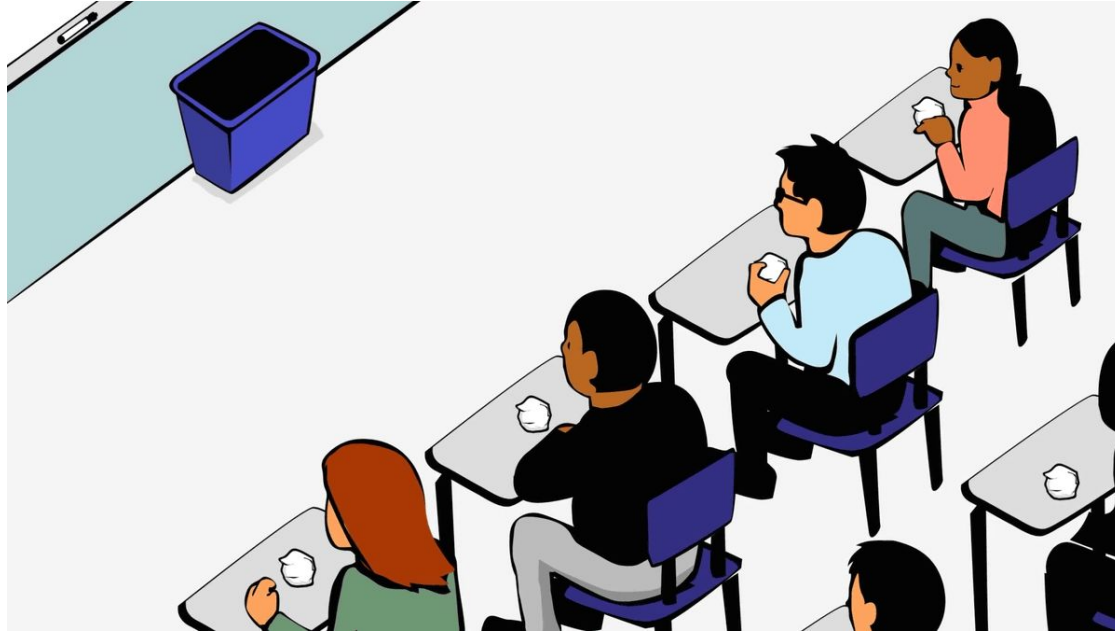# CS for Social Good

Kameswari Chebrolu

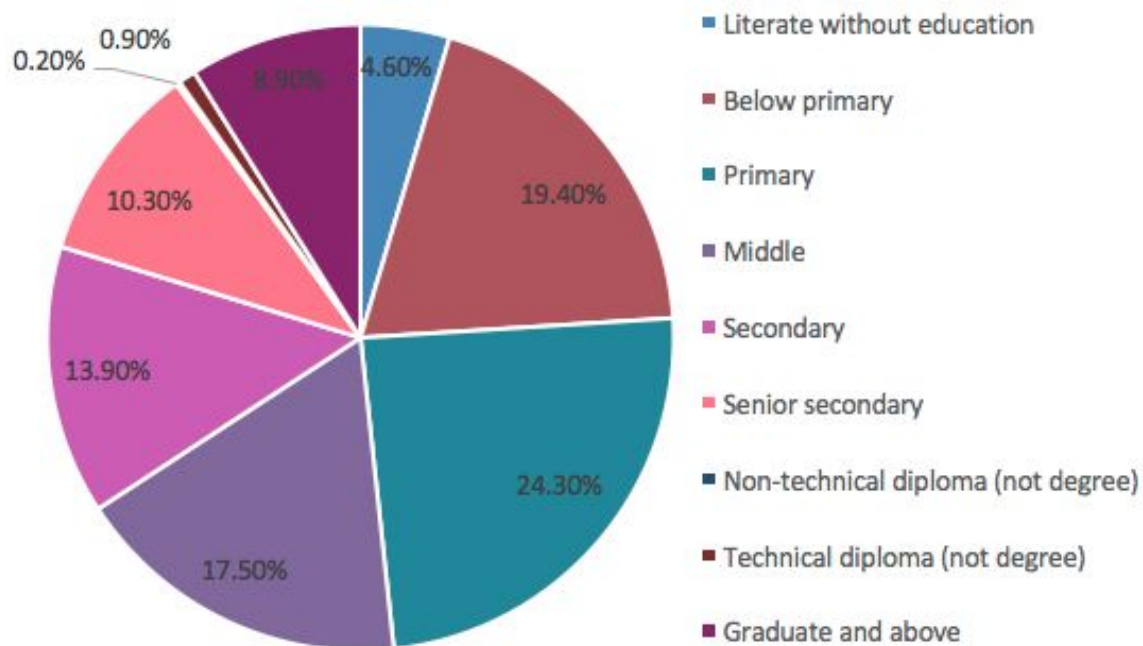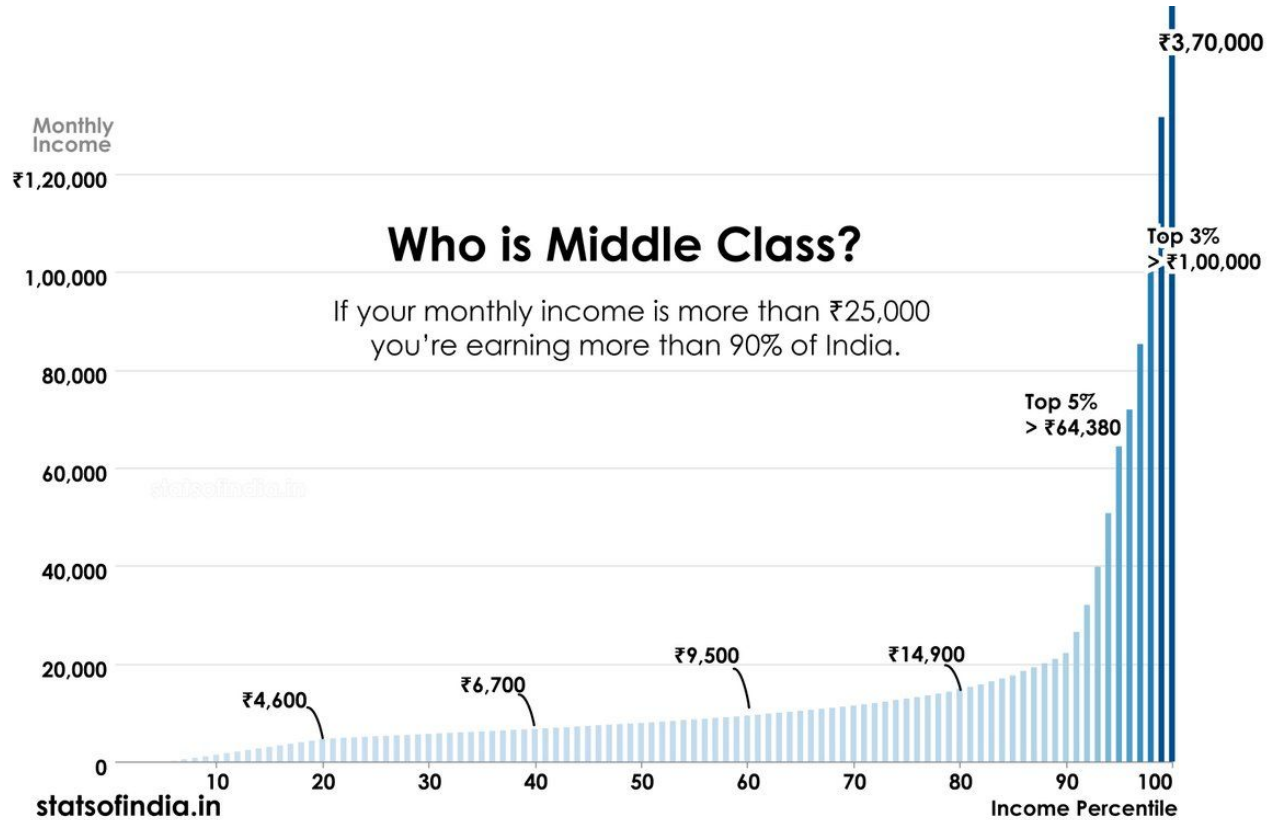(Images taken from the web, not self created)

Experiment

Questions?

- What did you notice about who was successful and who was not?
- Did everyone have the same opportunity to be successful?
- Who was more likely to notice it was unfair – the front row or back row?
- What are some privileges certain people may have been born into that make it easier for them to be more wealthy and successful than other people?
- What situations might someone be born into that would make it more difficult for them to be successful?
- What is one privilege we all share?
- What should we do about this?

