Topic: "One-Sample Test of Hypothesis Analysis"

Directions: The purpose of the one-sample test of hypothesis analysis is to enhance your ability to conduct statistical research. This involves the formulation of a hypothesis with appropriate literature review, gathering secondary data, and empirically testing your hypothesis.

Write a research paper of the length specified below that includes the following required sections:

Title Page (1 page)

Main Body of Paper (5 pages minimum)

Introduction

- Introduce your reader to your topic of research and explain why you feel it is a worthwhile investigation.
- State the null and alternative hypotheses and explain each.
- State the level of significance and determine the test statistic. Explain why you chose the level of significance and the test statistic.
- Formulate the decision rule and explain what it means.
- Use standard hypothesis testing notation or syntax throughout the paper prior to describing or explaining its meaning.

Methodology

- Describe the set of data you used, including correctly formatted citations and references to the data sources.
- Discuss the data using standard descriptive statistics.
- Create a table to summarize the data's descriptive statistics and refer to the table in your discussion.

- List the sources you used to compile the data and describe any complications or difficulties you may have encountered in collecting the data.
- Explain why you chose these data sources.

Results

- State the decision regarding the null hypothesis and explain why you made the decision you did.
- Explain what you concluded as a result of the decision you made.

Discussion

- Using your own critical thinking, evaluate, interpret, and qualify the results of your investigation and analysis, especially as it relates to your conclusions regarding the null hypothesis.

- Comment on how your research supported or did not support your original thinking with regard to the null hypothesis.
- Include any relevant research that supports or disagrees with your conclusion.
- Discuss what you learned from this research project and your candid opinion of its usefulness and relevance.

References (1 page): You should include **at least three academic sources** in addition to your textbook.

Question #1

Jacob Lee, is a frequent traveler between Los Angeles and San Francisco. For the past month, he wrote down the flight times on three different airlines. The results are:

Goust	Jet Red	Cloudtran
51	50	52
51	53	55
52	52	60
42	62	64
51	53	61
57	49	49
47	50	49
47	49	
50	58	
60	54	
54	51	
49	49	
48	49	
48	50	

a). Use the significance level and the six-step hypothesis- testing process to check if there is a difference in the mean flight times among the three airlines

b). Develop a 95% confidence interval for the difference in the means between Goust and Cloudtran.

Question #2

There are four McBurger restaurants in the Columbus, Georgia area. The numbers of burgers sold at the respective restaurants for each of the last 6 weeks are shown below. At the .05 significance level, is there difference in the mean number sold among the four restaurants when the factor of week is considered.

	Restaurant			
Week	Metro	Interstate	University	River
1	124	160	320	190
2	234	220	340	220
3	430	290	290	240
4	105	245	310	170
5	240	205	280	180
6	310	260	270	205

a). Is there a difference in the treatment means?

b). Is there a difference in the block means?

Question #3

Refer to the Baseball 2012 data, which report information on the 30 Major League Baseball teams for the American and National League teams?

a). At the .10 significance level, is there a difference in the variation in team salary among the American and National League teams?

b). Create a variable that classifies a team's total attendance into three groups: less than 2.0 (million), 2.0 up to 3.0, and 3.0 or more. At the .05 significance level, is there a difference in the mean number of games won among the three groups?

c). Using the same attendance variable developed in part (b), is there a difference in the mean number of home runs hit per team? Use the .05 significance level.

d). Using the dame attendance variable developed in part (b), is there a difference in the mean salary of the three groups? Use the .05 significance level.

t 2—Baseball Statistics, 2012 Season

Variables

x_1 = Team
x_2 = League (American = 1, National = 0)
x_3 = Built (year stadium was built)
x_4 = Size (stadium capacity)
x_5 = Salary (total 2012 team salary, $ millions)
x_6 = Wins
x_7 = Attendance (total for team in millions)
x_8 = BA (team batting average)
x_9 = ERA (team earned run average)
x_{10} = HR (team home runs)
x_{11} = Errors (team errors)
x_{12} = SB (team stolen bases)
x_{13} = Year
x_{14} = Average player salary ($)

