Imprecise Inference for Poisson Sampling Model

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1 Getting Started

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library(imPois)
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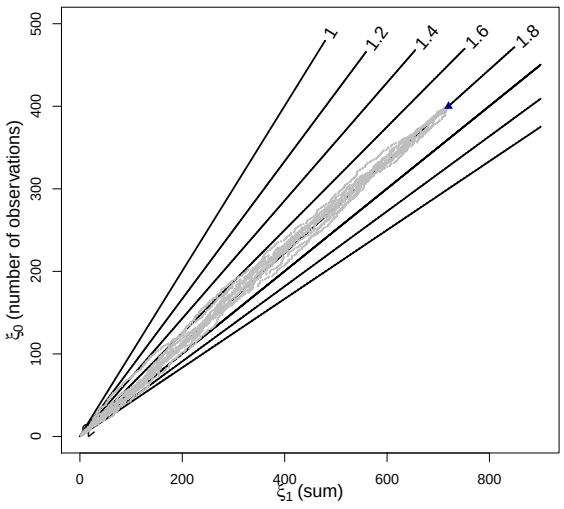
2 Simulation

The following data is taken from the xample in Howlader and Balasooriya (2003) as below:

y	0	1	2	3	4	5	6	7	8	9	Total
n_y	75	103	121	54	30	13	2	1	0	1	400

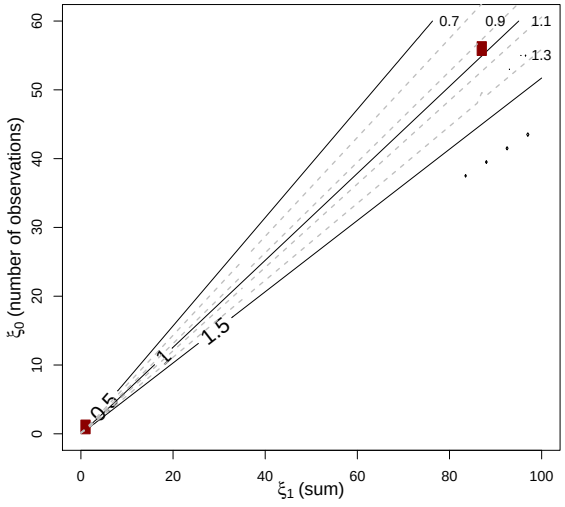
For this data, $n = 400$, $T = 720$ so that MLE of λ is $\bar{x} = 1.8$.



3 Application

The following data is taken from the example in Dahiya and Gross (1973) as below:

y	1	2	3	4	Total
n_y	32	16	6	1	55



We characterize an imprecise prior for inference by specifying the hyperparameter space such as $\{(\xi_1, \xi_0)|(0,0)\times(1,1)\}$. Posterior minimum and maximum produced from this specification are $\underline{E}^{\mu}_{\xi_1,\xi_0}[Y] = 0.927$ and $\overline{E}^{\mu}_{\xi_1,\xi_0}[Y] = 0.997$. Note that Dahiya and Gross (1973) reported $\hat{\lambda}_{MLE} = 0.970$. This estimate can be obtained numerically. Later, Irwin (1959) found an explicity expression of $\hat{\lambda}_{MLE} = 0.9722$.

References

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