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Statistics for laboratory scientists II

Homework problems for lecture 2

1. Consider the data in the following table.

0	1	2	3	4	5	6	7	8	9
98	99	100	89	107	114	100	112	85	96

2. **Question:** Do these data look like they follow a multinomial distribution with $n=1000$ and $p_i=1/10$ for all i ? (i.e., do the digits 0-9 look equally likely?)
3. Use **R** to do the following.
 - a. Perform a chi-square goodness of fit test, using the appropriate asymptotic approximation to calculate a P-value.
 - b. Perform a likelihood ratio test for goodness of fit, using the appropriate asymptotic approximation to calculate a P-value.
 - c. If you are keen, use computer simulation to estimate P-values for each of the above
 - d. What do you conclude?
4. How would things be different if you observed the following table instead? (**Note:** the counts are the same, but are in a different order.)

0	1	2	3	4	5	6	7	8	9
114	112	107	100	100	99	98	96	89	85
