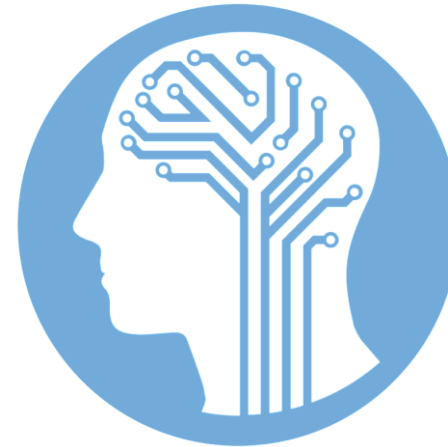




BENNETT
UNIVERSITY
TIMES OF INDIA GROUP

Soft Computing

(Lec - 02)



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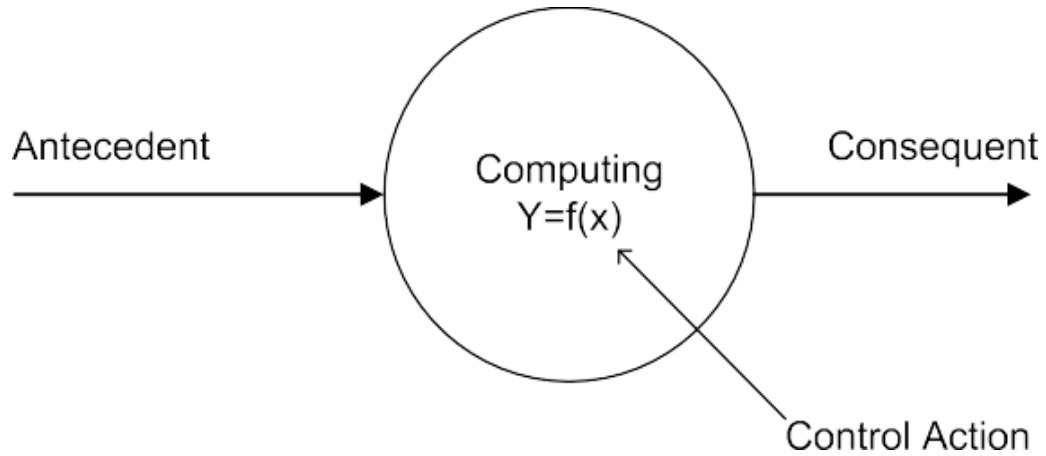


Plan

- 1. Concept of computation**
- 2. Introduction to Hard Computing**
- 3. Introduction to Soft Computing**
- 4. Knowledge check**

