TYPES OF INFERENCES

~~1. IDENTIFYING THE POPULATION MEAN~~

2. IDENTIFYING THE POPULATION %

3. VERIFYING WHETHER THE POPULATION MEAN IS EQUAL TO A CERTAIN VALUE

4. VERIFYING WHETHER THE POPULATION % IS EQUAL TO A CERTAIN VALUE

5. VERIFYING WHETHER 2 POPULATION MEANS ARE DIFFERENT

6. VERIFYING WHETHER 2 POPULATION % ARE DIFFERENT

2. IDENTIFYING THE POPULATION %

CASE STUDY: ELECTION POLLING

MR. T IS A PRESIDENTIAL CANDIDATE

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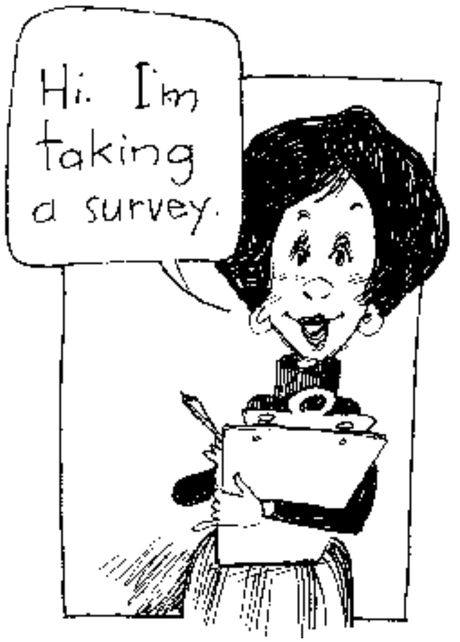
HE HIRES A **POLLSTER**
TO FIND OUT HIS
CHANCES OF WINNING



THERE ARE 230 MILLION
VOTERS IN THE COUNTRY

THERE ARE 230 MILLION VOTERS IN THE COUNTRY

THE POLLSTER CAN'T GO AROUND ASKING EVERY ONE OF THEM WHETHER THEY'LL VOTE FOR MR. T

STEP : 1

THE POLLSTER PICKS A SAMPLE OF 2,000 VOTERS

STEP : 2

CALCULATE THE SAMPLE STATISTICS

SAMPLE % = % OF VOTERS IN THE SAMPLE WHO FAVOR MR. T = $\frac{1100}{2000}$

= 55%

STEP : 2

CALCULATE THE SAMPLE STATISTICS

SAMPLE % =55%

$$\text{SAMPLE SD} = \sqrt{\frac{p\,(1-p)}{n}} = \sqrt{\frac{55\% * 45\%}{2000}}$$

= 0.01

STEP : 2

CALCULATE THE SAMPLE STATISTICS

SAMPLE % =55%

SAMPLE SD = 0.01

STANDARD ERROR = SAMPLE SD = 0.01

= 1 % PT

STEP : 2

CALCULATE THE SAMPLE STATISTICS

SAMPLE % = 55%

SAMPLE SD = 0.01

STANDARD ERROR = 0.01

SAMPLE % = 55%

"YAY, I WIN"

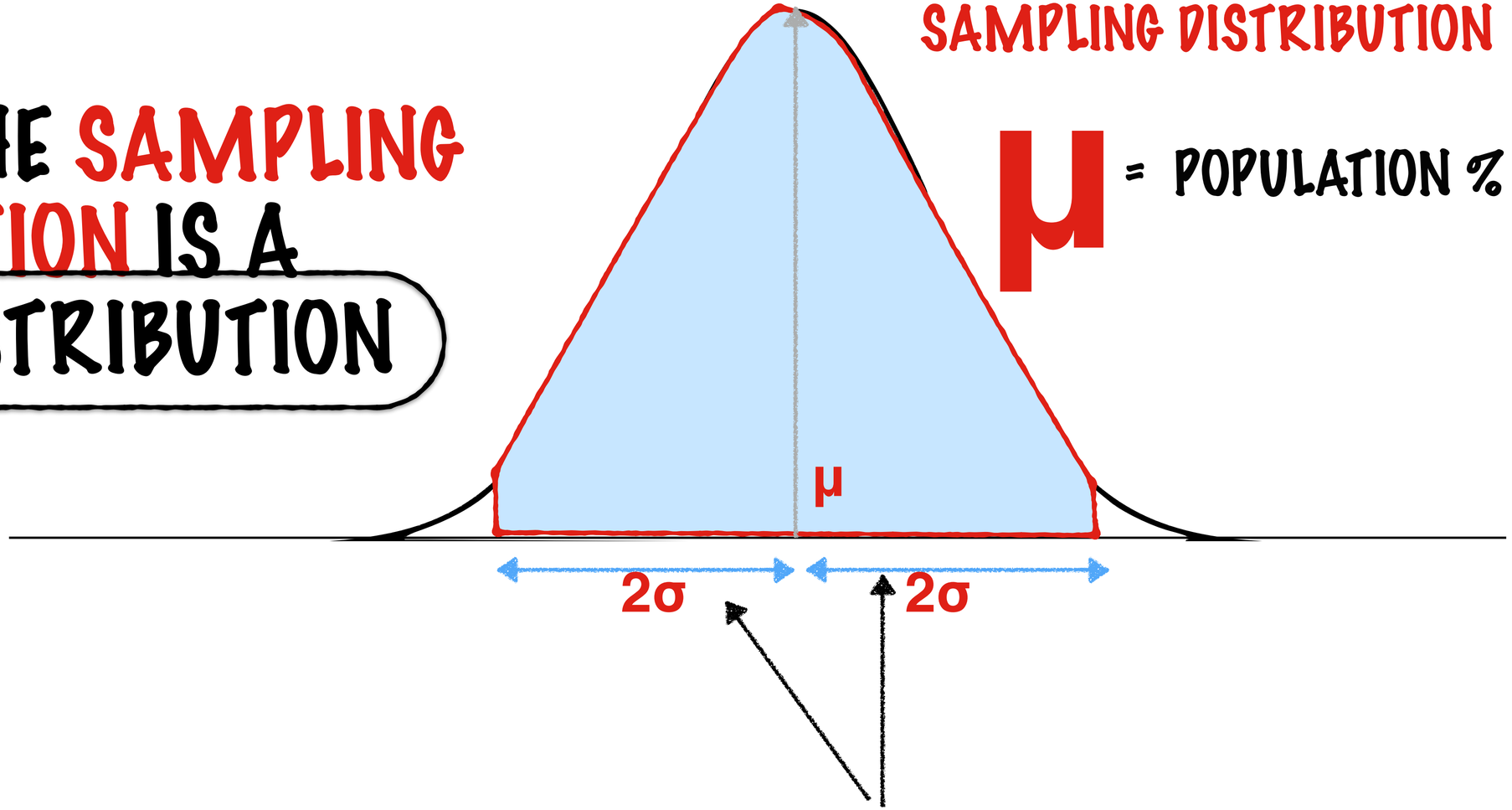
"BUT WAIT, THAT'S JUST THE % FROM THE SAMPLE"

WELL THEN, WHAT'S THE % OF THE POPULATION?

STEP : 3

ESTIMATE THE DIFFERENCE BETWEEN SAMPLE MEAN AND POPULATION MEAN

REMEMBER THE SAMPLING DISTRIBUTION IS A NORMAL DISTRIBUTION



95% PROBABILITY THAT THE SAMPLE MEAN LIES HERE

95% PROBABILITY THAT

SAMPLE MEAN LIES BETWEEN

$\mu - 2\sigma$, $\mu + 2\sigma$

95% PROBABILITY THAT 55% LIES BETWEEN

$$\mu - 2\sigma, \mu + 2\sigma$$

σ = STANDARD ERROR
= 1 % PT

95% PROBABILITY THAT
55% LIES BETWEEN
$\mu - 2 , \mu + 2$

THE POLLSTER CAN SAY TO MR. T

"55% OF THE PEOPLE FAVOR YOU, AND I HAVE 95% CONFIDENCE THAT THIS NUMBER IS OFF BY AT MOST 2% POINTS"

THE POLLSTER CAN SAY TO MR. T

"55% OF THE PEOPLE FAVOR YOU, AND I HAVE 95% CONFIDENCE THAT THIS NUMBER IS OFF BY AT MOST 2% POINTS"

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