Business Intelligence and Business Analytics:

Business Intelligence (BI)	Business Analytics (BA)
Historical data analysis to understand past performance and identify trends.	Use of data analytics to make data-driven decisions for future actions.
Limited to the analysis of structured data from internal systems.	Broader scope including both structured and unstructured data from both internal and external sources.
Internal systems such as ERP, CRM, SCM, etc.	Internal and external sources including social media, customer feedback, market data, etc.
Focused on descriptive analytics, providing insights into what happened in the past.	Includes descriptive, predictive, and prescriptive analytics to gain insights and take actions based on data.
Traditional BI tools such as dashboards, reporting, and OLAP.	Advanced analytics tools such as data mining, machine learning, and predictive modelling.
Primarily used by managers and executives to monitor and analyse performance.	Used by managers, executives, and data scientists to make data-driven decisions across all levels of the organization.
Help organizations make better decisions by providing historical data analysis and insights.	Help organizations make data-driven decisions for future actions to improve business performance and achieve strategic goals.

AI Models:

Let us learn about semiotic models and statistical models in brief.

Semiotic Models	Statistical Models
Semiotic models focus on the interpretation and representation of meaning, symbols, and signs in a given context.	Statistical models aim to analyse and understand patterns, relationships, and trends within data using mathematical techniques.
Semiotic models are based on semiotics, which is the study of signs, symbols, and their interpretation in communication.	Statistical models are based on mathematical and probabilistic principles, utilizing statistical methods for analysis and modelling.
Semiotic models can incorporate a wide range of data types, including textual, visual & cultural data.	Statistical models rely on numerical data, as they are designed to perform quantitative analysis & inference.
Semiotic models focus on understanding the meaning and context of symbols, signs, and communication in a given domain.	Statistical models provide insights through numerical analysis, quantifying relationships and making predictions based on data.
Semiotic models are commonly used in areas such as linguistics, literature, cultural studies, and visual arts.	Statistical models find application across various domains, including finance, healthcare, marketing, and social sciences.
Roland Barthes' semiotic analysis, Peircean semiotics, symbolic interactionism, visual semiotics.	Linear regression, logistic regression, decision trees, neural networks, clustering algorithms, time series analysis.

What is Fuzzy Logic?

Fuzzy Logic (FL) is a method of reasoning that resembles human reasoning. The approach of FL imitates the way of decision making in humans that involves all intermediate possibilities between digital values YES and NO.

The conventional logic block that a computer can understand takes precise input and produces a definite output as TRUE or FALSE, which is equivalent to human's YES or NO.

The inventor of fuzzy logic, Lotfi Zadeh, observed that unlike computers, the human decision making includes a range of possibilities between YES and NO, such as –

