

## Fuzzy Expert System for assessing mortgage applications

A legal agreement between the loan borrower (the mortgagor) and loan granting company (the mortgagee) in order to take loan on the basis of borrowers assets and income.

**Problem:** you are given property information of a person like his income, house information (market value, location), assets and interest rate of loan. You have to design a fuzzy expert system which will take all these things as an input and gives us a result that how much loan will grant for that person by the mortgagee.

### How to Apply:

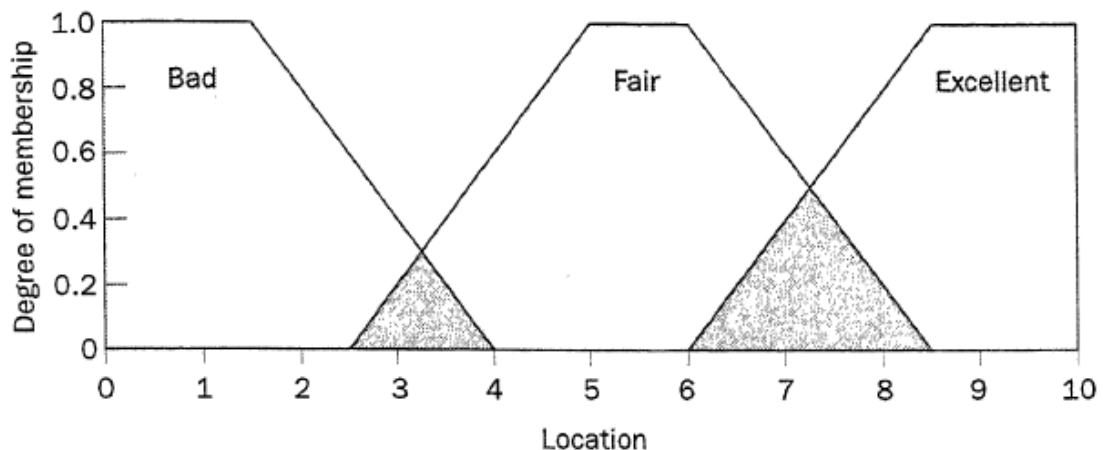
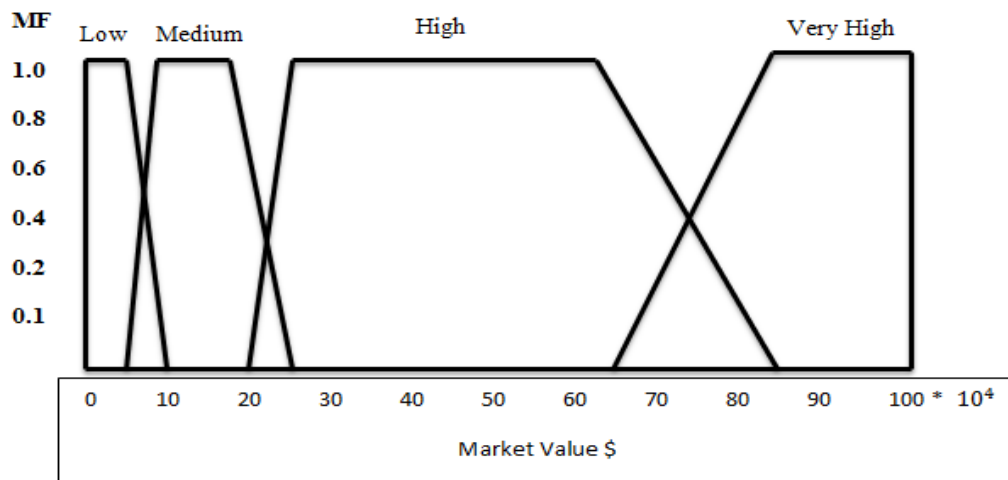
You have to design three fuzzy inference systems (1) Home Evaluation (2) Applicant Evaluation and (3) Credit Evaluation, design structure and rules as discussed below.

