Alexander Technological Educational Institute
of Thessaloniki
Dept. of Information Technology

Intelligent Systems

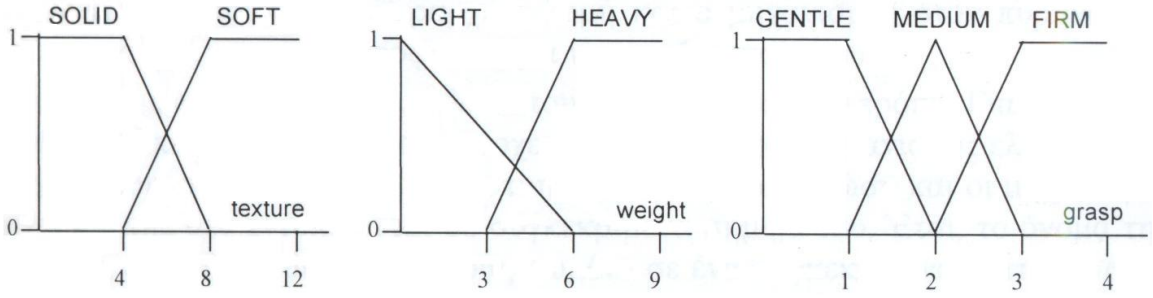
Department of Information Technology

Fuzzy Systems Assignments

(Only 80% of the marks for the first two assignments)

1. We have a robotic arm and we want to create a Fuzzy inference System (FIS) that will control the grip of the robotic arm. Input data for the FIS are the texture of the object and its weight. The output is the force that has to be exercised by the grip of the robotic arm (grasp). The rules that control the system are:
   - if texture is SOLID and weight is HEAVY then apply FIRM grasp
   - if texture is SOLID and weight is LIGHT then apply MEDIUM grasp
   - if texture is SOFT and weight is HEAVY then apply MEDIUM grasp
   - if texture is SOFT and weight is LIGHT then apply GENTLE grasp

   The membership functions of the linguistic terms for the fuzzy variable texture, weight and grasp are given in the following diagrams:



   After creating the FIS, you have to use it to:

   a) Compute the value of the force that has to be exercised by the grip (grasp) when the input data are: texture=5 (in some texture scale) and weight=7 (in a weight scale).

   Solve the same problem diagrammatically. The value of grasp must be approximately calculated from the diagram.