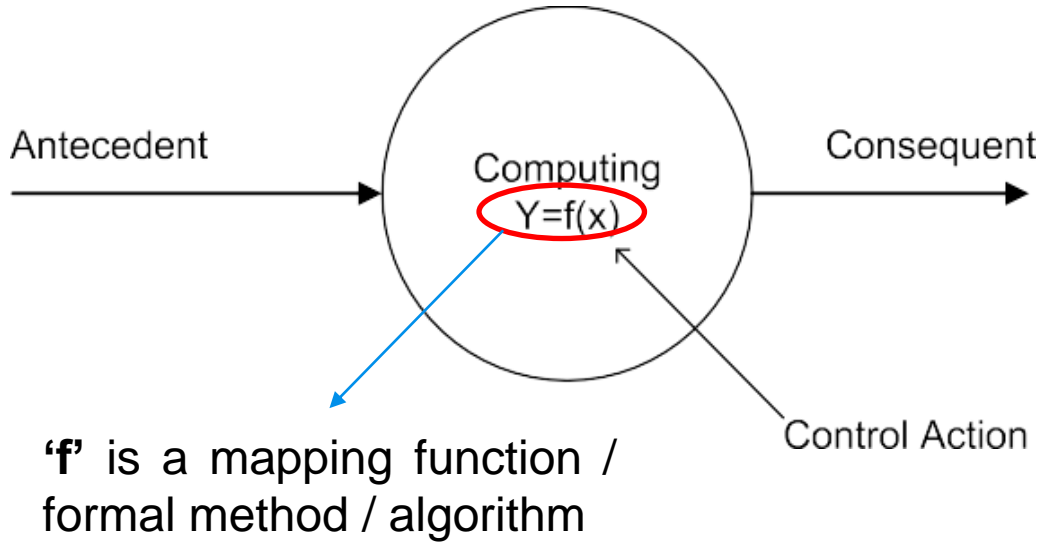


Concept of Computation



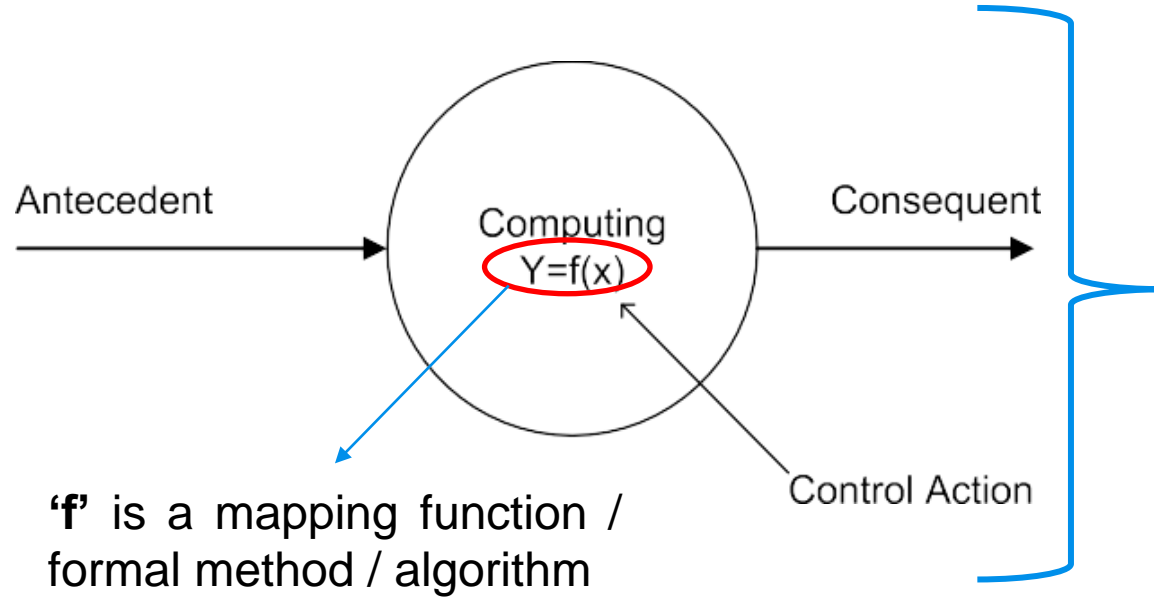


Concept of Computation





Concept of Computation



- Should provide **precise solution**
- Control action should be **unambiguous** and **accurate**
- Suitable for problems which are easy to **model mathematically**



Hard Computing

- ❑ Introduced in **1996**, by **Lotif Aliasker Zadeh (LAZ)**
- ❑ Any Computing is termed as Hard computing if:
 - ❑ guarantees precise result,
 - ❑ control action is unambiguous, and
 - ❑ control action is mathematically modelled or formally defined.

Example: solving numerical problems, searching and sorting algorithms, etc.



Soft Computing

- ❑ Introduced by **LAZ**
- ❑ Collection of methodologies that aims to provide **tolerance for imprecision** and **uncertainty** to achieve tractability, robustness, and low-cost solution.



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Results obtained by soft computing techniques are not necessarily to be precise

If the problem is solved several times, then it may produce different result different times



Soft Computing

- ❑ Introduced by **LAZ**
- ❑ Collection of methodologies that aims to provide **tolerance for imprecision** and **uncertainty** to achieve tractability, **robustness**, and **low-cost** solution.

