

Normal Probability Distribution



Height (Vertical axis) gives...

Horizontal axis gives values of ...

Total area under the curve =

Parameters

The Normal is a two **parameter** probability distribution

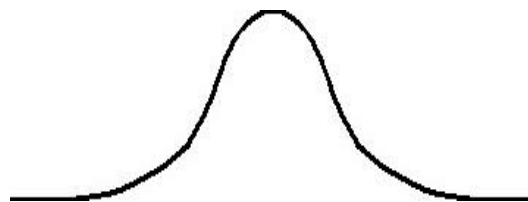
μ and σ are called the....

Mean = μ

This measures where the center...

Standard deviation = σ

Inflection Points



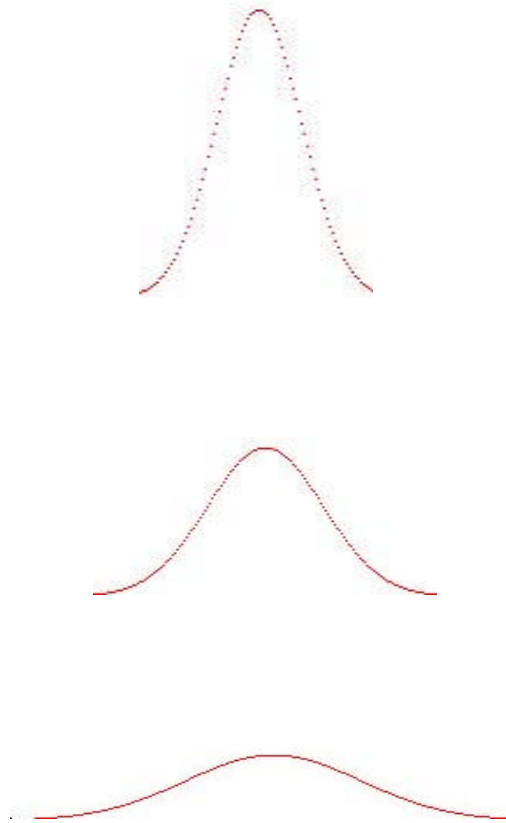
σ measures **spread**



For $\mu = 200$ and $\sigma = 25$, what score is 1σ above μ ?

For $\mu = 200$ and $\sigma = 25$, what score is 1σ below μ ?

What are the effects of changing σ ?



As σ increases....

Notation: $N(\mu, \sigma)$

Normal as a model for DV's

Abduction:

Process in nature:

A person

Measurement Operation:

An IQ test reduces person
to a single number

Normal Distribution

$N(100, 15)$



Called a Population

Sampling from Normal Populations

Achievement Test Example

Process in nature:

A child

Measurement Operation:

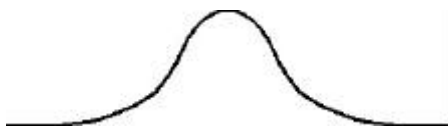
An Achievement Test

Normal Population

$N(200, 10)$



Sampling from a Population



$n = 10$

[]

Population Parameters versus sample statistics



$n = 10$ [] Mean =

StatCenter's Sample from Normal Tool

Sample Normal

Enter Population Parameters

Enter Mu:

Enter Sigma:

Enter Sample Size:

1: Create a normally distributed population by entering mu and sigma.

2: Specify a sample size between 1 and 10.

3: The program will give you a random sample of size n.

199.462
210.518
191.194
184.049
190.963
197.693
201.127
209.858
215.176
211.405

M: 201.144
S: 9.877

Areas Under Normal Curves

Area between two values

Process in nature:

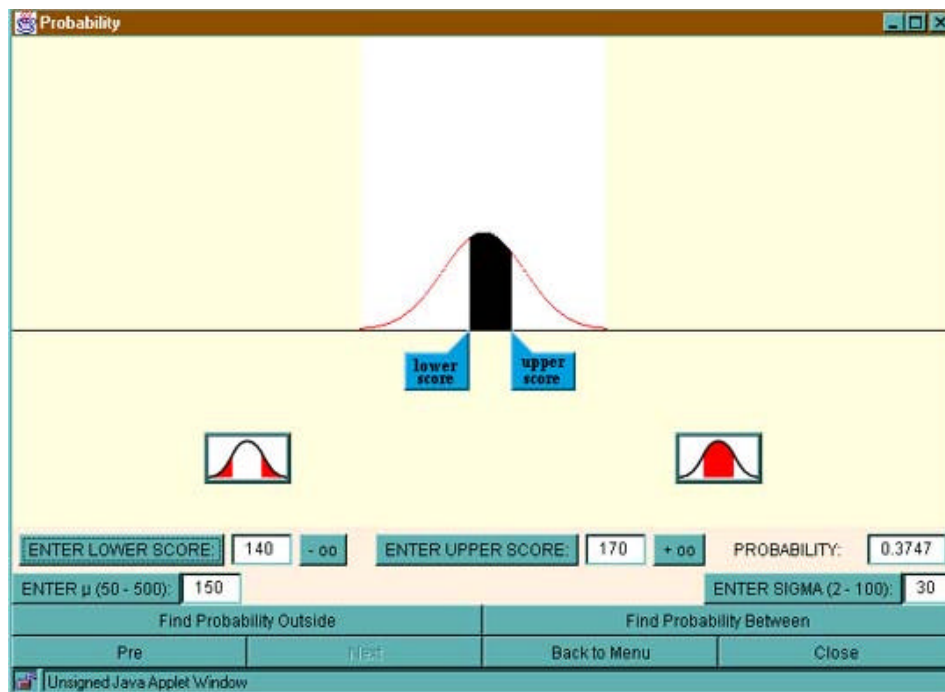
Measurement Operation:
DV

Random Variable
Normal Distribution

StatCenter's Normal Tool

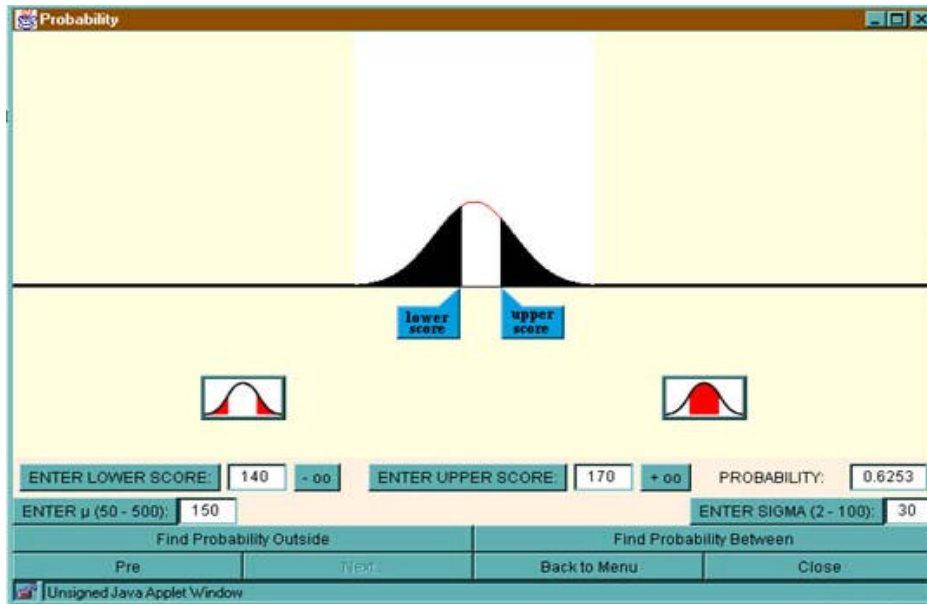
Sample one man from population

What is the probability that...