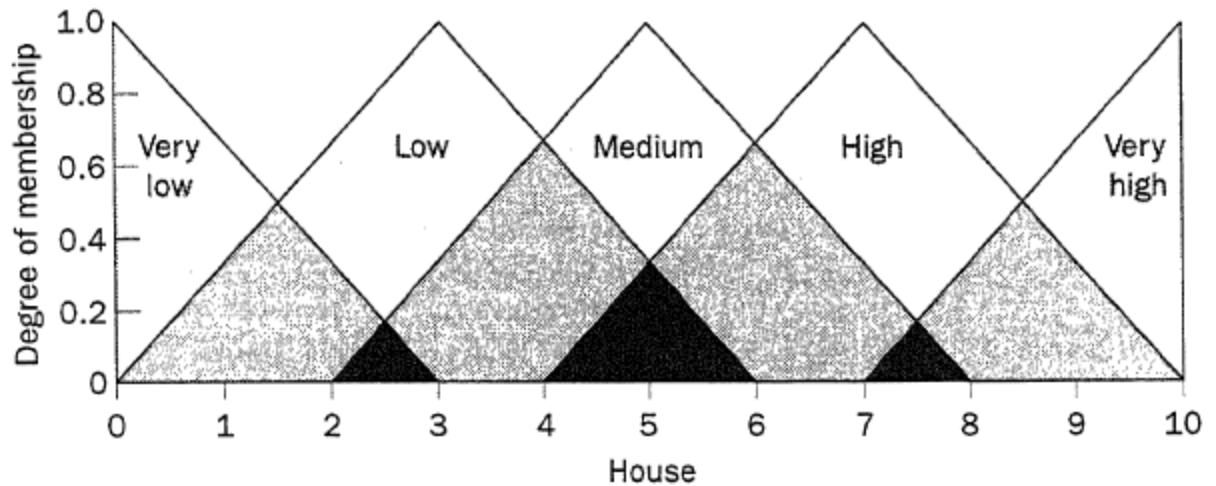
#### 1. Home Evaluation

*Input 1: Market Value (\$)*

*Input 2: Location*

*Output: House*





### Rule Base 1: Home Evaluation

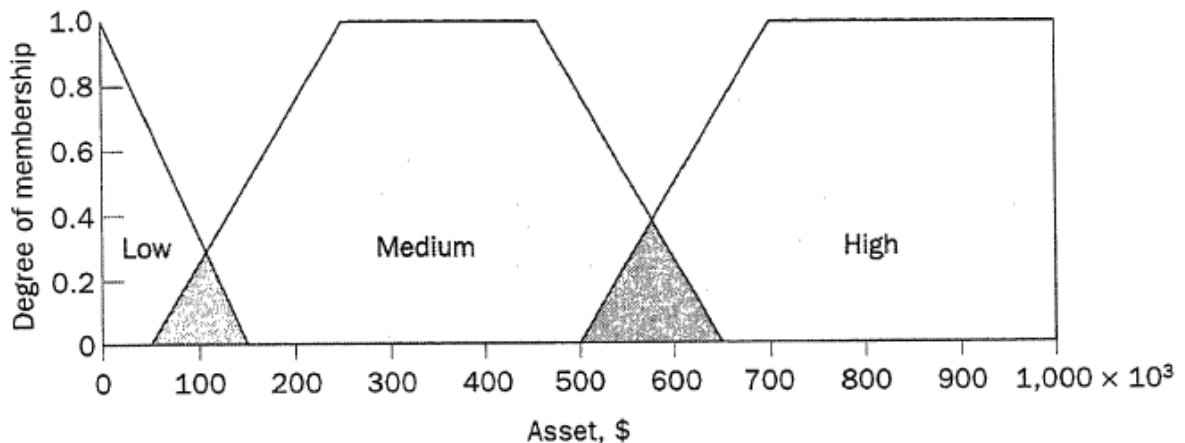
1. If (Market\_value is Low) then (House is Low)
2. If (Location is Bad) then (House is Low)
3. If (Location is Bad) and (Market\_value is Low) then (House is Very\_low)
4. If (Location is Bad) and (Market\_value is Medium) then (House is Low)
5. If (Location is Bad) and (Market\_value is High) then (House is Medium)
6. If (Location is Bad) and (Market\_value is Very\_high) then (House is High)
7. If (Location is Fair) and (Market\_value is Low) then (House is Low)
8. If (Location is Fair) and (Market\_value is Medium) then (House is Medium)
9. If (Location is Fair) and (Market\_value is High) then (House is High)
10. If (Location is Fair) and (Market\_value is Very\_high) then (House is Very\_high)
11. If (Location is Excellent) and (Market\_value is Low) then (House is Medium)
12. If (Location is Excellent) and (Market\_value is Medium) then (House is High)
13. If (Location is Excellent) and (Market\_value is High) then (House is Very\_high)
14. If (Location is Excellent) and (Market\_value is Very\_high) then (House is Very\_high)