If Hard-computing followed, then computationally expensive. Here it is cheap.

It can tackle any sort of input including noise etc.



Soft Computing

- Results not necessarily be precise
- Steps to be followed not necessarily be certain or unambiguous
- Results obtained not necessarily be same always



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How this
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How this
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1. Fuzzy logic
2. Evolutionary computing
3. Neural computing



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Role model
is
Human brain



Characteristics of Soft Computing

- Does not require any mathematical model.
- May not yield precise solution
- Algorithms are adaptive
- Use some biological inspired methodologies such as genetics, evolution, ant's behavior, particle swarm, human nervous system, etc.



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The way different natural phenomenon works for us... if we follow the same method to solve our own problem... this is exactly the way soft computing works....





Few Examples

- How a **doctor** treats his **patient**?


- 
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- 
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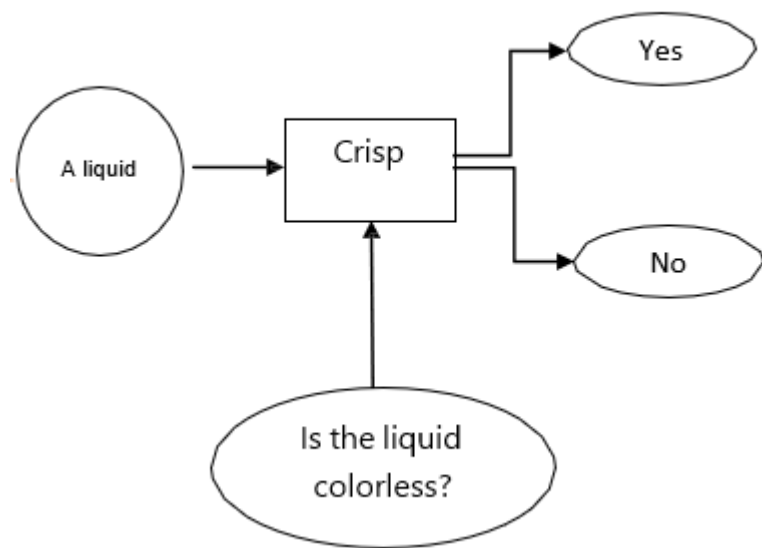
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- How a **doctor** treats his **patient**?
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 - Doctor find the symptoms of diseases.
 - Doctor prescribed tests and medicines.

