Biostatistics – Homework 0

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1. Test whether there is a significant difference in IQ between the “high” and “low” lead level groups.
   1. Let µhigh and µlow be the average IQ scores for all children with high and low levels of lead exposure respectively.

H0: µhigh = µlow vs. HA: µhigh ≠ µlow

* 1. I performed a two-sample independent t-test with pooled variance.
  2. Test statistic = -1.71
  3. p-value: 0.0925
  4. Conclusion in context: Since our p-value is > 0.05, we fail to reject H0. In context, this means that we do not have evidence of a significant difference between the mean IQ scores for children with a high or low lead exposure. However, it is notable that 0.09 is relatively close to 0.05, so some may say that we marginally fail to reject H0. The confidence interval gives us a bit more insight – namely that we are 95% confident that the interval (-12.5192, 0.9767) contains the true value of the difference µhigh - µlow. This would indicate that if there were a significant difference between the IQs of the two groups, the group with low exposure would seem to have a higher mean IQ score.

1. SAS code:

/\* Generated Code (IMPORT) \*/

/\* Source File: LeadExposure.csv \*/

/\* Source Path: /home/mattisaac0/BioStatistics \*/

/\* Code generated on: 1/11/18, 8:30 AM \*/

\* %web\_drop\_table(WORK.LEAD);

FILENAME REFFILE '/home/mattisaac0/BioStatistics/LeadExposure.csv';

PROC IMPORT DATAFILE=REFFILE

DBMS=CSV

OUT=WORK.LEAD;

GETNAMES=YES;

RUN;

%web\_open\_table(WORK.LEAD);

\* t-test for IQ. Variance of high exposure group is approx. equal to variance of low exposure group. ;

proc ttest data = lead ci=equal umpu;

class exposure;

var iq;

run;