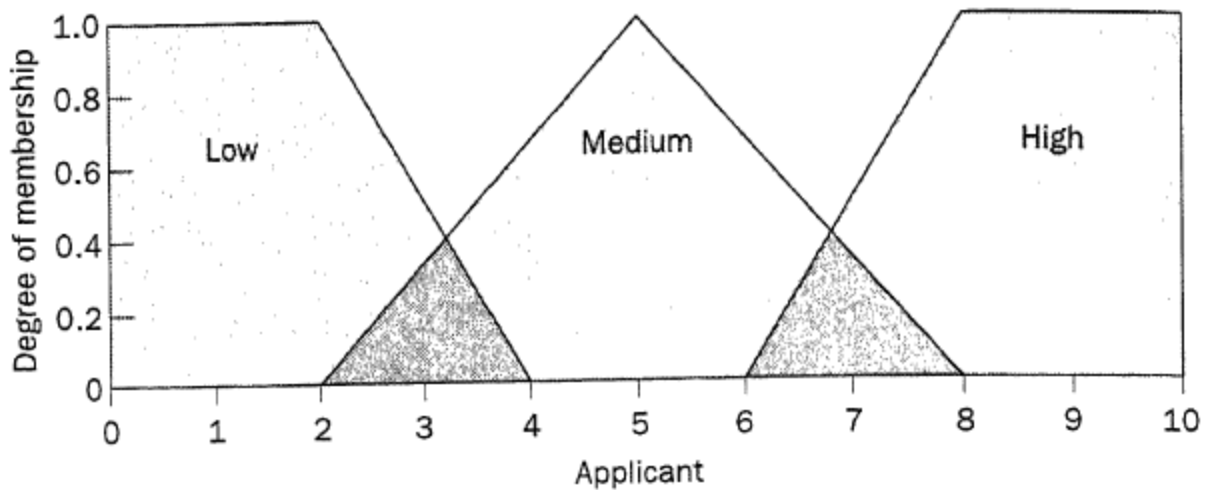
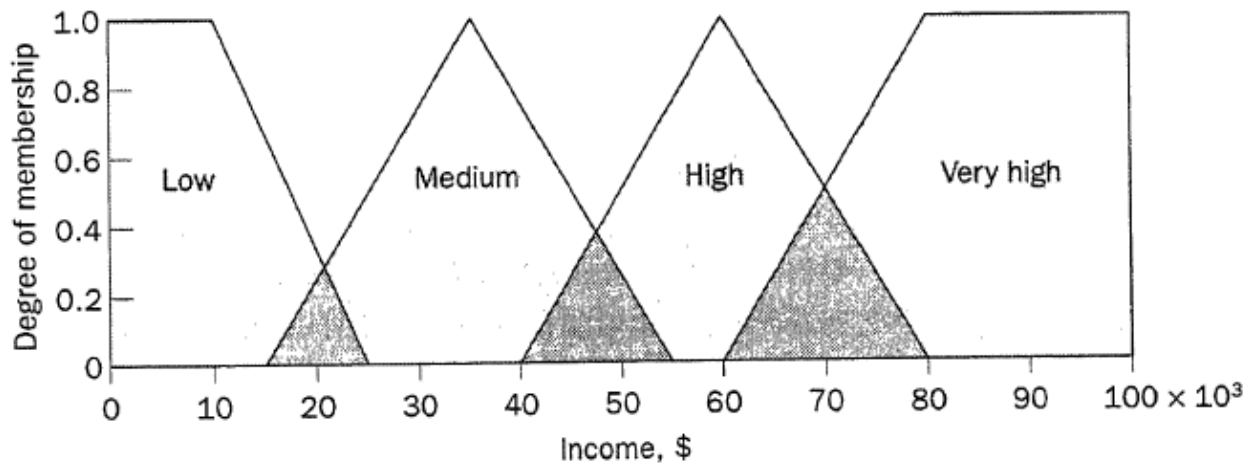
### 2. Applicant Evaluation:

