

Answer the questions and interpret the following test results using complete sentences following the format discussed in class.  $\alpha = 0.05$  for all tests in this homework.

**Example 1** (10pts): I obtained a sample of black bear remains from a cave in Missouri that date to approximately 200 years ago. Measurements on the teeth reveal that the caves captured large individuals. How large is the question? I compared tooth size from the cave bears to black bear teeth from the Midwest. Comparisons to modern samples of males and females were made to see if the cave bears differed in size from modern bears. The output below shows the results.

**Part 1**

	Kolmogorov Smirnov <sup>a</sup>			Shapiro Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Cave	.151	10	.200*	.965	10	.844
Males	.284	10	.022	.816	10	.023
Females	.140	10	.200*	.964	10	.027

**Part 2: Modern males & females vs. Caves**

	GroupM	N	Mean Rank	Sum of Ranks
MvsCave	1.00	16	17.22	275.50
	2.00	21	20.36	427.50
	Total	37		

	GroupF	N	Mean Rank	Sum of Ranks
FvsCave	1.00	10	8.80	88.00
	2.00	21	19.43	408.00
	Total	31		

**Test Statistics<sup>b</sup>**

	FvsCave
U	33.000
W	88.000
Z	-3.044
Asymp. Sig. (2-tailed)	.002
Exact Sig. [2*(1-tailed Sig.)]	.002 <sup>a</sup>

**Test Statistics<sup>b</sup>**

	MvsCave
U	139.500
W	275.500
Z	-.874
Asymp. Sig. (2-tailed)	.382
Exact Sig. [2*(1-tailed Sig.)]	.387 <sup>a</sup>

**Part 3: Interpretation of Part 1**

List the null and alternative hypotheses that were tested in this analysis.

On a separate sheet of paper, introduce what test was used in Part 1 and why it was run (#1). State the specific results in the next sentence (#2) and then state the implications of the results in the following sentence (#3). Then add one more sentence that discusses what the results mean for the rest of the analysis (the tests in Part2 are the rest of the analysis) (#4).

**Part 4: Interpretation of Part 2**

List the null and alternative hypotheses that were tested in this analysis.

On a separate sheet of paper, introduce what test was used in Part 1 and why it was run (#1). State the specific results in the next sentence (#2) and then state the implications of the results in the following sentence (#3). Then add one more sentence that discusses what the results mean for understanding this piece of research (#4).

**Example 2** (10pts): In HW5 you analyzed deer from 2002 to 2007 to determine whether or not size recently is significantly larger than during the population average for the last three and a half decades. You did this analysis to determine whether or not wildlife biologists have management the deer population in such a manner as to improve their population-level health. You know the population mean, so assume normality.

Part 1: 2002 to 2007 vs  $\mu$

	N	Mean	Std. Deviation	Std. Error Mean
Weight	110	42.8636	10.54173	1.00511

Test Value = 35.51						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Weight	7.316	109	.000	7.35364	5.3615	9.3457

**Part 2: Interpretation of Part 1**

List the null and alternative hypotheses that were tested in this analysis.

On a separate sheet of paper, introduce what test was used in Part 1 and why it was run (#1). State the specific results in the next sentence (#2) and then state the implications of the results in the following sentence (#3). Then add one more sentence that discusses what the results mean for understanding this piece of research (#4).

**Example 3** (10pts): Files for this part of the homework can be found on the website HW6.pdf and HW6.xls

The Parkwood Estates Water Authority (PEWA) monitors water use by residents of “the Estates.” Anyaridtown, not surprisingly, is arid. PEWA has produced two random samples (both n = 50) of residents, and they would like to find out among all residents who have only one kind of membership (golf only, swimming only, yachting only [3 separate groups]), those who have multiple types of memberships (e.g., golf and yachting, or some other combination [1 group = “multiple memberships”]), and those who have no memberships (1 group = “non-members”), is there a significant difference in terms of how much water one or more of these groups use on average in winter and summer?

Analysis 1) Compile data for each type of member by tallying member types (golf, swimming, yachting, multiple, non-members) from samples A and B; do this work in Excel and print it out to turn in. Test winter and summer water usage in each sample for normality.

Analysis 2) Do four ANOVAs or Kruskal Wallis tests (depending on whether or not you assume normality): one for each season by member type for A & B.

Answer:

- 1) What are the  $H_0$  and  $H_a$  for each analysis (including the normality tests)?
- 2) For each analysis do you accept or reject the null (including the normality tests)?

Communicate your results in the format discussed for the previous two examples; then with some attention to detail make suggestions to PEWA concerning their water conservation efforts.