Mixture estimation - predictive components

The components have the form

$$f_j\left(y_t|\psi_t,\theta_j\right)$$

where ψ_t contains some delayed values of y.

Estimation of scalar normal regression mixture

In this example we show how a dynamic mixture can be used for prediction of the target variable y_t. Here, zero step prediction is tackled. To be able to predict from a mixture, we need to predict from all components and also to predict the pointer. Then, we combine the component prediction with weights given by the pointer prediction. As the pointer prediction is performed without knowing y_t that mainly decides about the classification, the prediction is not very strong and is suitable only for certain type of data (where the switching among the components is sufficiently distinctive).

In this example, due to its goal (prediction), a dynamic categorical model of the pointer $f\left(c_t|c_{t-1},\alpha\right)=\alpha_{c_t|c_{t-1}}$ is used.

The program also shows how to enforce the prior knowledge into the normal components with a specified force.

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Scalar normal regression mixture with multi-step prediction

The program is exactly the same as the previous one only the prediction can be constructed arbitrary many steps ahead.

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Estimation of multivariate normal regression mixture

This case is identical with the first one, only the data involved are multivariate.

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Prediction with a mixture with state-space components

This algorithm is a generalization of `T33stPre.sce` (prediction with state-space model) to mixture estimation. Similarly to this program, the prediction is constructed by repetitive calling the prediction from Kalman filter. The prediction is computed for each component separately (see `T49mixDesStat.sce`) and finally the result is composed as weighted average of the components results.

Program and its description

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