AP Stat   Inference Practice Matched Pairs   Name _____

Ch 12.1 Hypothesis Tests for Means

Sometimes an inference method (either confidence interval or hypothesis testing) uses **two-pieces of data** to obtain **one sample**. This t-test compares one set of measurements with a second set of measurements. The **mean** is calculated from the **difference** in the two-pieces of data. This type of problem is often referred to as "**Matched Pairs**". This matching can be achieved by

   I.   taking two measurements from the same subject.

   II.   using naturally occurring pairs such as twins, or husbands and wives.

   III. matching subjects by some observable characteristic such as age.

Ex: If you examine the fingers of your left hand you will see that the "ring finger" is often a little longer than the "index finger". We took a simple random sample of adult females and measured the length of both fingers on their left hand. The results (cm) are in the table below. Assuming the distribution of finger lengths is normal, is there **significant evidence** to conclude that the ring finger will be **longer** than the index finger on an adult female's left hand?

Subject	Ring Finger	Index Finger	Difference
1	9.6	8.9	
2	10.7	10.5	
3	10.2	9.3	
4	9.5	9.5	
5	9.7	8.9	
6	9.5	8.9	
7	9.7	9.0	
8	11.0	10.1	
9	9.3	9.2	
10	9.8	9.5	

Ring Finger   Index Finger
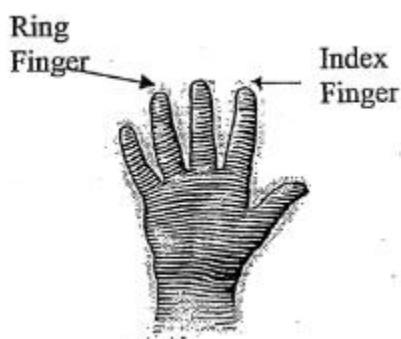
- **State:**

   H_0: the true mean _____ in length of ring finger and index finger on an adult female's

       left hand is _____

   H_a: the true mean _____ in length of ring finger and index finger on an adult female's

       left hand is _____

   H_0: μ_{diff} = _____

   H_a: μ_{diff} _____

- **Plan:**

   μ_{diff} = the true mean _____ in length of ring finger and index finger on an adult

   female's left hand

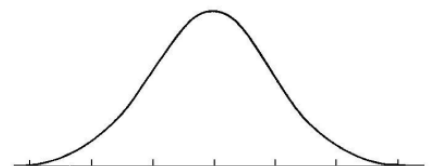   _____ sample _____ test for _____

- Conditions:

   Randomness ---

   Independence ---

   Large Counts ---

   Calculations:

   n = _____   df = _____ $\bar{x}$ = _____   se = _____   a = _____

   P(_____) =

- Conclusion:

   Since the p-value of _____ is _____ than the significance level a = _____,

   we have evidence to _____ the null hypothesis. We can **possibly** conclude that the

   _____ in length of the ring finger and the length of the index finger on

   an adult female's left hand is _____ for a sample size of _____.