

# Projects for Assessment in Business Statistics

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In Loving Memory of  
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"One is so much  
less than two"  
John Tukey



**Description:** Eighteen projects, their solutions and corresponding WORD files are provided. The WORD files can be downloaded and assigned to your students. The WORD files can also be modified. Step by step instructions for using the TI 83 / 84 calculator for list management, calculating probabilities and confidence intervals are included. Step by step instructions for using MINITAB statistical software for making graphs and hypothesis testing are also provided. These projects are used in both my online and traditional classroom Business Statistics course.

Handouts are located online at:

<http://online.morainevalley.edu/websupported/jsukta/handouts/bstat.htm>

## List (data) Management



Select the TI-83 or the TI-Smartview screen to learn about:

- Saving data lists (STAT editor, L1 - L6) to named lists.
- Recalling named lists to the STAT editor (L1 - L6).
- Transferring lists from your calculator to TI-Smartview.



WORD 97, .doc files



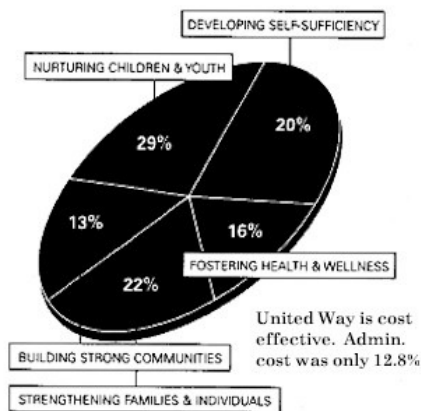
WORD 07, .docx files

Select the WORD icon on the left to be taken to the WORD documents (.doc and .docx files) for the projects.

**When you select a document, select "Cancel" if authentication information is requested. The document will then be displayed.**

Click on the name to view the projects.

## Projects



### Rationale: Descriptive Statistics

How difficult is it to construct a pie chart?

#### 1. Project: Descriptive Statistics



#### 2. Project: Quantitative Data.

Use Descriptive Statistics to organize raw data into a table, make graphs, find measures of central tendency, dispersion, and outliers.

### Rationale: Probability Distributions

How can the Las Vegas and other casinos make money on their games, video poker, and slot machines? Here are two projects that demonstrate how that is possible using probability distributions tables and expected value.

WIN A **\$1 MILLION** DREAM HOME,  
or \$1,000,000 in Cash!



National Association of Home Builders (NAHB)

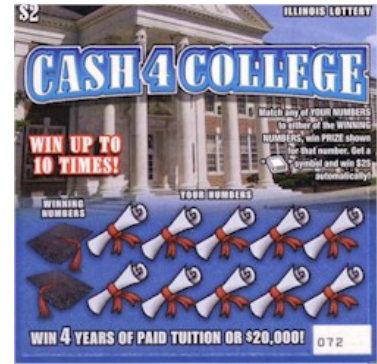
#### 3A. Project: Raffle

The actual home raffle site is :

<http://www.houseofdreamscharityraffle.org/Index.aspx>

**Cash 4 College** Win 4 years of College Tuition (An annuity of \$20,000 a year for 4 years) or \$20,000 cash. Each ticket costs \$2.00. There are 480,000 tickets.

3B. [Project: Cash 4 College](#)



4. [Project Probability: Space Shuttle.](#)



When the space shuttle was launched, the crew had the same chances of surviving as if they were playing Russian Roulette using a gun having 8 chambers and 1 bullet.

Source for the statements used in the project. "Against All Odds, Inside

Statistics": <http://www.learner.org/resources/series65.html>

When you select the episode you want to view by clicking on "VoD", you will be asked to register with an e-mail address and create a password. Once you have done this you can view any of the 26 episodes on the internet. The Space Shuttle Challenger is episode 16.



5. [Project: Normal Distribution.](#)

Calculate probabilities for a given  $x$  and determine  $x$  for a given probability. MINITAB, the Normal probability distribution table and the built in functions of the TI 83/84 series calculator will be used.



6. [Project Confidence Intervals: Drug Testing Race Horses.](#)

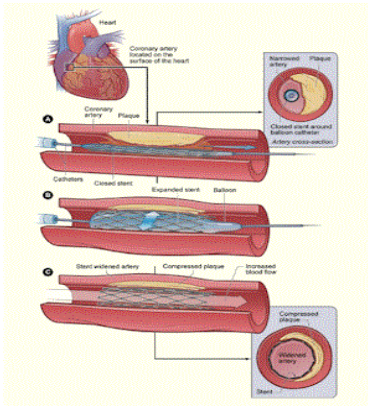
The Illinois State Racing Commission monitors horse racing at all the state racetracks and Summer county fairs. One test that is performed is a blood-gas analysis. This test measures the amount of Carbon Dioxide (CO<sub>2</sub>) in the blood. If the CO<sub>2</sub> level is 37 millimoles or more per liter for a nonlasix horse or 39 millimoles per liter or higher for a lasix horse, the horse is in violation.



7. [Project Confidence Intervals: Acceptance Sampling.](#)

Rather than test every item in a shipment, a sample is drawn. Based upon the sample, the shipment is accepted or rejected.

[Hypothesis Testing.](#) The 4 Step Process



8. [Project: Hypothesis Testing, Single Sample Proportions](#)

**Stents**

1. Are stents as effective as surgery?
2. Are drug coated stents better than bare metal stents?
3. Are stents less effective than medical therapy alone?



9. [Project: Hypothesis Testing, Who Gets the Contract?](#)

Six tire manufacturers submit tires to be tested. Which company satisfies both the mean and standard deviation specifications of the bidding and are awarded the the contract for tires for all vehicles of the Illinois State Police?

Point ↔ Counterpoint



10. [Project Hypothesis Testing Two Means: Is there Sex Discrimination in the Paycheck?](#)

Several major corporations have had to pay millions of dollars to settle "gender discrimination" lawsuits. As a result of these rulings, companies are very concerned with the parity of pay of their employees.

11. [Project: Hypothesis Testing: Two Means Revisited \(Normality\)](#)

In an effort to discredit labor's position, management argues that labor used an illegitimate test.

12. [Project Hypothesis Testing Two Proportions: Do Not Go To The Hospital On The Weekend!](#)

CHICAGO **SUN-TIMES**

## Hospital death rates higher on weekends

**BY JIM RITTER, HEALTH REPORTER** You have a greater chance of dying in the hospital if you are admitted on the weekend, when fewer doctors and nurses are working researchers have found. In 23 of the 100 leading causes of death, mortality rates for patients admitted on weekends were higher than rates patients admitted during the week, University of Toronto researchers report. There were no conditions in which death rates were lower on the weekends. Researchers defined weekends as the period from midnight Friday to midnight Sunday. Fewer staffers work then and those who do tend to have less seniority and experience. Moreover there are fewer supervisors on weekends and they are often in charge of staffers they don't know well. Dr. Bell and Dr. Redelmeier of The University of Toronto report in today's New England Journal of Medicine.

Researchers analyzed 3.8 million admissions from emergency rooms in Ontario, Canada. They found, for example, that 42 percent of patients admitted on weekends for ruptured abdominal aortic aneurysms died compared with 35 percent of patients admitted during the week.

Police and fire departments are fully staffed on weekends, and hospitals should try to follow the pattern of these essential services. Hospitals could entice doctors and nurses by paying more for weekend duty. Hospitals could save money because it would be more efficient to fully use expensive equipment seven days a week, Redelmeier said.

13. [ANalysis Of VAriance \(ANOVA 1 Way\)](#)

Is there a difference in the monthly premiums charged by an insurance company for a \$100,000 life insurance policy based on gender and whether the person smokes?

14. [ANalysis Of VAriance \(ANOVA 2 Way Block Design\)](#)

Is there a difference in the monthly premiums charged by an insurance company for a \$100,000 life insurance policy based on gender, whether the person smokes and their age?





15. [ANalysis Of VAriance \(ANOVA 2 Way with Replication\).](#)

Is there is a difference in the type of rewards that the holders of the Visa credit card choose when they redeem their reward points?

## U.S. NATIONAL DEBT CLOCK

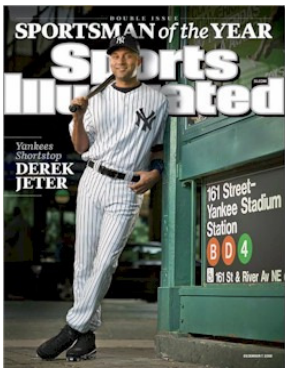
The Outstanding Public Debt as of 09 Nov 2010 at 09:31:09 PM GMT is:

**\$13,739,880,527,424.50**

The estimated population of the United States is **309,449,906** so each citizen's share of this debt is **\$44,400.98**.

Click on the National Debt to view the current debt.

16. [Project SLR: What will the national debt be in 2010?](#)



17. [Project Goodness of Fit: Binomial and Poisson Distributions](#)

Does Derek Jeter's hitting follow a Binomial or Poisson distribution ?

18. [Project Chi-Square: Post Position and Order of Finish.](#)

Is there a dependency between the starting gate position and whether a horse finishes in "first place"?

Source for the starting position statistics:

Balmoral Park:

<http://www.balmoralpark.com/Stats/Posts.pdf>

Maywood Park:

<http://www.maywoodpark.com/Stats/Posts.pdf>



If you have further questions, please contact me via e-mail: [jsukta@morainevalley.edu](mailto:jsukta@morainevalley.edu)

Thank you for your interest.

Charlotte and Joseph Sukta