

Comments on homework (Week 7, Z-test)

- Bear in mind 4 types of standard error used to carry out z-test (one-sample/two-sample and test statistic/confidence intervals)
- Statistical tables (at the end of the Coursepack) give one-sided probability (p-value). If you are doing two-sided test ($H_0 : \pi = \pi_0$ rather than e.g. $H_0 : \pi > \pi_0$), don't forget to multiply p-value by 2.
- "More likely to vote Lib Dem" conclusion.
- Class/Homework output is available on Moodle.
- Check the sample answers that are available on Moodle.

Z-test (standard errors)

	Test Statistic	Confidence Interval
One-sample	$\hat{\sigma}_{\hat{\Delta}} = \sqrt{\frac{\pi_0(1-\pi_0)}{n}}$	$\hat{\sigma}_{\hat{\Delta}} = \sqrt{\frac{\hat{\pi}(1-\hat{\pi})}{n}}$
Two-sample	$\hat{\sigma}_{\hat{\Delta}} = \sqrt{\hat{\pi}(1-\hat{\pi})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$	$\hat{\sigma}_{\hat{\Delta}} = \sqrt{\frac{\hat{\pi}_1(1-\hat{\pi}_1)}{n_1} + \frac{\hat{\pi}_2(1-\hat{\pi}_2)}{n_2}}$

Correlation and simple linear regression

- Explanatory (independent) variable: X ,
measured at interval/ratio level (continuous)
- Response (dependent) variable: Y ,
measured at interval/ratio level (continuous))
- Correlation (standartized covariance) - a measure of
association between the two.
- Check-out these websites:
 - ▶ Spurious correlations:
<http://tylervigen.com/spurious-correlations>
 - ▶ Guess the correlation: <http://guessthecorrelation.com/>

Correlations

	points_ 100m	points_ 110m hurdles	points_ 400m	points_ 1500m	points_ highjump	points_ longjump	points_ polevault	points_ shotput	points_ discus	points_ javelin	total points
points_100m	1	.620	.771	.162	-.076	.567	.098	.155	.150	-.142	.573
points_110mhurdles	.620	1	.513	-.039	.091	.281	.267	.288	-.033	-.077	.497
points_400m	.771	.513	1	.484	.228	.661	.061	.096	.039	.128	.715
points_1500m	.162	-.039	.484	1	.438	.493	.196	-.316	-.088	.580	.622
points_highjump	-.076	.091	.228	.438	1	.460	.326	-.017	.003	.538	.588
points_longjump	.567	.281	.661	.493	.460	1	.317	.182	.122	.340	.845
points_polevault	.098	.267	.061	.196	.326	.317	1	.043	-.396	.104	.439
points_shotput	.155	.288	.096	-.316	-.017	.182	.043	1	.264	-.091	.227
points_discus	.150	-.033	.039	-.088	.003	.122	-.396	.264	1	.095	.175
points_javelin	-.142	-.077	.128	.580	.538	.340	.104	-.091	.095	1	.541
total points	.573	.497	.715	.622	.588	.845	.439	.227	.175	.541	1