

NAME THAT SCENARIO: AN ONLINE STUDY TOOL FOR STATS 250

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Introduction

Name that Scenario (NTS) is an online learning tool that aims to help improve student learning in Stats 250 by offering students an opportunity to identify the correct statistical test from a given scenario. NTS was originally an application written in flash which was ported to JavaScript to improve its flexibility and generate better usage logs. The tool allows students to select up to 10 types of statistical tests about which they receive scenarios. NTS is made available to students 2 weeks before Exam 2 and is open until the end of the term.

Three Screen Shots of NTS

PARED 🖌	TWO-PROPORTION
ONE-MEAN	INDEPENDENT-T-TEST 🗸
- AVOVA	REGRESSION
CHI-SQUARE-INDEPENDENT	CHI-SQUARE-HOMOGENEITY
CHI-SQUARE-GOODNESS-OF-FIT	ONE-PROPORTION
Begin	
Clear Selectors	
C	Quantilary 4 (40)
Lorrect: 1	Question 4 / 10
elect their age range (18-24, for example) from 10 options and	a ne must cost messages. They send a survey to a random sample or their customers and ask then to to estimate the number of text messages they send per month.
PAIRED	ANOVA 🗸
INDEPENDENT-T-TEST	ns so there are 10 populations to be considered. Number of basis sent is the only writeble of encreases between are source, and a cost be. Tuano term can menu alkits using works the
INCEPENDENT-T-TEST Connect Good jub 3.The provider is interested in 10 age range interest hore. An ANOVA test will reneal if a significant differit motot messages. If the company had asked for specific ages in Contexes	ies, so there are 10 populations to be considered. Number of tests set to the only variable of more actual between age ranges, and a pair that. Takiny's test can reveal which range sends the totest, get could be treated as a quantitative variable dos and regression multi be not varial.
INCOMPOSIT-F1EST Convect Good jub 3 The provider is interested in 10 age range interest here. An AROXA text will recent if a significant differ most messages. If the company had asked for specific ages in Contrave Contr	es, othere ar 19 populations to be considered. Number of tests series to the only variable of encore onto between age ranges, and a pair hot. Tukeys test can reveal which manys earlies the notation, age could be traded as a quantitative variable also and regression would be most useful. Question 2.4.100
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Correct Cool jib 3 The provider is interested in 10 age range interest here. An ANOX test will reveal if a significant different matter message. The organization data with 6 specific age in Contexts Correct : 0 Correct to use if B system date or 5 years of data could propared the quantitative results.	es, so there are 10 populations to the considered. Number of tests seet is the only writishe of nece each between age ranges, and a part hot. Tukiny's test can reveal which range sends the network, age could be treated as a quantitative variable also and regression would be most unit.
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Design of NTS

NTS code follows a model-view-control design pattern which keeps the model code (application data), view code (display) and the control code (event handling) separate. This makes it easier to reuse and maintain. The scenario files are included in the application as JavaScript JSON files. Log events are fired from each of the event handlers in the control module to create log files from which we took the snapshots below.

rrwhen	url	categ	action	label	val	lion	
1383789541	/coach@/nts/	null	nul	nul	0	0	
1383782550	/coach@/nts/	nta	load	number_of_scenarios	4	['selections' ['PAIRED', 'ONE-MEAN', 'TWO-PROPORTION', 'INDEPENDENT-T-TEST']]	
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1383789603	/coachtl/nts/	rfs .	answar	correct	0	("correct": "0", "answer": "TWO-PROPORTION", "choice": "ONE-MEAN",	"question": "text"
1383789606	/coach8/nts/	15	continue-next-question	nul	0	0	
1383789614	/coach8/nts/	15	answer	correct	1	("correct": "1", "answer": "ONE-MEAN", "choice": "ONE-MEAN",	"question": "text"
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1383789629	/coach8/nts/	rits	answer	correct	0	("correct": "0", "answer": "INDEPENDENT-T-TEST", "choice": "TWO-PROPORTION",	"question": "text"
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1383789643	/coach9/nts/	nts	initialize	nul	0	0	
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1383805683	/coach0/rts/	115	initialize	rul	0	0					
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1383805704	/coach9/sts/	nts	load	number_of_scenarios	- 4	("selections" ["PAI	RED", "ONE-MEAN",	"TWO-PROPORTION",	"INDEPENDENT-T-TEST"	B	
1383805960	/coach0/ets/	rrts	answer	correct	1	("correct": "1",	"artswor":	"TWD-PROPORTION",	"choice":	"TWD-PROPORTION",	"question": "text"
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1383805748	/coach8/ms/	nts	continue-next-question	null	0	0					
1383805768	/coach0/sts/	ots	game-finished	null	0	0					

NTS Usage

Analysis on the usage logs tells us when students use NTS, which statistical tests they chose, how many they at once, and how often they answer correctly.



Analysis of Usage

On the left is a description of our matching algorithm which helps remove the selection bias in this observational data. On the right are four outputs from running this algorithm. There are 1632 students enrolled and 556 used NTS at least once. We look at usage for the Exam 2 study period and Final study period separately and group students in a period who are above the median usage in that period, comparing them on exam scores to everyone else.



We demonstrate the design of an online study tool which creates detailed usage logs and then use those logs to understand the tools adoption and effectiveness among students. We have found that students who used NTS and answered more than 20 questions prior to exam 2 did 3.3 / 75 points (~4.4%) better on that exam.

Acknowledgments

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