TMA 4295 Statistical Inference 2014
Self-study - Chapter 9

9.1 - definitions

Be aware of the definitions of

Confidence set $C(\boldsymbol{X})$ - a subset of the parameter space, where we have "confidence" that the true θ is. $C(\boldsymbol{X})$ must not involve unknown parameters.

Confidence interval The special case when $C(\boldsymbol{X})$ is an interval $[L(\boldsymbol{X}), U(\boldsymbol{X})]$.

Coverage probability $P_\theta(\theta \in C(\boldsymbol{X}))$.

Confidence coefficient $\min_{\theta\in\Theta} P_\theta(\theta \in C(\boldsymbol{X}))$. The guaranteed coverage probability of $C(\boldsymbol{X})$. In standard confidence intervals, the coverage is $1-\alpha$ for all values of θ.

You may skip Example 9.1.6 in the first reading.

9.2.1 - inverting a test statistic

Example 9.2.1 is the standard case which you may have seen in earlier courses. Example 9.2.3 is more involved, but Example 9.2.4 is illustrative. You should skip Example 9.2.5.

9.2.2 - using pivots

This is the method you have seen most of the time in the previous courses. The typical example is Example 9.2.10, which you may read first. This example motivates the definition in 9.2.6, and the special cases in 9.2.7. Examples 9.2.8-9.2.9 can be read afterwards.

9.2.3 - more pivoting

Theorem 9.2.12 and Example 9.3.13 are of spcial interest. Also Theorem 9.2.14 and the succeeding example 9.2.15 can be read.

9.2.4 - Bayesian intervals

This is a fairly simple use of the posterior densities that we consdiered in Section 7.2.3. Hava a look at it!

9.3.1 - methods for evaluating interval estimators

Read introduction plus 9.3.1 only. The result on how to find the shortest confidence intervals is interesting!