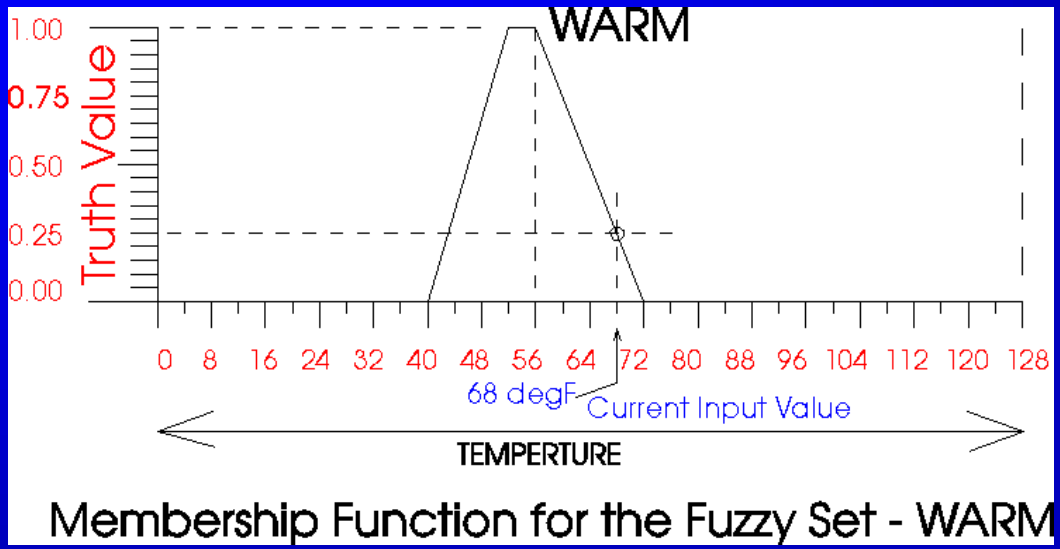
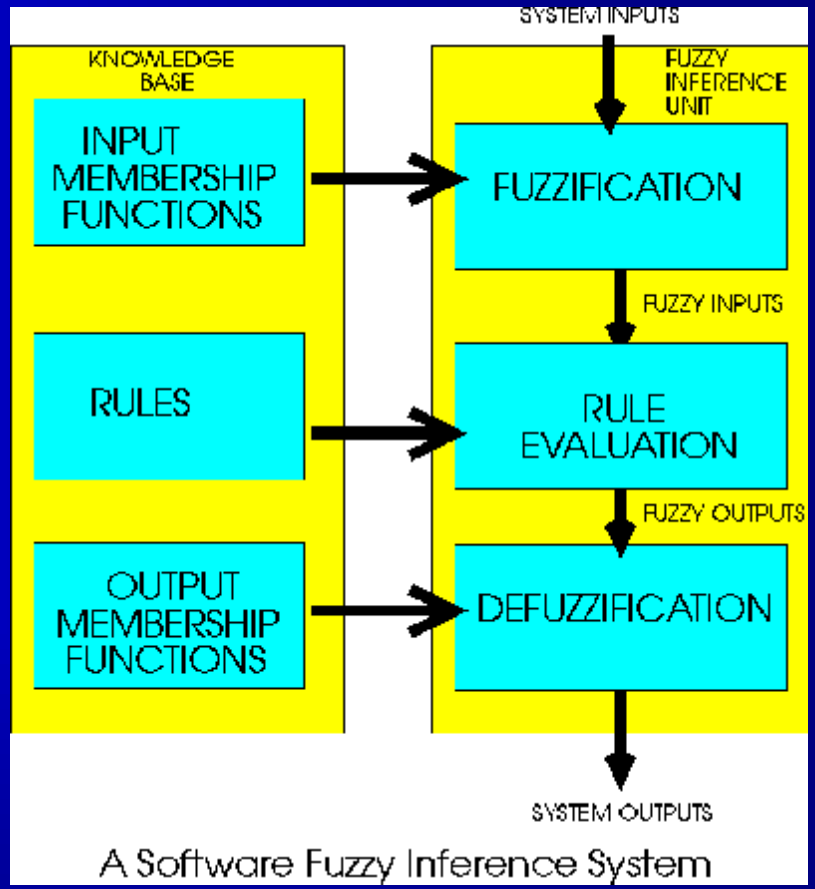
Fuzzy logic



Membership Function for the Fuzzy Set - WARM

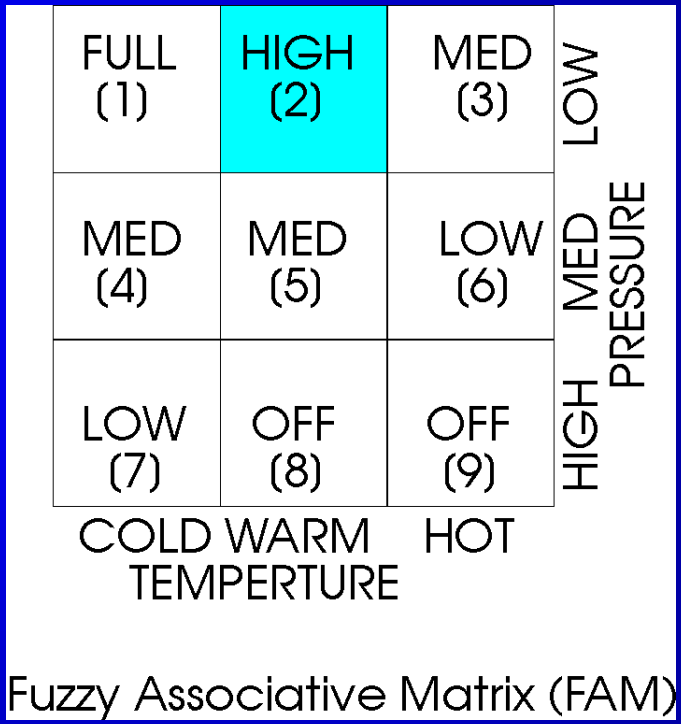


A Software Fuzzy Inference System

Since we can assign numeric values to linguistic expressions, it follows that we can also combine such expressions into rules and evaluate them mathematically.
A typical fuzzy logic rule might be:

If temperature is warm and pressure is low then set heat to high

[A graphical illustration to fuzzy logic, http://www.mcu.motsps.com/lit/tutor/fuzzy/fuzzy.html,]



Fuzzy Associative Matrix (FAM)

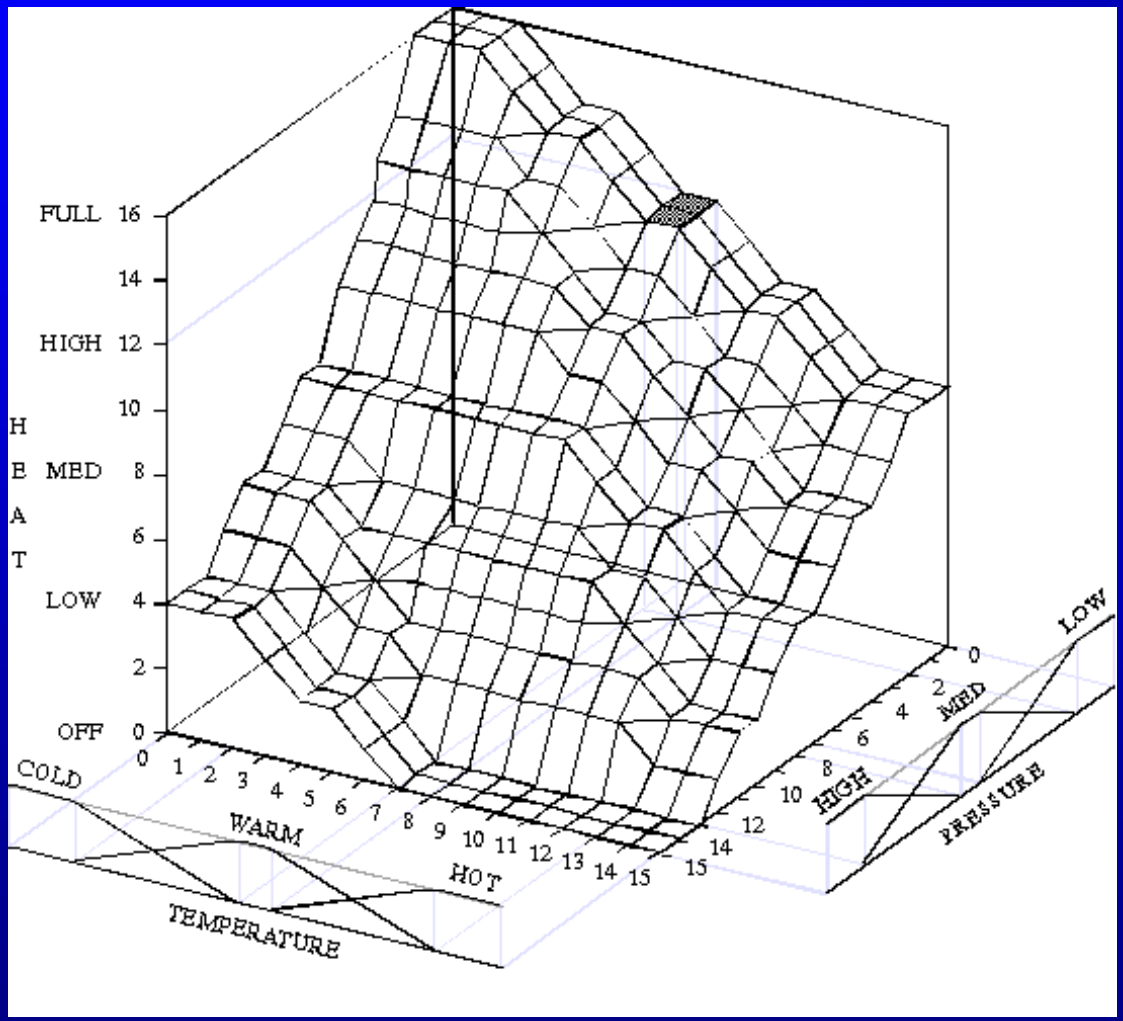
How Rules Relate to a Control Surface

A fuzzy associative matrix (FAM) can be helpful to be sure you are not missing any important rules in your system. Figure shows a FAM for a control system with two inputs, each having three labels. Inside each box you write a label of the system output. In this system there are nine possible rules corresponding to the nine boxes in the FAM. The highlighted box corresponds to the rule:

If temperature is warm and pressure is low then set heat to high

[A graphical illustration to fuzzy logic, http://www.mcu.motsps.com/lit/tutor/fuzzy/fuzzy.html]

Three Dimensional Control Surface



The input to output relationship is precise and constant. Many engineers were initially unwilling to embrace fuzzy logic because of a misconception that the results were not repeatable and approximate. The term fuzzy actually refers to the gradual transitions at set boundaries from false to true.

[A graphical illustration to fuzzy logic, http://www.mcu.motsps.com/lit/tutor/fuzzy/fuzzy.html]