Input 1: Assets (\$)

Input 2: Income (\$)

Output: Applicant





#### Rule Base 2: Applicant Evaluation

1. If (Asset is Low) and (Income is Low) then (Applicant is Low)
2. If (Asset is Low) and (Income is Medium) then (Applicant is Low)
3. If (Asset is Low) and (Income is High) then (Applicant is Medium)
4. If (Asset is Low) and (Income is Very\_high) then (Applicant is High)
5. If (Asset is Medium) and (Income is Low) then (Applicant is Low)
6. If (Asset is Medium) and (Income is Medium) then (Applicant is Medium)
7. If (Asset is Medium) and (Income is High) then (Applicant is High)
8. If (Asset is Medium) and (Income is Very\_high) then (Applicant is High)
9. If (Asset is High) and (Income is Low) then (Applicant is Medium)
10. If (Asset is High) and (Income is Medium) then (Applicant is Medium)
11. If (Asset is High) and (Income is High) then (Applicant is High)
12. If (Asset is High) and (Income is Very\_high) then (Applicant is High)

### 3. Credit Evaluation:

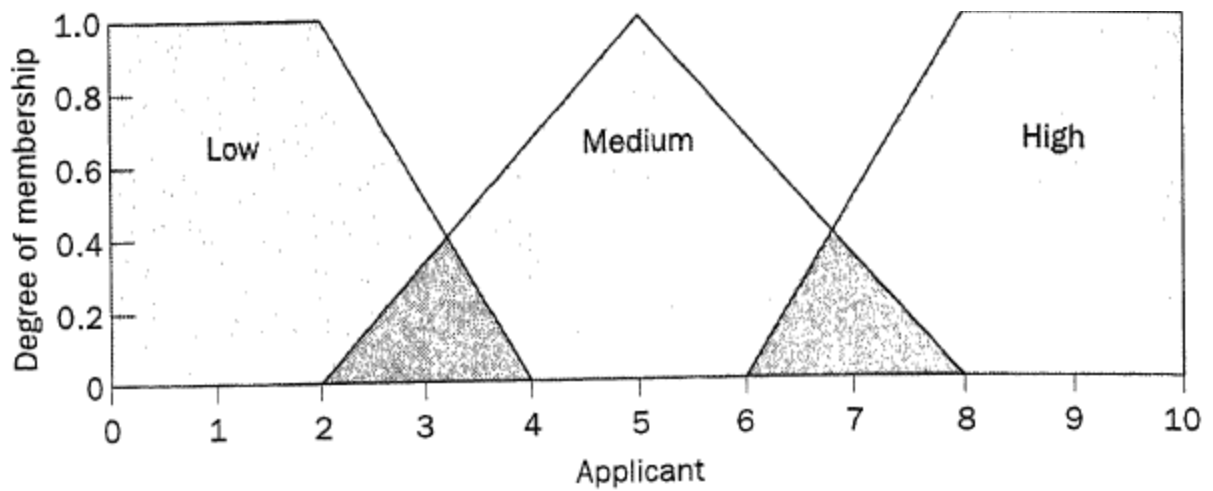
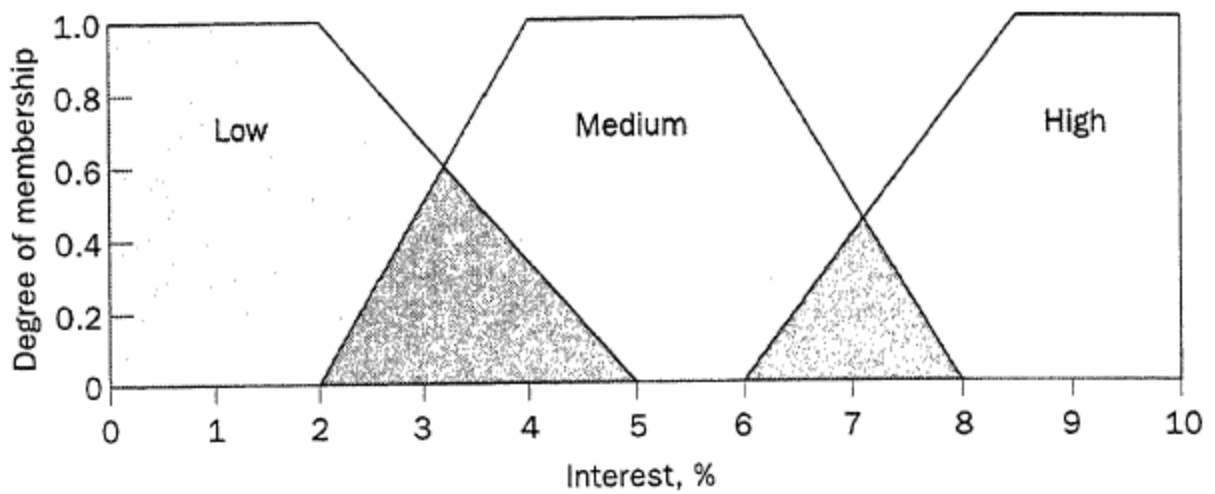
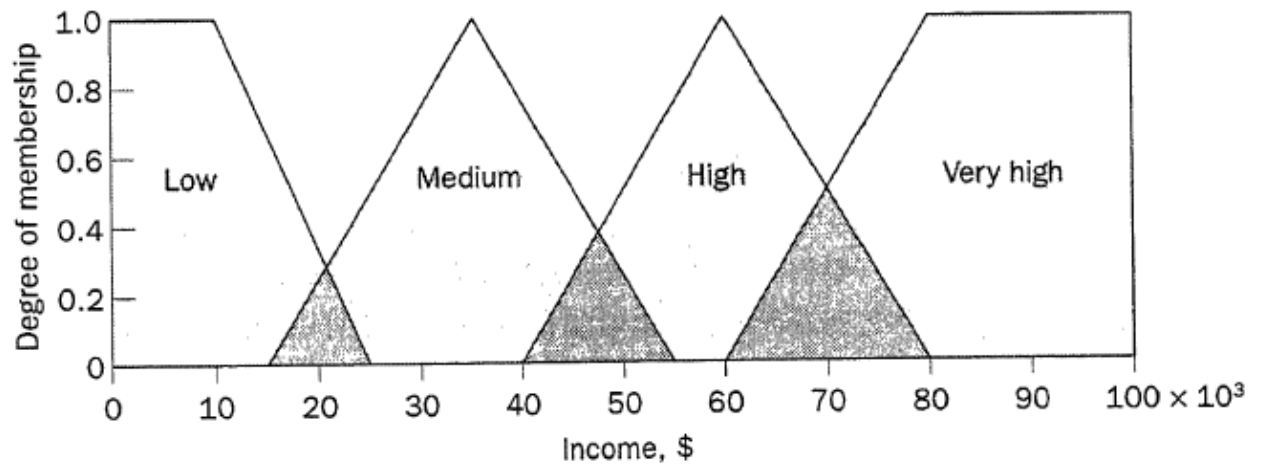
Input 1: Income

