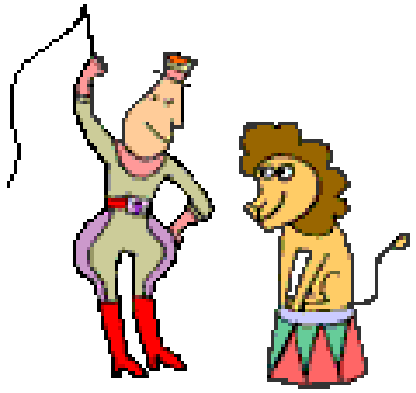

New Features in TamStat

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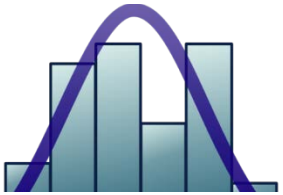
Dyalog 2016 Glasgow, UK

TamStat in the Classroom

- Spring 2016:
  - Statistics for Business II (Undergraduate Course) – Inferential Statistics and Regression
  - Management Science Module (MBA Course) – (Decision Science) – Simulation

Fall 2016

- Statistics for Business I (Undergraduate Course) – Statistical Measures, Probability, Discrete and Continuous Distributions



- Management (Decision) Science (Undergraduate Course) – Simulation

Management Science Module (MBA Students)

- Created an executable file which allows students to run on Windows PC by simply downloading it. No installer necessary.
- Crystal Ball Simulation program runs on Excel, but students must use lab or install trial version for 15 days on their PCs.
- TamStat simulation – easy to install and easy to run.
- Students did well on take home final exam using TamStat

Inferential Statistics Class (Undergraduate)

- Most common complaints
  1. TamStat won't run on a MAC
     - Dyalog free download permits use on a Mac (without GUI)
     - HTML5 will permit GUI on all platforms
  2. Can't use TamStat on a test
     - Can't use Minitab or Excel on a test either except in computer lab.
     - Individual student taking reader class brought in PC.
  3. Understanding TamStat Syntax
     - Introduce basic APL concepts such as arrays, functions, and operators.
     - Create expression builders

Introduce APL Syntax Using Concepts Familiar to Students

- Arrays

  Scalars, Vectors and Matrices as:

  items, lists and tables

- Functions

  Monadic, Dyadic, and Summary Functions

  $f(x) = \sqrt{x}$ $f(x, y) = x + y$ $y = f(x_1, x_2, \ldots, x_n) = f(\vec{\mathbf{x}})$

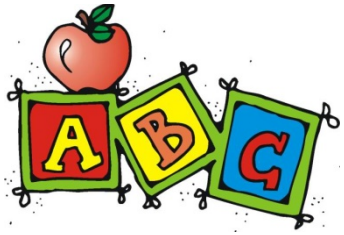
- Operators

  Derivative, Inverse, and Composition

  $y = f'(x)$ $y = f^{-1}(x)$ $y = (f \circ g)\,(x)$

  Calculus Pre-Calculus Pre-Calculus

Keep it simple!



- Maximum of one or two functions per expression
- Maximum of one operator
- Assign result for use in subsequent expression
- Don’t try to use complex one-liners!
- This avoids confusion over order of operations

Expression Builders

- Distribution Wizard
  - Probability, CriticalValue, RandomVariable
- Hypothesis Wizard
  - Mean, Proportion, Variance, one and two variables
- Graphics Wizard
  - Frequencies, BarCharts, Histograms, BoxPlots
- Regression Wizard
  - Simple and multiple regression, confidence and prediction intervals, residual plots

TamStat Demo

- …

Distribution Wizard

- 5 .2 binomial prob = 2
- 5 .2 binomial prob <= 2
- 5 .2 binomial randomVariable 10
- 5 .2 binomial theoretical mean 0
- normal prob < 1.5
- normal prob > 1.5
- normal prob between 1 2
- normal criticalValue > .90
- 5 tDist criticalValue < .05
- 5 chiSquare criticalValue < .01
- normal random variable 5

Hypothesis Wizard

- D<-import ‘’
- D.Height mean hypothesis = 68
- D.(State eq ‘PA’) proportion hypothesis > .25
- D.Height var hypothesis > 9

Graphics Wizard

- frequency D.State
- frequency D.State D.Sex
- barChart D.State
- barChart D.State D.Sex
- boxPlot D.Height
- boxPlot D.Height D.Sex
- histogram D.Height

Regression Wizard

- MODEL←Regress D.Height D.ShoeSize
- MODEL.f 9.5
- MODEL.f confInt 9.5
- MODEL.f predInt 9.5
- MODEL←Regress D.Height D.ShoeSize D.(Sex eq ‘M’)

Regression Problem

- **CSI Scranton:** You are investigating a murder and you find a bloody footprint near the victim. When you measure it, it matches a size 9-1/2 shoe. How tall is the suspect?
- After determining that the shoe print is that of a male suspect, find a model for determining the height of the suspect.
- Find a 95% prediction interval for the height of the suspect.