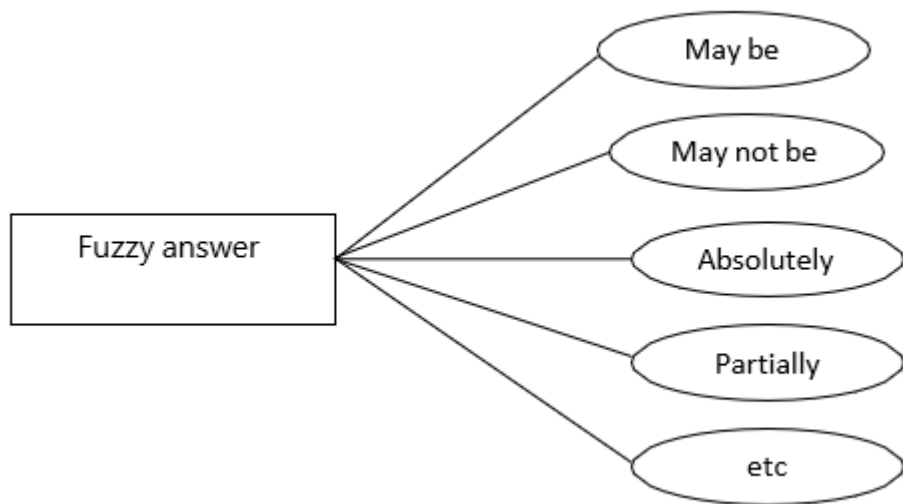
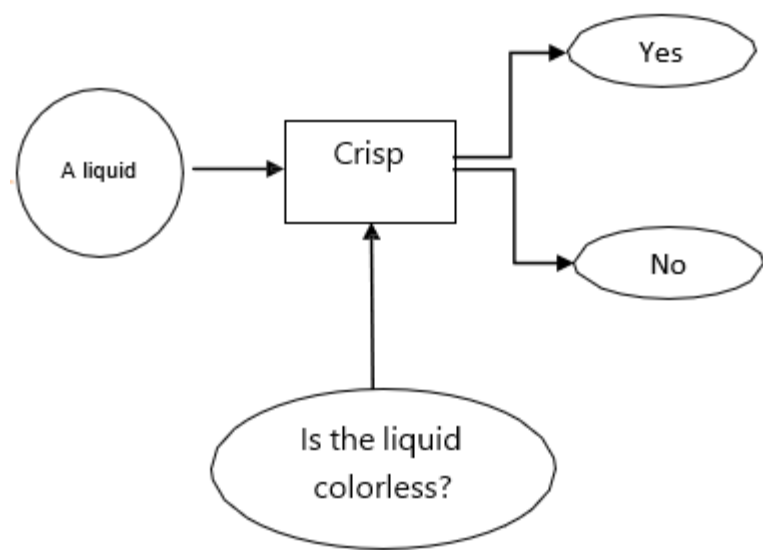
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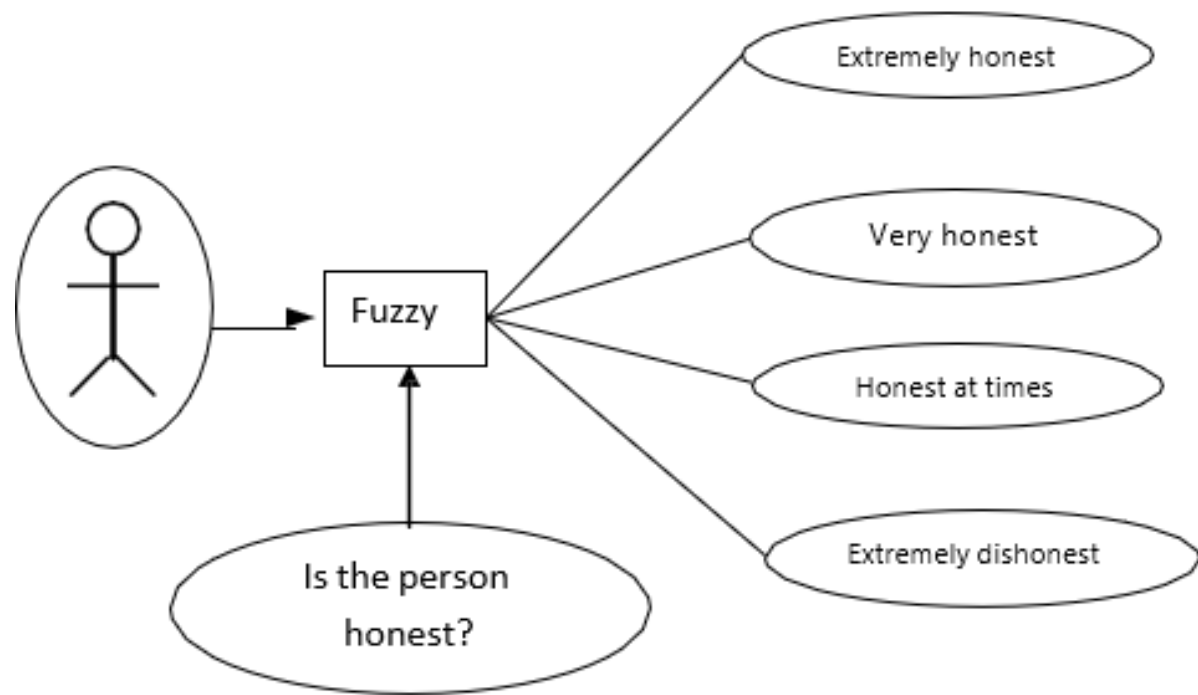
- How a **doctor** treats his **patient**?
 - Doctor asks the patient about suffering.
 - Doctor find the symptoms of diseases.
 - Doctor prescribed tests and medicines.
- This is exactly the way **Fuzzy Logic** works.
 - Symptoms are correlated with diseases with uncertainty .
 - Doctor prescribes tests/medicines **fuzzily**.

