Exercises: Module 1

1. The following tables are from the Witness data set.

Descriptive Statistics

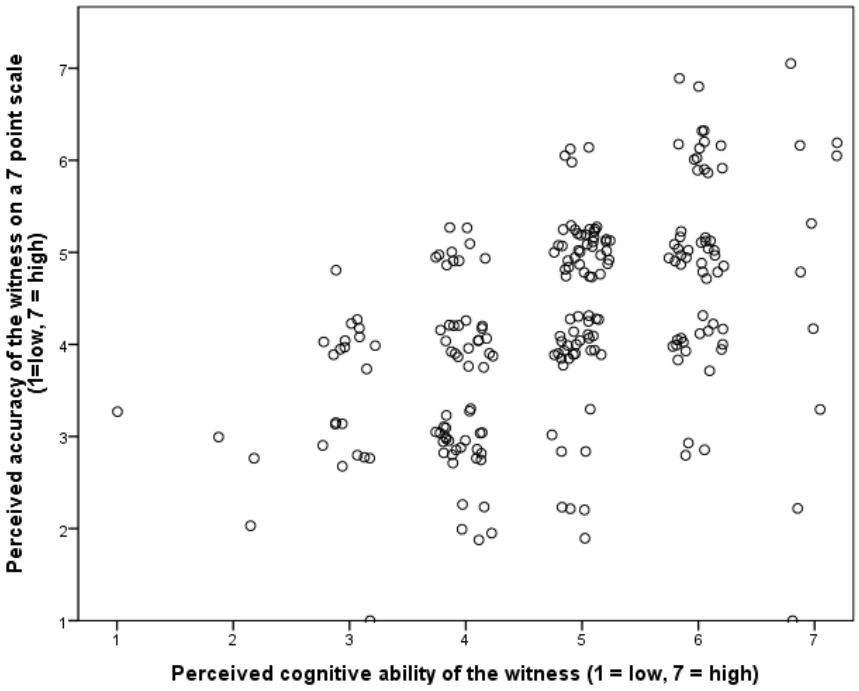
	N	Minimum	Maximum	Mean	Std. Deviation
Perceived accuracy of the witness on a 7 point scale	220	1	7	4.22	1.105
Perceived cognitive ability of the witness (1 = low, 7 = high)	220	1	7	4.83	1.113
Perceived honesty of the witness on a 7 point scale (1 = low, 7 = high)	220	2	7	5.91	.920
Perceived memory of the witness on a 7 point scale (1 = low, 7 = high)	220	2	7	4.45	1.052
Amount of time participant spends with seniors at home (10 = highest)	218	1	10	5.52	2.769
Amount of time participant spends with seniors at school (10 = highest)	216	1	10	3.79	2.643
Valid N (listwise)	214				

Pearson Correlations

	Perceived accuracy of the witness on a 7 point scale	The age of the witness in the fictitious trial	Perceived cognitive ability of the witness	Perceived honesty of the witness on a 7 point scale	Perceived memory of the witness on a 7 point scale	Amount of time participant spends with seniors at home	Amount of time participant spends with seniors at school
Perceived accuracy of the witness on a 7 point scale	1.000	.137*	.469**	.396**	.580**	-.076	.053
The age of the witness in the fictitious trial (49, 69, 79, 89)	.137*	1.000	.027	.162*	-.004	-.068	.021
Perceived cognitive ability of the witness	.469**	.027	1.000	.369**	.561**	.001	-.013
Perceived honesty of the witness on a 7 point scale	.396**	.162*	.369**	1.000	.380**	-.139*	-.074
Perceived memory of the witness on a 7 point scale	.580**	-.004	.561**	.380**	1.000	-.001	-.008
Amount of time participant spends with seniors at home	-.076	-.068	.001	-.139*	-.001	1.000	.500**
Amount of time participant spends with seniors at school	.053	.021	-.013	-.074	-.008	.500**	1.000

Here is a scatter plot between Cognitiv (X) and Accurate (Y). Please note that both variables are discrete, but I used the "jitter" function. That means that it adds a small random component to each point so that all points with the same value on both X and Y are not on top of each other, and you can therefore see how many there are at each point.

Describe the relationship you see, if any, between perceived accuracy and perceived cognitive ability of the witness.



Below are the results from a simple linear regression regressing Accurate (Y) on Cognitiv (X). What are the intercept and slope? What do they tell you about perceptions of Cognitive ability and Accuracy of witnesses?

Regression Coefficients

Dependent Variable:Perceived accuracy of the witness on a 7 point scale

Variable	B	se	t	P	95% Confidence Interval	
Intercept	1.972	.294	6.703	.000	1.392	2.552
COGNITIV	.465	.059	7.833	.000	.348	.582

Below are results from a multiple linear regression regressing Accurate on all the numerical predictors.

Regression Coefficients

Dependent Variable:Perceived accuracy of the witness on a 7 point scale

Variable	B	se	t	p	95% Confidence Interval	
Intercept	-.065	.500	-.129	.897	-1.051	.922
AGE_WITN	.006	.004	1.546	.124	-.002	.015
COGNITIV	.174	.064	2.717	.007	.048	.300
HONEST	.156	.071	2.191	.030	.016	.296
MEMORY	.480	.069	6.980	.000	.344	.616
SENIOR_H	-.046	.025	-1.867	.063	-.094	.003
SENIOR_S	.053	.025	2.067	.040	.002	.103

What is the intercept? What does it tell you?

