Chapter 20

MORE ABOUT TESTS AND INTERVALS

1

CRITICAL VALUES

- The α level you choose corresponds to a critical z-value (the z*).
- The traditional critical values from the normal model are

α	1-sided	2-sided
0.05	1.645	1.96
0.01	2.28	2.575
0.001	3.09	3.29

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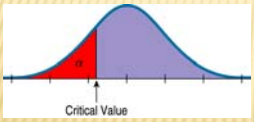
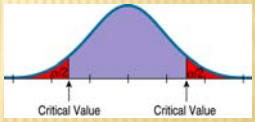
CRITICAL VALUES

- When the alternative is one-sided, the critical value puts all of α on one side:



- When the alternative is two-sided, the critical value splits α equally into two tails:



3

MAKING ERRORS

- When we perform a hypothesis test, we can make mistakes in *two* ways:
  I. The null hypothesis is true, but we mistakenly reject it. (Type I error)
     The probability of a Type I error is α
  II. The null hypothesis is false, but we fail to reject it. (Type II error)
     The probability of a Type II error is β

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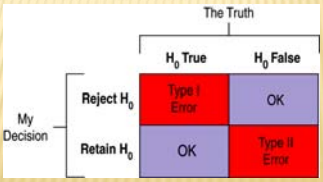
MAKING ERRORS (CONT.)

- Which type of error is more serious depends on the situation at hand. In other words, the gravity of the error is context dependent.
- Here's an illustration of the four situations in a hypothesis test:



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MAKING ERRORS (CONT.)

- How often will a Type I error occur?
  - Since a Type I error is rejecting a true null hypothesis, the probability of a Type I error is our α level.
- When H_0 is false and we reject it, we have done the right thing.
  - A test's ability to detect a false hypothesis is called the power of the test.
  - Power is given by $1 - \beta$

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