CERTAINLY YES
POSSIBLY YES
CANNOT SAY
POSSIBLY NO
CERTAINLY NO

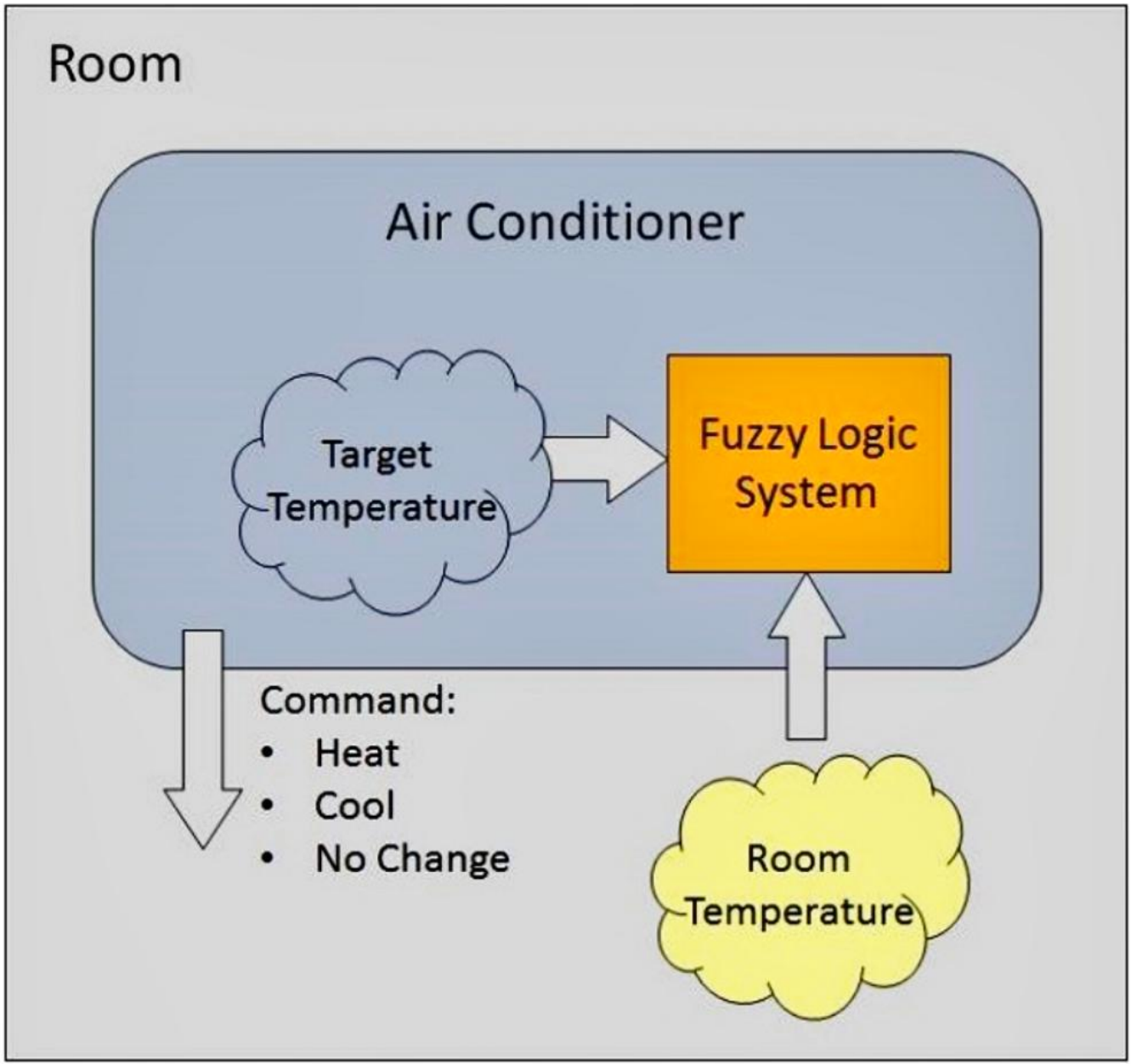
The fuzzy logic works on the levels of possibilities of input to achieve the definite output.

