

Your Name: _____

Names of people you worked with: _____

1. With your friends, would you rather play board games / cards or play video games?
2. Do you worry more about type I errors or type II errors? Why?
3. Let's say you run 45 separate null and independent tests (at a 0.05 level of significance). That is, for each test the null hypothesis is true. And the 45 tests themselves are completely independent.
 - (a) How many of the tests would you expect to be significant?
 - (b) What is the probability that, out of the 45 null hypotheses, you reject at least one?

Solution:

3. (a) We know that we reject 5% of null tests, so we'd expect to reject $45 \cdot 0.05 = 2.25$ of the tests.
3. (b)

$$\begin{aligned} P(\text{rejecting at least one hypothesis}) &= P(\text{at least one type I error}) \\ &= 1 - P(\text{no type I errors}) \\ &= 1 - (1 - 0.05)^{45} \\ &= 0.9 \end{aligned}$$