Figure 12.1. Summary of the SPDE approach. We specify a model with a spatial correlated random effect u. After making a series of assumptions (u is Markovian, its covariance matrix Σ is modelled with the Matérn correlation function) and numerical approximations (use SPDE for a GMRF defined on each vertex of a mesh) we end up with an approximation of u and its covariance matrix.
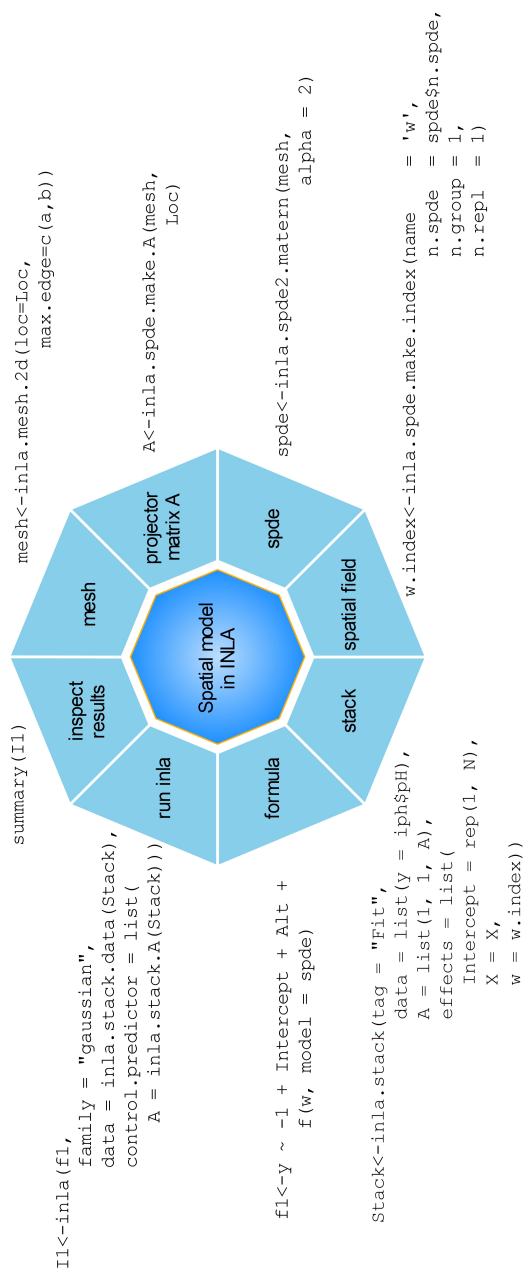
Figure 12.2. Outline of the required steps to apply a model with a spatial correlated random intercept in R-INLA. Starting point is the mesh. The R code, which is at the outside of the trapezoid ring, is discussed in the next sections.