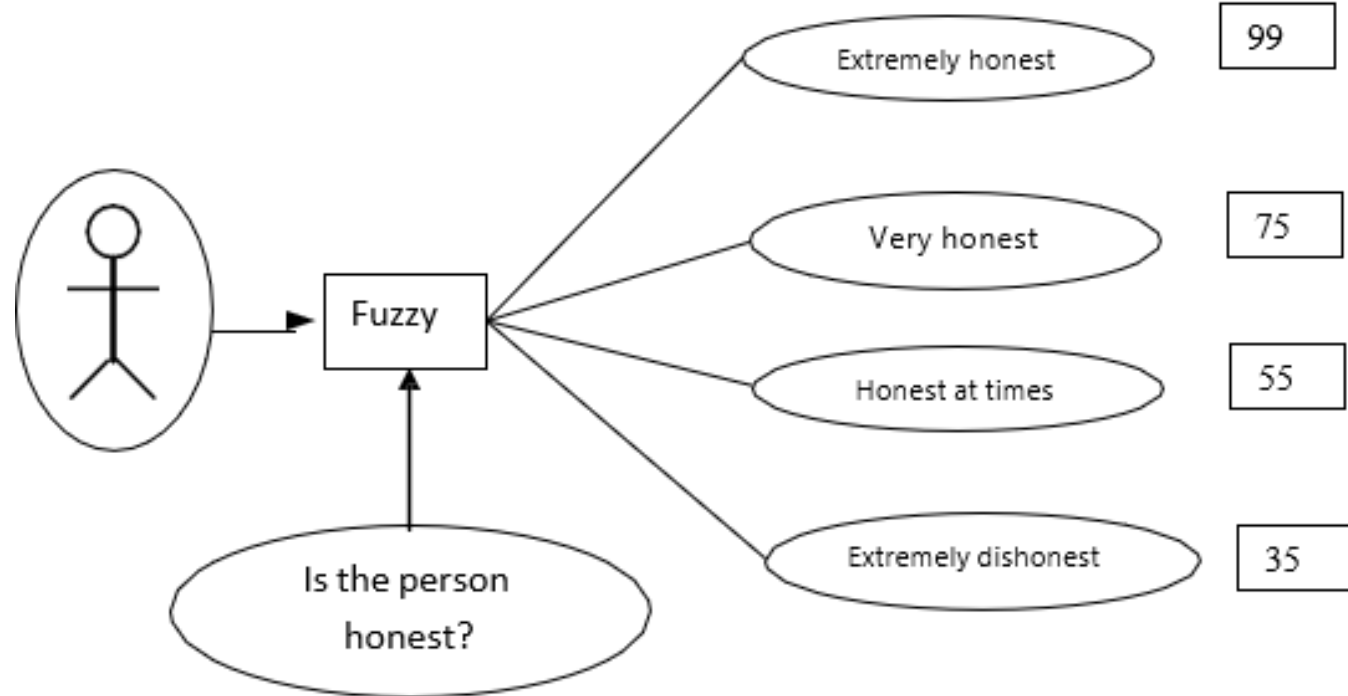
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 - It starts with a population (random).
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 - It starts with a population (random).
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- **Genetic algorithm** is based on this natural phenomena.
 - Population is synonymous to solutions.











Thanks!

Any questions?

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