What is the coefficient for each of the predictors? For each, write a single sentence that explains what it means.

Is the coefficient the same for Cognitiv as it was in the bivariate regression? What does that tell you about the effect of perceived cognitive ability on perceived accuracy of eyewitnesses?

2. The following tables are from the Births data set. Use all of them to help you answer the questions.

Recall:
bwt_pnds = Birth weight in pounds
pre_wgt = Maternal prepregnancy weight
wtgain = Maternal weight gain
del_wgt = Maternal delivery weight

Descriptive Statistics

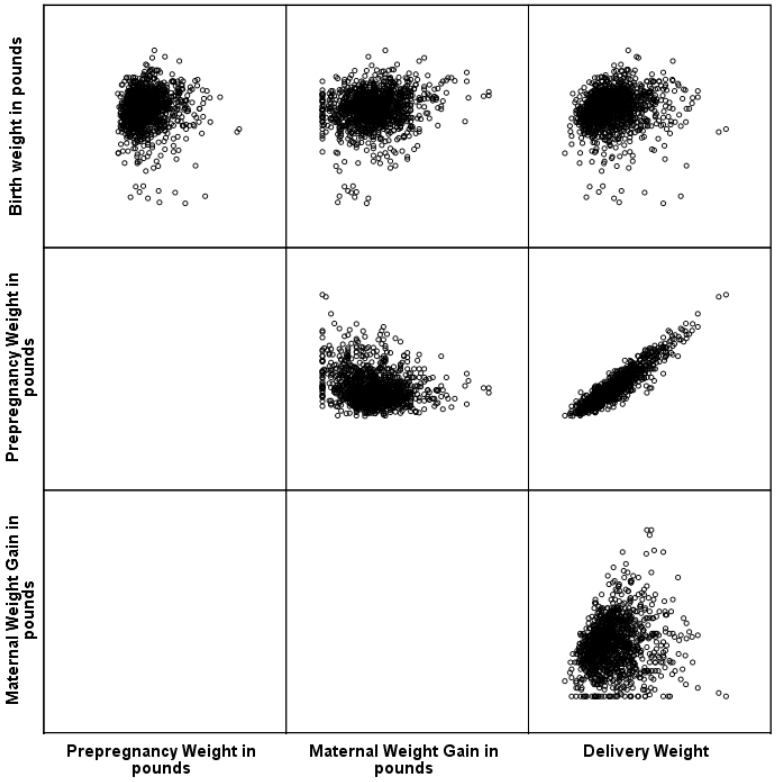
	N	Minimum	Maximum	Mean	Std. Deviation
bwt_pnds	1200	.56	11.38	7.2208	1.29469
pre_wgt	1200	89	375	155.54	39.917
wtgain	1200	0	98	30.24	14.907
del_wgt	1200	100	385	185.72	39.403

Correlations

	bwt_pnds	wtgain	pre_wgt	del_wgt
bwt_pnds	1	.185**	.063*	.134**
wtgain	.185**	1	-.224**	.156**
pre_wgt	.063*	-.224**	1	.928**
del_wgt	.134**	.156**	.928**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).



Below are the results from a simple linear regression regressing infant birthweight (Y) on *maternal prepregnancy weight* (X). What are the intercept and slope? What do they tell you about the predictive relationship between maternal prepregnancy weight and infant birthweight?

Regression Coefficients

Dependent Variable: bwt_pnds

Variable	B	se	t	p	95% Confidence Interval	
Intercept	6.901	.150	45.954	.000	6.606	7.196
pre_wgt	.002	.001	2.198	.028	.000	.004

In the following tables, we have run two more regression models.

How does the intercept change across models? What does it tell you?

The second adds *weight gain during pregnancy* to the model, and the third also adds *maternal weight at delivery*. All variables are measured in pounds.

What is the coefficient for each of the predictors? For each, write a single sentence that explains what it means, looking at all three models.

Regression Coefficients

Dependent Variable: bwt_pnds

Variable	B	se	t	p	95% Confidence Interval	
Intercept	6.115	.183	33.434	.000	5.756	6.474
pre_wgt	.004	.001	3.803	.000	.002	.005
wtgain	.018	.003	7.227	.000	.013	.023

ANOVA

Dependent Variable: bwt_pnds

Source	Type III Sum of Squares	df	Mean Square	F	p
Model	92.827[a]	3	30.942	19.305	.000
pre_wgt	1.309	1	1.309	.817	.366
wtgain	2.503	1	2.503	1.562	.212
del_wgt	1.072	1	1.072	.669	.414
Error	1916.966	1196	1.603		
Corrected Total	2009.793	1199			

a. R Squared = .046 (Adjusted R Squared = .044)

Regression Coefficients

Dependent Variable: bwt_pnds

Variable	B	se	t	p	95% Confidence Interval	
Intercept	6.102	.184	33.226	.000	5.742	6.462
pre_wgt	.037	.041	.904	.366	-.044	.119
wtgain	.052	.042	1.250	.212	-.030	.135
del_wgt	-.034	.041	-.818	.414	-.115	.047