The most important component of virtually any dialog system is a dialogue manager. The aim of the dialog manager is to propose an action (a continuation of the dialogue) given the last dialog state. The dialog state summarises all the past user input and the system input and ideally it includes all information necessary for natural progress in the dialog. For the dialog manager to work efficiently, it is important to model the probability distribution over all dialog states as precisely as possible. It is possible that the set of dialog states will be very large, so approximative methods usually must be used. In this thesis we will discuss an implementation of approximate Bayes methods for belief state monitoring. The result is a library for dialog state monitoring in real dialog systems.