

## Spatial Econometrics: Problem Set 4

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This problem set is due on Wednesday 22th, November at 18:00. The solutions must be submitted in a **printed form**.

### 1 THEORY

1. (Asymptotics): Consider a case when all cross-sectional units are assumed to be neighbours of each other. That is, all off-diagonal elements of  $\mathbf{W}$  are  $w_{ij} = 1$ . Show that Assumption 3 in Lee (2004) is not met.
2. (LR Test) Consider the following SAC model:

$$\mathbf{y} = \rho \mathbf{W}\mathbf{y} + \mathbf{X}\boldsymbol{\beta} + \mathbf{u}$$

$$\mathbf{u} = \lambda \mathbf{M}\mathbf{u} + \boldsymbol{\varepsilon}$$

$$\boldsymbol{\varepsilon} \sim N(\mathbf{0}, \sigma^2 \mathbf{I}_n)$$

Derive the Likelihood Ratio test for  $H_0 : \rho = 0$ .