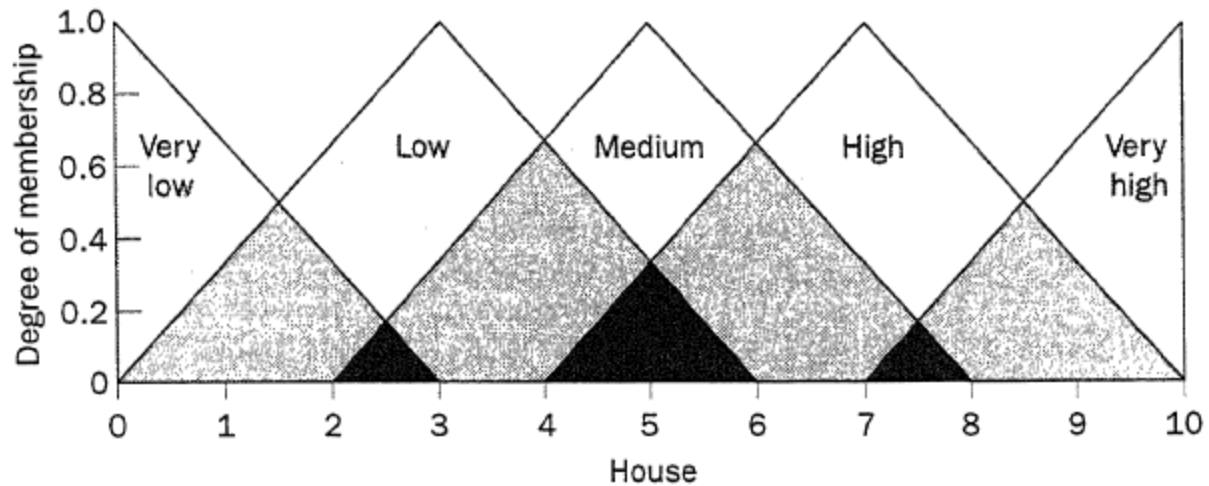
Input 2: Interest

Input 3: Applicant

Input 4: House

Output: Credit





### Rule Base 3: Credit Evaluation

1. If (Income is Low) and (Interest is Medium) then (Credit is Very\_low)
2. If (Income is Low) and (Interest is High) then (Credit is Very\_low)
3. If (Income is Medium) and (Interest is High) then (Credit is Low)
4. If (Applicant is Low) then (Credit is Very\_low)
5. If (House is Very\_low) then (Credit is Very\_low)
6. If (Applicant is Medium) and (House is Very\_low) then (Credit is Low)
7. If (Applicant is Medium) and (House is Low) then (Credit is Low)
8. If (Applicant is Medium) and (House is Medium) then (Credit is Medium)
9. If (Applicant is Medium) and (House is High) then (Credit is High)
10. If (Applicant is Medium) and (House is Very\_high) then (Credit is High)
11. If (Applicant is High) and (House is Very\_low) then (Credit is Low)
12. If (Applicant is High) and (House is Low) then (Credit is Medium)
13. If (Applicant is High) and (House is Medium) then (Credit is High)
14. If (Applicant is High) and (House is High) then (Credit is High)
15. If (Applicant is High) and (House is Very\_high) then (Credit is Very\_high)