Sampling Techniques

Why Sampling?

- Gathering information about an entire population often costs too much or is virtually impossible.

- Instead, we use a sample of the population.

- How to form a sample?

Principal

- A sample should have the same characteristics as the population it is representing.

Hypothesiss

Students in our class (Math201) like Basketball more than Football.

Population: 36 students in our class.

Sample:

Multiple ways to Sample

- Simple Random Sampling

- Systematic Sampling

- Stratify Sampling

- Convenience Sampling (Not recommended!)

(For example : only collect data from your friends)

Simple Random Sampling

Simple Random Sampling

- Step 1: Number all items in the population

- Step 2: Decide the sample size

- Step 3: Use a random number generator to select items/data for the sample

Randomly select 10

8 don't support the hypothesis

2 do support the hypothesis

$\Rightarrow$ If "looks" like the hypothesis is not correct.

Population

	First Name	Last Name	Attendance	Assignments	
1	James	Anelli	18	Julia	Lau
2	Dante	Brito	19	Sarah	Lavoie
3	Dylan	Castle	20	Gregory	Leedham
4	Julia	Dearing	21	Donald	MacMillan
5	Reid	Deniso	22	Daniel	Maki
6	Anna	Dye	23	Aiden	Masse
7	Lynsey	Fleming	24	Nickolas	Molina
8	Ryley	George	25	Vincent	Pesce
9	Nicholas	Giogas	26	Seth	Pickering
10	Spencer	Glau	27	Caleb	Raesly
11	Emma	Glynn	28	Elijah	Rocheleau
12	Matthew	Grace	29	Brianne	Salomao
13	Aiden	Guarneri	30	Juan	Sanchez Mercedes
14	Michael	Gudewicz	31	Aleksandr	Shekhel
15	Jessica	Jaffarian	32	John	Stellakis
16	Roie	Lachmish	33	Cade	Sullivan
17	Connor	Larochelle	34	Robert	Thompson
			35	Jackson	Williams

- Let say we want to go with a sample size of 30% population.

- We would need about 35*.3 = 10 or 11 data points.

- Use a random number generator to generate a random number, for example

  Link

- Collect data from the students associated with the generated numbers.

Systematic Sampling

- Step 1: Number all items in the population

- Step 2: Pick a random number, says 7, then select items starting from 7, 8, 9...to a desired number.

Stratified Sampling

- Breaks down the population into groups

- Randomly select items from each groups

- The proportion of each group in your samples and the proportion of each group in your population should be similar.

35 of us

Female
9 ≈ 26%
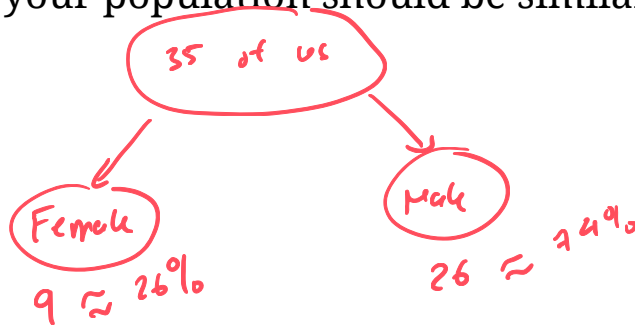
Male
26 ≈ 74%

we may pick about 10 × 26% = 2.6 ≈ 3 (female) for our sample. (we inted to have the sample size of 10)

Convenience Sampling (Not recommended!)

- Conveniently select items from the population

- For example: Only collect data from the people you know