STAT011 Statistical Methods I

Midterm Exam II Review

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Midterm 2

- **Tuesday 4/16 during class time**
- Practice problems were sent yesterday
- Homework 9
  - Covers Lecture 18, 19 and 20
  - Due on Friday 4/12 11:59 pm
  - Solutions available on Saturday 4/13
- There will be office hours this afternoon 2:40 pm - 3:40 pm
- You may bring one two-sided cheat sheet to the exam.
- You will need a calculator with sufficient battery.

Statistical inference

Statistical Inference		No Explanatory	Explanatory		
			Binary	Categorical	Quantitative
Response	Binary	Inference of a proportion *(Lecture 18)*	Inference of two proportions *(Lecture 19)*		——
	Categorical	Goodness-of-fit test *(Lecture 20)*	Chi-squared test *(Lecture 20)*		——
	Quantitative	One-sample *t* test *(Lecture 15)*	Two-sample *t* test *(Lecture 16~17)*	——	Linear regression *(Lecture 22~25)*

To determine the method for an analysis, first identify number of variables in the problem and the types of the variables.

Statistical inference

- Confidence interval
  - How to compute the critical values and standard errors.
- Null & alternative hypotheses
  - What are the null and alternative hypotheses?
  - Hypotheses are about population parameters.
- Test statistic and distribution
  - How to calculate the test statistic. What is the distribution of the test statistic?
  - When using t procedures, first determine the degrees of freedom.
  - Chi-square test and chi-square goodness-of-fit test have different degrees of freedom.
- P-value
  - How to calculate the P-values based on the alternative hypothesis.
- Conclusion based on P-value

Equivalences

- A confidence interval can be used to determine the significance of a two-sided test.
- The significance of a test can be determined by either the P-value or the critical values based on α level.
- A chi-square test of a 2×2 table is equivalent to a two-sided test of two proportions.
  - But chi-square test does not tell us the direction of the relationship.