Education

Educational levels for literate population

- Literate without education
- Below primary
- Primary
- Middle
- Secondary
- Senior secondary
- Non-technical diploma (not degree)
- Technical diploma (not degree)
- Graduate and above

4.60%
19.40%
24.30%
17.50%
13.90%
10.30%
0.20%
0.90%
8.90%

Wealth

CS Streams

- Theoretical
  - Algorithms, Combinatorics, Complexity theory, Graph theory, Formal methods etc
- Computing Systems
  - **Network**, OS, Compilers, Databases, Security etc
- Intelligent Systems
  - ML, AI, Vision, NLP, Image Processing, Graphics etc

Networks

- Communication: Email, Chat, Voice/Video
- Entertainment: Online gaming, Videos (Youtube), Blogs, Social networks (Facebook, twitter)
- Education: Wikis, News, MOOCs (Coursera, edX)
- Finance/Commerce: Online shopping (Amazon, ebay), Banking

Research

- Extract more bandwidth, decrease delays, decrease losses
  - Optimize above based on cost and energy
- Fancy Research:
  - IoT: fridge detects missing items and orders from grocery shop
  - Vehicular communication (prevent accidents)

Socially relevant research

- Rural Internet via WiFi (Kameswari)
- WWH (Kameswari)
  - Human assisted Information access via regular phones

Intelligent Systems

- Social Networking
  - Suggest followers, Content recommendation
- E-commerce
  - Product suggestion, product matching
- Smart Assistants
  - Alexa/Siri (speech); Maps, Translation
- Photos
  - Face detection, surveillance
- Self Driving cars
- Chatgpt

Socially relevant Research

- Automatic speech assessment in English (Preethi Rao, EE)
- Auto-translation of English textbooks into local languages (Ganesh)
- Speech to text: archiving rural voices (Preethi Jyothi)
- Ticket Management (Municipality complaints)
- Telemedicine (Ganesh, Sunita)

Theory

- P = NP?
- Factorization of primes
- Matrix multiplication
- Shortest path
- Code doing what it is supposed to do

Socially relevant research

- Jal Tantra (Om, Milind)
- Train schedule (Shivaram)

India's problems

- Health
- Law and Order
- e-Governance

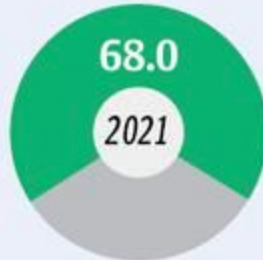# India still grapples with a shortage of medical staff

Category of medical staff

Per cent of vacancies

Doctors in rural primary health centres

17.5 2005

21.8 2021

Specialists in rural community health centres

46.7 2005

68.0 2021

Auxiliary nursing midwives at PHCs and sub-centres in rural areas

2005 4.7

2021 27.2

JUSTICE DELAYED, DENIED

Almost a quarter of the sanctioned positions remain vacant in subordinate courts which are thronged by poor litigants

Supreme Court	High Courts	District & Sub Courts
Sanctioned Strength	Sanctioned Strength	Sanctioned Strength
31	1,079	21,017
Current Strength	Current Strength	Current Strength
26	615	16,851
Vacancies	**Vacancies**	**Vacancies**
5	**464**	**4,166**
Backlog	Backlog	Backlog
60,000	38,91,076	2,30,79,723

Top five Indian states with highest backlog of cases

State	Cases pending at district courts	Judges at district courts	Judges per/mn people
UTTAR PRADESH	53,63,613	2,068	10
MAHARASHTRA	31,54,681	2,353	21
GUJARAT	21,98,280	1,205	20
BIHAR	14,33,511	1,361	13
WEST BENGAL	13,42,122	744	8

In other countries

■ Judges per million population

Country	Judges per million
France	124
USA	108
Australia	40
Canada	33
England	22
India	17

Source: 2010 Comparative Litigation Rates by J Mark Ramseyer & Eric B Rasmusen of Harvard Law School

Summary

- Be mindful of your privilege
  - Think of those behind you
- Developed world problems: many are there to solve
  - We need to solve our problems!!!
- How can you contribute?
  - In position of power, design policies that cater to bottom of pyramid
  - Contribute some money/time (e.g. to others solving such problems)
  - Solve problems yourselves!!!