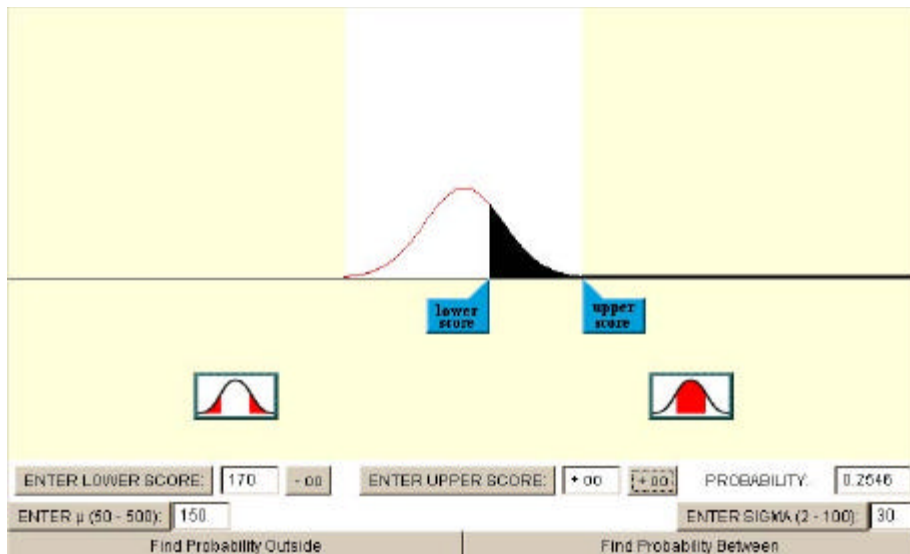
Sample one man from population

What is the probability that...



Sample one man from population

What is the probability that...

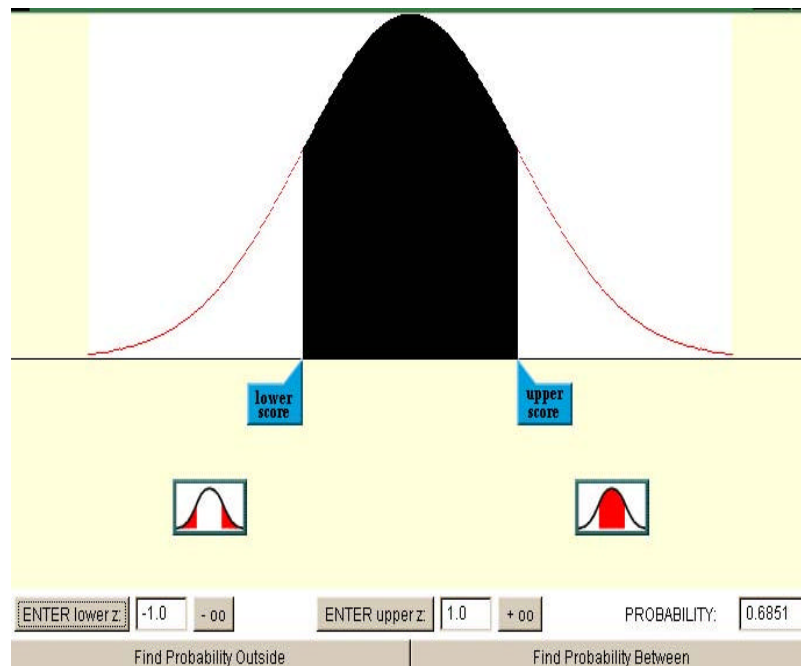


Unit Normal (Z Distribution)

Definition

Textbook tables

StatCenter's Unit Normal Tool



Converting from $N(\mu, \sigma)$ to $N(0,1)$ **Height Example:**

Suppose a man has height of 135 cm

Raw score

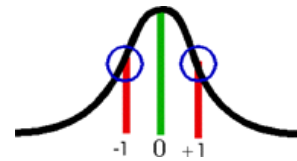
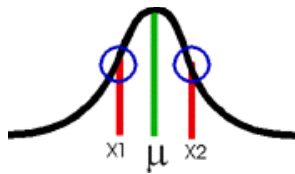
$$X =$$

Find the z score for a raw score of 135

$$Z =$$

Review: Inflection points, σ , and the z score conversion

Example: $N(270,20)$



What score has .05 above it?

Sample one man

Find the height (in cm) above which there is only a .05 probability of randomly sampling a man's height. [This like the alpha level we will use later with statistical tools.]

