

Assignment 7

Subjects ($n = 10/\text{trt}$) in an exercise therapy study were assigned to one of three weightlifting programs. In the first program (RI) the number of repetitions of weightlifting was increased as subjects became stronger. In the second program (WI) the amount of weight was increased as subjects became stronger. In the third program (CONT) subjects didn't participate in weightlifting. Strengths of the subjects were measured every other day for two weeks following the beginning of the study. The table below shows the strengths of the subjects at the seven periods of time.

Subject	PGM	s1	s2	s3	s4	s5	s6	s7
1	CONT	124	168	91	95	112	116	100
2	CONT	119	88	110	85	107	113	93
3	CONT	95	98	127	89	76	96	94
4	CONT	142	147	109	124	122	92	109
5	CONT	155	112	83	86	109	99	108
6	CONT	97	150	112	155	79	82	139
7	CONT	111	85	95	138	82	117	95
8	CONT	96	87	130	110	117	119	142
9	CONT	131	118	89	88	129	115	94
10	CONT	141	93	157	110	89	142	120
1	RI	118	120	111	159	128	154	117
2	RI	130	121	148	99	101	142	171
3	RI	106	123	114	155	95	109	157
4	RI	160	161	108	112	158	130	161
5	RI	101	125	163	100	134	121	105
6	RI	123	140	115	88	115	150	133
7	RI	147	89	101	115	103	108	100
8	RI	123	92	132	108	123	110	86
9	RI	142	151	92	94	111	95	115
10	RI	128	77	104	133	137	97	125
1	WI	157	143	147	150	147	160	105
2	WI	98	140	120	106	128	128	180
3	WI	108	108	130	140	138	144	198
4	WI	156	128	150	180	131	160	156
5	WI	85	136	159	113	157	148	126
6	WI	110	159	80	129	129	119	142
7	WI	127	147	122	154	122	115	136
8	WI	100	127	111	159	158	160	117
9	WI	100	91	113	112	102	141	149
10	WI	84	129	163	115	95	123	125

A) **In SAS** (upload the SAS program in Blackboard under Assignment 7A)

A1. Prepare an appropriate SAS program that will address questions on B. Grading will be based in your ability to include all the procedures that are necessary to answer questions on B.

B) In a MS word Document (upload the document in Blackboard under Assignment 7B)
Answer the following questions:

B1: Analyze the data using PROC MIXED or PROC GLIMMIX for repeated measurement over time (note: do not use other procedures, use only Proc Mixed or Glimmix for this assignment). Include all other regular procedures such as Proc Print and global statements.

a) Evaluate 4 covariance structures (use the SAS manual for more information). Prepare a summary table that will allow you to choose the most appropriate covariance structure. Indicate the rationale that you use to select the most appropriate covariance structure.

B2: Indicate the factor(s) or interactions among factors that you can make appropriate inferences and are significant in this experiment (use $\alpha = 5\%$). Provide a clear rationale for your conclusion on regard to the factors and interactions that are significant.

B3: Suppose that this was part of the results that will be included in a peer-reviewed publication.

a) Use a Tukey post-hoc comparisons with an $\alpha = 1\%$.

b) Using the manual step-by-step procedure discussed in class, separate appropriate means using letters. Provide clear evidence of the step-by-step procedure associated with the post-hoc comparison used in a) above.

c) Prepare a figure to show the averages of each treatment including letters and standard errors as discussed in class. Properly label the Y- and X-axis and remember that the title of the figure should stand alone. Write a statement as if you were writing the results and discussion sections of the paper (at least 100 words).