Lecture 20, October 10

Examples

Slides created by Ani Adhikari and John DeNero
Announcements

- Homework due Wed/Thu. We will post solutions promptly.
- Midterm Friday, here, during lecture hour. Please arrive promptly and follow seating instructions.
- Review textbook, homework, labs, project.
- Additional prep materials are in Files section of bCourses.
- My office hours tomorrow Tuesday 10/11: 1-2:30 instead of 10-11:30, in 413 Evans
Definition of $P$-value

The $P$-value is the chance,

- under the null hypothesis,
- that the test statistic
- is equal to the value that was observed in the data or
- is even further in the direction of the alternative.
Can a test’s conclusion be wrong?

Yes.

<table>
<thead>
<tr>
<th></th>
<th>Null is true</th>
<th>Alternative is true</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test rejects the null</td>
<td>✗️</td>
<td>✓</td>
</tr>
<tr>
<td>Test doesn’t reject the null</td>
<td>✓</td>
<td>✗️</td>
</tr>
</tbody>
</table>
An error probability

- The cutoff for the P-value is an error probability.

- If:
  - your cutoff is 6%
  - and the null hypothesis happens to be true

- then there is about a 6% chance that your test will reject the null hypothesis.
Assess this statement

“Statistical significance is an objective, unambiguous, universally accepted standard of scientific proof.”

― Letter to *Nature*, 1994
Deflategate

Patriots under pressure in 'Deflategate' scandal

Tim Green | Former NFL Player

Syracuse, NY
11:04 AM ET
Tom Brady Then
Tom Brady on Deflategate: 'I've just moved on, man'

Adam Kurkjian  Sunday, October 09, 2016