

# Assignment ON5

Elmer V Villanueva

Due at 3:55 PM on Monday 30 March 2020

## Instructions

You must attempt all questions. All answers must be submitted on ICE. The *ONLY* submission format accepted is an RMD file.

## Data

Family caregiving of older adults is common in South Korea. Son et al. [1] studied 100 caregivers of older adults with dementia in Seoul, South Korea. The dependent variable was caregiver burden as measured by the Korean Burden Inventory (KBI). Scores ranged from 28 to 140, with higher scores indicating higher burden. Explanatory variables were indexes that measured the following:

- **ADL**: total activities of daily living (low scores indicate that the elderly perform activities independently).
- **MEM**: memory and behavioral problems (higher scores indicate more problems).
- **COG**: cognitive impairment (lower scores indicate a greater degree of cognitive impairment).

**Table. Data from 100 caregivers from Son et al.**

ID	KBI	ADL	MEM	COG	ID	KBI	ADL	MEM	COG
1	28	39	4	18	51	88	76	50	5
2	68	52	33	9	52	54	79	44	11
3	59	89	17	3	53	73	48	57	9
4	91	57	31	7	54	87	90	33	6
5	70	28	35	19	55	47	55	11	20
6	38	34	3	25	56	60	83	24	11
7	46	42	16	17	57	65	50	21	25
8	57	52	6	26	58	57	44	31	18
9	89	88	41	13	59	85	79	30	20
10	48	90	24	3	60	28	24	5	22
11	74	38	22	13	61	40	40	20	17
12	78	83	41	11	62	87	35	15	27
13	43	30	9	24	63	80	55	9	21
14	76	45	33	14	64	49	45	28	17
15	72	47	36	18	65	57	46	19	17
16	61	90	17	0	66	32	37	4	21
17	63	63	14	16	67	52	47	29	3
18	77	34	35	22	68	42	28	23	21
19	85	76	33	23	69	49	61	8	7
20	31	26	13	18	70	63	35	31	26
21	79	68	34	26	71	89	68	65	6
22	92	85	28	10	72	67	80	29	10
23	76	22	12	16	73	43	43	8	13

ID	KBI	ADL	MEM	COG	ID	KBI	ADL	MEM	COG
24	91	82	57	3	74	47	53	14	18
25	78	80	51	3	75	70	60	30	16
26	103	80	20	18	76	99	63	22	18
27	99	81	20	1	77	53	28	9	27
28	73	30	7	17	78	78	35	18	14
29	88	27	27	27	79	112	37	33	17
30	64	72	9	0	80	52	82	25	13
31	52	46	15	22	81	68	88	16	0
32	71	63	52	13	82	63	52	15	0
33	41	45	26	18	83	49	30	16	18
34	85	77	57	0	84	42	69	49	12
35	52	42	10	19	85	56	52	17	20
36	68	60	34	11	86	46	59	38	17
37	57	33	14	14	87	72	53	22	21
38	84	49	30	15	88	95	65	56	2
39	91	89	64	0	89	57	90	12	0
40	83	72	31	3	90	88	88	42	6
41	73	45	24	19	91	81	66	12	23
42	57	73	13	3	92	104	60	21	7
43	69	58	16	15	93	88	48	14	13
44	81	33	17	21	94	115	82	41	13
45	71	34	13	18	95	66	88	24	14
46	91	90	42	6	96	92	63	49	5
47	48	48	7	23	97	97	79	34	3
48	94	47	17	18	98	69	71	38	17
49	57	32	13	15	99	112	66	48	13
50	49	63	32	15	100	88	81	66	1

## Questions

1. (10 marks) Construct a properly-formatted scatterplot matrix of the data.
2. (5 marks) Provide an evaluation of the relationships between pairs of variables in (1) above.
3. (10 marks) Find the multiple regression equation describing the relationship among these variables.
4. (40 marks) Interpret the intercept and each of the slope estimates.
5. (20 marks) Test the null hypotheses that the intercept and slope estimates are zero at  $\alpha = 0.03$ .
6. (20 marks) Construct 97% confidence intervals for the intercept and slope estimates.
7. (10 marks) Consider two new caregivers. Construct values for each of these caregivers' independent variables. Then produce 97% confidence and prediction intervals of the dependent variable.

## References

1. Son GR, Wykle ML, Zauszniewski JA. Korean adult child caregivers of older adults with dementia. *Journal of Gerontological Nursing*. 2003;29:19-28

**THE END**