(*continued*)

A.2 Data Set 2—Baseball Statistics, 2012 Season (*concluded*)

Team x_1	League x_2	Opened x_3	Capacity Seating x_4	Salary 2012 x_5	Wins x_6	Attendance x_7	BA x_8	ERA x_9	HR x_{10}	Errors x_{11}	SB x_{12}	Average Salary	
Arizona Diamondbacks	0	1998	48633	74.3	81	2.18	0.26	3.93	165	90	93	1989	$ 512,930
Atlanta Braves	0	1996	49586	83.3	94	2.42	0.25	3.42	149	86	101	1990	578,930
Baltimore Orioles	1	1992	45971	81.4	93	2.1	0.25	3.9	214	106	58	1991	891,188
Boston Red Sox	1	1912	37495	173.2	69	3.04	0.26	4.7	165	101	97	1992	1,084,408
Chicago Cubs	0	1914	41009	88.2	61	2.88	0.24	4.51	137	105	94	1993	1,120,254
Chicago White Sox	1	1991	40615	96.9	85	1.97	0.26	4.02	211	70	109	1994	1,188,679
Cincinnati Reds	0	2003	42319	82.2	97	2.35	0.25	3.34	172	89	87	1995	1,071,029
Cleveland Indians	1	1994	43429	78.4	68	1.6	0.25	4.78	136	96	110	1996	1,176,967
Colorado Rockies	0	1995	50398	78.1	64	2.63	0.27	5.22	166	122	100	1997	1,383,578
Detroit Tigers	1	2000	41255	132.3	88	3.03	0.27	3.75	163	99	59	1998	1,441,406
Houston Astros	0	2000	40981	60.7	55	1.61	0.24	4.56	146	118	105	1999	1,720,050
Kansas City Royals	1	1973	37903	60.9	72	1.74	0.27	4.3	131	113	132	2000	1,988,034
Los Angeles Angels	1	1966	45957	154.5	89	3.06	0.27	4.02	187	98	134	2001	2,264,403
Los Angeles Dodgers	0	1962	56000	95.1	86	3.32	0.25	3.34	116	98	104	2002	2,383,235
Miami Marlins	0	2012	36742	118.1	69	2.22	0.24	4.09	137	103	149	2003	2,555,476
Milwaukee Brewers	0	2001	41900	97.7	83	2.83	0.26	4.22	202	99	158	2004	2,486,609
Minnesota Twins	1	2010	39504	94.1	66	2.78	0.26	4.77	131	107	135	2005	2,632,655
New York Mets	0	2009	41922	93.4	95	2.24	0.25	4.09	139	101	79	2006	2,866,544
New York Yankees	1	2009	50287	198	74	3.54	0.27	3.85	245	74	93	2007	2,944,556
Oakland Athletics	1	1966	35067	55.4	94	1.68	0.24	3.48	195	111	122	2008	3,154,845
Philadelphia Phillies	0	2004	43651	174.5	81	3.57	0.26	3.83	158	101	116	2009	3,240,206
Pittsburgh Pirates	0	2001	38362	63.4	79	2.09	0.24	3.86	170	112	73	2010	3,297,828
San Diego Padres	0	2004	42691	55.2	76	2.12	0.25	4.01	121	121	155	2011	3,305,393
San Francisco Giants	0	2000	41915	117.6	94	3.38	0.27	3.68	103	115	118	2012	3,440,000
Seattle Mariners	1	1999	47860	82	75	1.72	0.23	3.76	149	72	104		
St. Louis Cardinals	0	2006	43975	110.3	88	3.26	0.27	3.71	159	107	91		
Tampa Bay Rays	1	1990	34078	64.2	90	1.56	0.24	3.19	175	114	134		
Texas Rangers	1	1994	48194	120.5	93	3.46	0.27	3.99	200	85	91		
Toronto Blue Jays	1	1989	49260	75.5	73	2.1	0.25	4.64	198	101	123		
Washington Nationals	0	2008	41487	81.3	98	2.37	0.26	3.33	194	94	105		