Econometrics I, quiz 8

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1. This is a 20-minute quiz

2. At **NO** point in the exam can you discuss the questions/answers with any of your colleagues.

3. When a multiple choice is present, circle the number indicating your choice of the answer.

4. Good luck. :-)

- **Q1** : The table below shows the number of newborn girls and boys in the UK for 2003 and 2004.

	boys	girls
2003	356578	338971
2004	367586	348410

1. Set up the Bernoulli model for 2003.**(3 points)**

2. Estimate the success parameter for the fraction of girl children births for 2003. **(1 point)**

3. Construct a 99% confidence interval for estimator $\hat{\theta}_{2003}$. **(1 point)**

4. Find the 1% level LR test for the null hypothesis, $H_0 : \theta_{2003} = 0.4$. **(1 point)**

5. Consider the restricted model where the success parameter is the same in both years. What is the maximum likelihood estimate? **(1 point)**

6. Calculate the log-likelihood ratio test statistic for the hypothesis. **(1 point)**

7. Test the hypothesis by comparing the LR to a $\chi^2(1)$ distribution. Do you accept or reject the null at 99% level of significance? **(1 point)**

∗∗ Information you may require to answer the questions.

P($X > x$)	0.10	0.05	0.01	0.005
$x \sim N(0,1)$	1.650	1.960	2.580	2.807
$x \sim \chi^2(1)$	2.706	3.841	6.635	7.879