

Ch1-8 Review

13 Oct 2011
BUSI275
Dr. Sean Ho

- **HW5** due tonight
- **Midterm** next Thu
- **REB** forms due Tues

Overview, ch1-8

- Ch1: Variables, sampling
- Ch2: Exploring via charts
 - Ch3: Exploring via descriptives
- Ch4: Probability and independence
- Ch5: Discrete distribs: binom, Poisson, hypg
 - Ch6: Continuous distribs: norm, unif, expon
- Ch7, 8: Sampling distributions
 - SDSM (norm and t-dist), binomial
 - Types of problems: % area, conf. Int., n

Ch1: Introduction

- Population vs. sample
 - Sampling, inference
 - Statistics, parameters
- Sampling
 - Kinds of bias in collecting data
- 4 levels of measurement

Ch2-3: Exploring Data

- For **nominal** variables:
 - Charts: **bar/col, pie**
 - ◆ Joint distrib of **2 vars**: **pivot** table
 - Stats: **frequency** distribution
- For **scale** (quantitative) (interval/ratio) vars:
 - Charts: **histogram, ogive (cum), boxplot**
 - ◆ **2 vars**: **scatter**
 - ◆ Time series: **line**
 - Centre: **mean, median, mode**, (skew)
 - Quantile: **Q_1/Q_3 , %ile, IQR**
 - Std dev: **σ, s, CV , empirical rule, z-score**

Ch4: Probability

- Tree diagrams
- $P(A)$ notation, Venn diagrams
 - Sample space, outcome, event
 - n , U , complement
- Addition rule: $A \cup B = A + B - (A \cap B)$
 - Mutual exclusivity
- Conditional probability
 - What does it mean; how to find it (Bayes)
 - Statistical independence
 - ◆ Does $P(A|B) = P(A)$?

Ch5: Discrete distributions

- Binomial: BINOM(x, n, p, cum)
 - x: counting # of successes out of n trials
 - p: probability of success (binom proportion)
- Poisson: POISSON(x, λ , cum)
 - x: # occurrences within the time period
 - λ : mean (expected) # occ w/in the period
- Hypergeometric: HYPGEOMDIST(X, N, x, n)
 - X, N: # successes & tot size of population
 - ◆ Binomial $p = X/N$
 - x, n: # successes & tot size of sample

Ch6: Continuous distributions

- Normal: NORMDIST(x, μ , σ , cum)
 - Also NORMINV(area, μ , σ),
NORMSDIST(z), NORMSINV(area)
- Uniform:
 - $P(x) = 1/(b-a)$, $\mu = (a+b)/2$, $\sigma = \sqrt{((b-a)^2/12)}$
- Exponential: EXPONDIST(x, λ , cum)
 - x: time between occurrences
 - λ : 1 / (mean time between occurrences)
 - ◆ λ = expected frequency of occurrences
(e.g., occurrences per min)

Ch7-8: Sampling distributions

- Sampling distributions:
 - SDSM, w/ σ : NORMDIST(), SE = σ/\sqrt{n}
 - SDSM, w/ s : TDIST(), SE = s/\sqrt{n}
 - Binomial proportion: norm, SE = $\sqrt{(pq / n)}$
- Types of problems: area, μ , thresh, n, σ
 - Area: prob of getting a sample in given range
 - Threshold: e.g., confidence interval
 - n: minimum sample size

TODO

- HW5 (ch7-8): tonight 10pm
- REB form due Tue 18 Oct 10pm
 - If approval by TWU's REB is required, also submit printed signed copy to me
- Midterm (ch1-8): next week Thu