Implementation

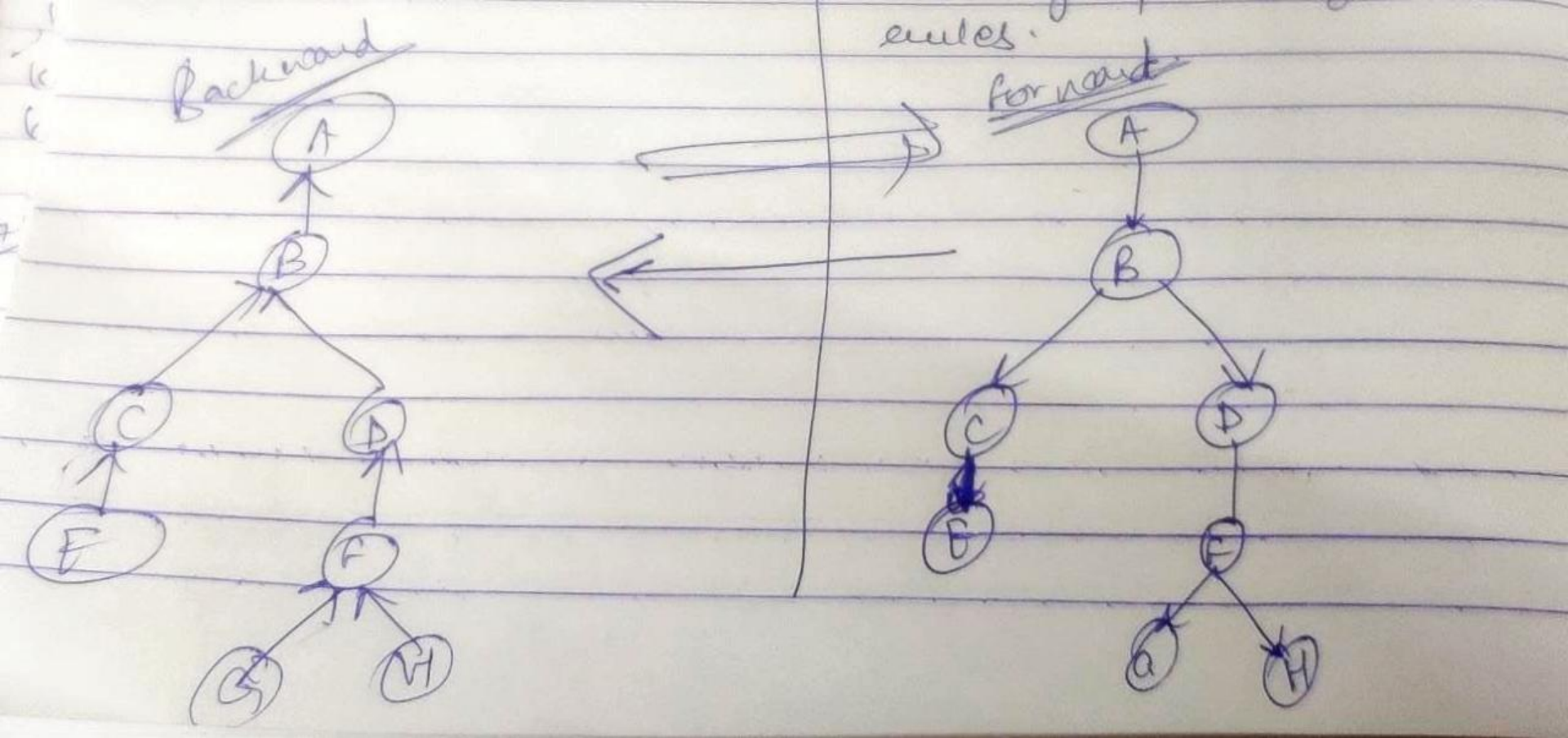
- It can be implemented in systems with various sizes and capabilities ranging from small micro-controllers to large, networked, workstation-based control systems.
- It can be implemented in hardware, software, or a combination of both.

Example of a Fuzzy Logic System

Let us consider an air conditioning system with 5-level fuzzy logic system. This system adjusts the temperature of air conditioner by comparing the room temperature and the target temperature value.



rules.

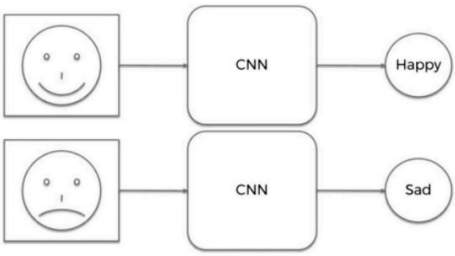


Convolutional Neural Network:

A convolutional neural network (CNN) is a type of deep neural network that is designed to process and analyse images and other multidimensional data. CNNs are widely used in computer vision applications, such as image recognition, object detection, and facial recognition.

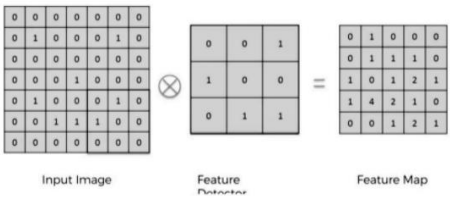
Some of the key features of a CNN include:

- Convolutional layers that perform local feature extraction using filters.
- Pooling layers that down sample the output and reduce the dimensionality of the data.
- Activation functions, such as ReLU, that introduce non-linearity into the model.
- Dropout and regularization techniques to prevent overfitting.
- Backpropagation algorithm to optimize the weights of the network during training.

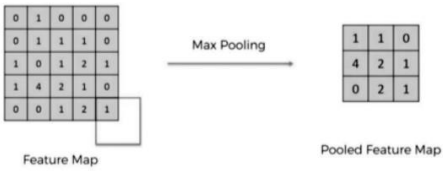


Here are the steps of creating a CNN model.

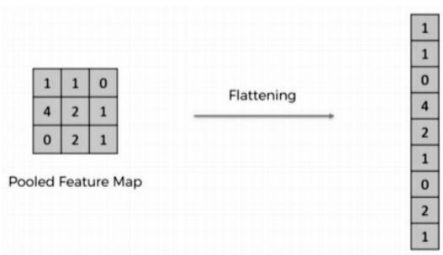
Convolution:



Max Pooling:



Flattening:



Full Connection: