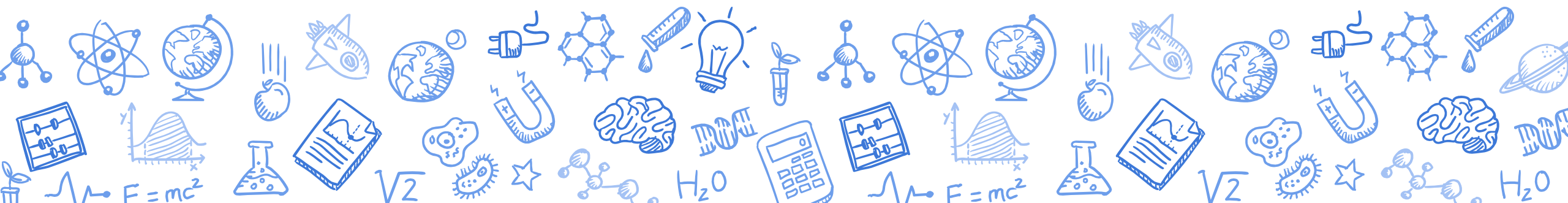


AN INFORMAL INTRODUCTION TO ARTIFICIAL INTELLIGENCE

by

Parijat Chakraborty



Definition of AI :-

Artificial intelligence refers to the technology by which machines simulates human intelligence.

Emergence of AI :-

- Data has grown at a rapid pace over the past few years, and will continue to grow in gigantic volume in the future.
- This explosion of data has given rise to a new economy, and there's a constant battle for the ownership of data between companies to derive benefits from it.
- This rise in data volume has given rise to Big Data.
- Data Science helps analyse these data.
- The science associated with data is going toward a new paradigm.
- Where machines are taught to learn from data and derive a variety of useful insights, giving rise to Artificial intelligence.

AI in real life :-

Examples :

- Self driving car.
- Apple Siri.
- Google's AlphaGo.
- Chess.
- Concierge robot from IBM Watson.

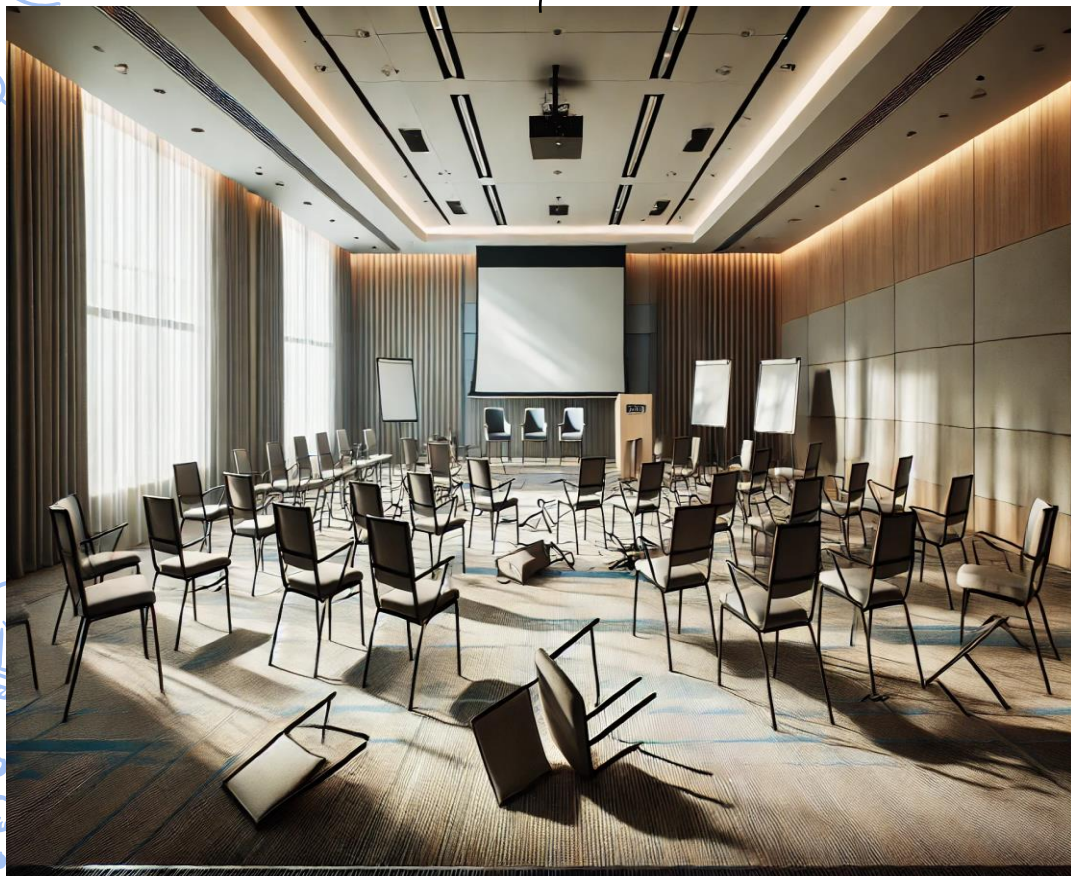
Sci-fi movies with the concept of AI :-

- The Terminator
- Matrix
- Star Trek



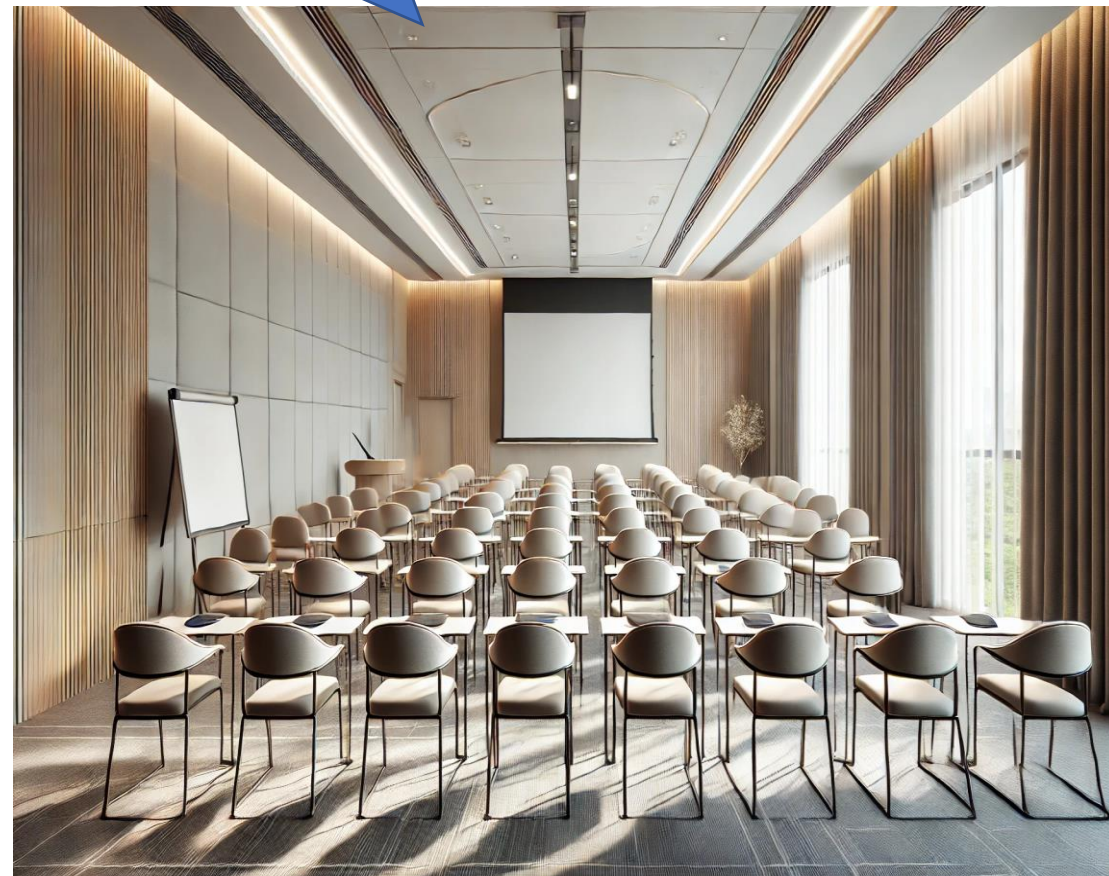
The Thinking Process

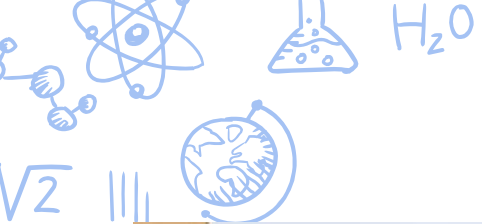
Your Suggestion on Problem Solving



?

?



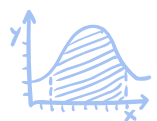


1

2

3

...



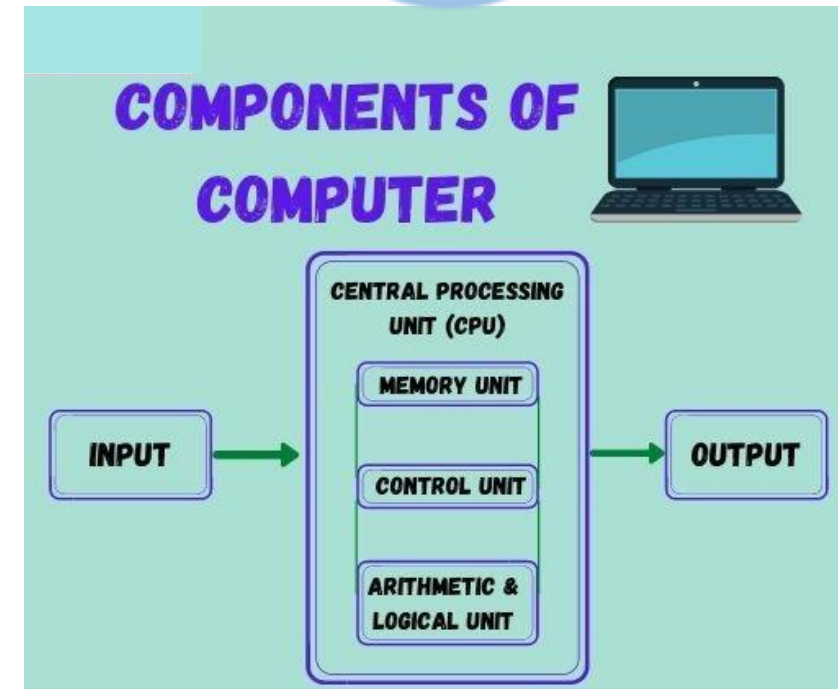
$$E=mc^2$$



What We MAY REQUIRE ?

$$2 + 7 = 9$$

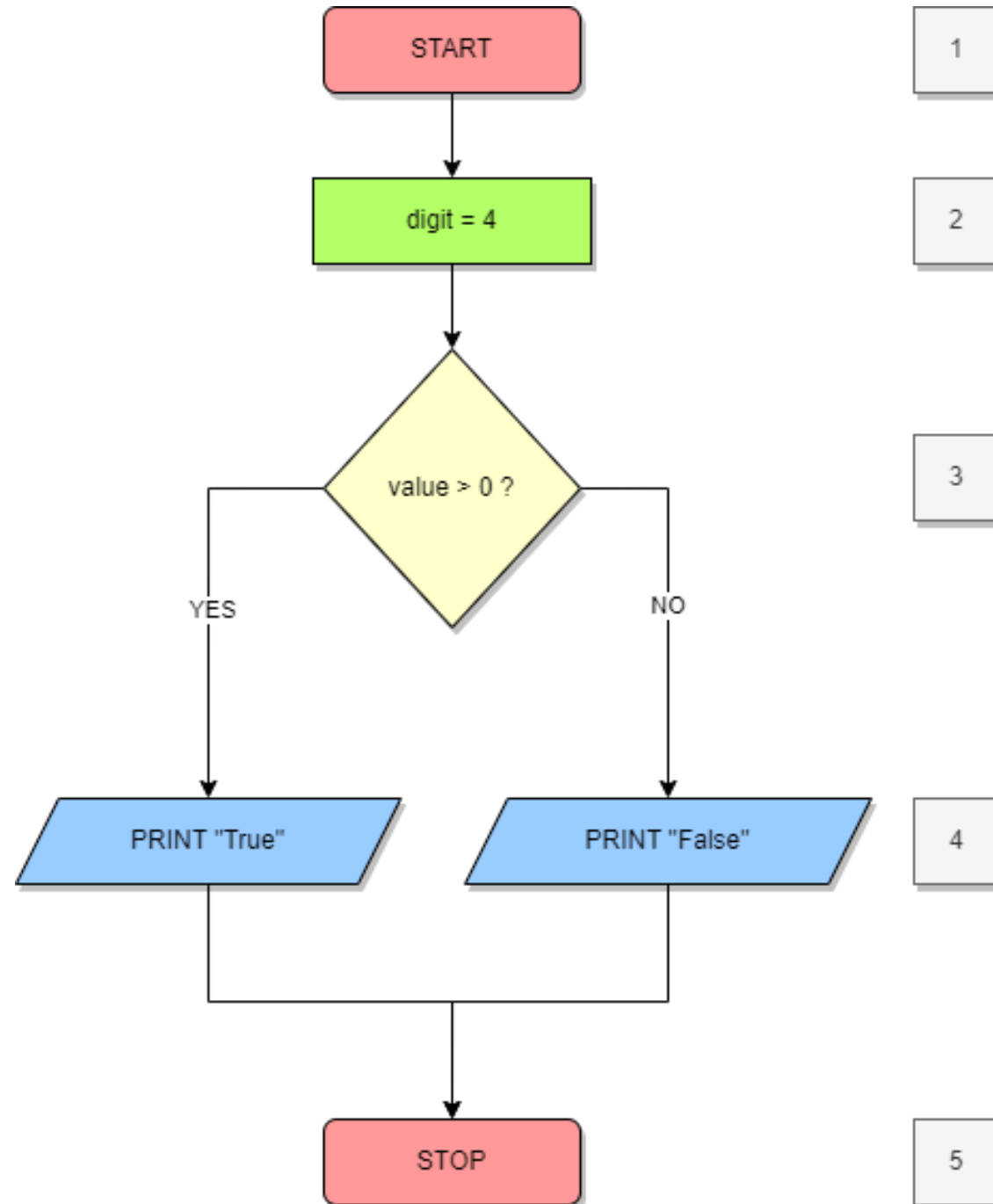
- ✓ INPUT
- ✓ MEMORY
- ✓ LOGIC
- ✓ PROCESSOR
- ✓ OUTPUT



[illegible]

THE FLOW CHART

Is
4
greater
than
0 ?



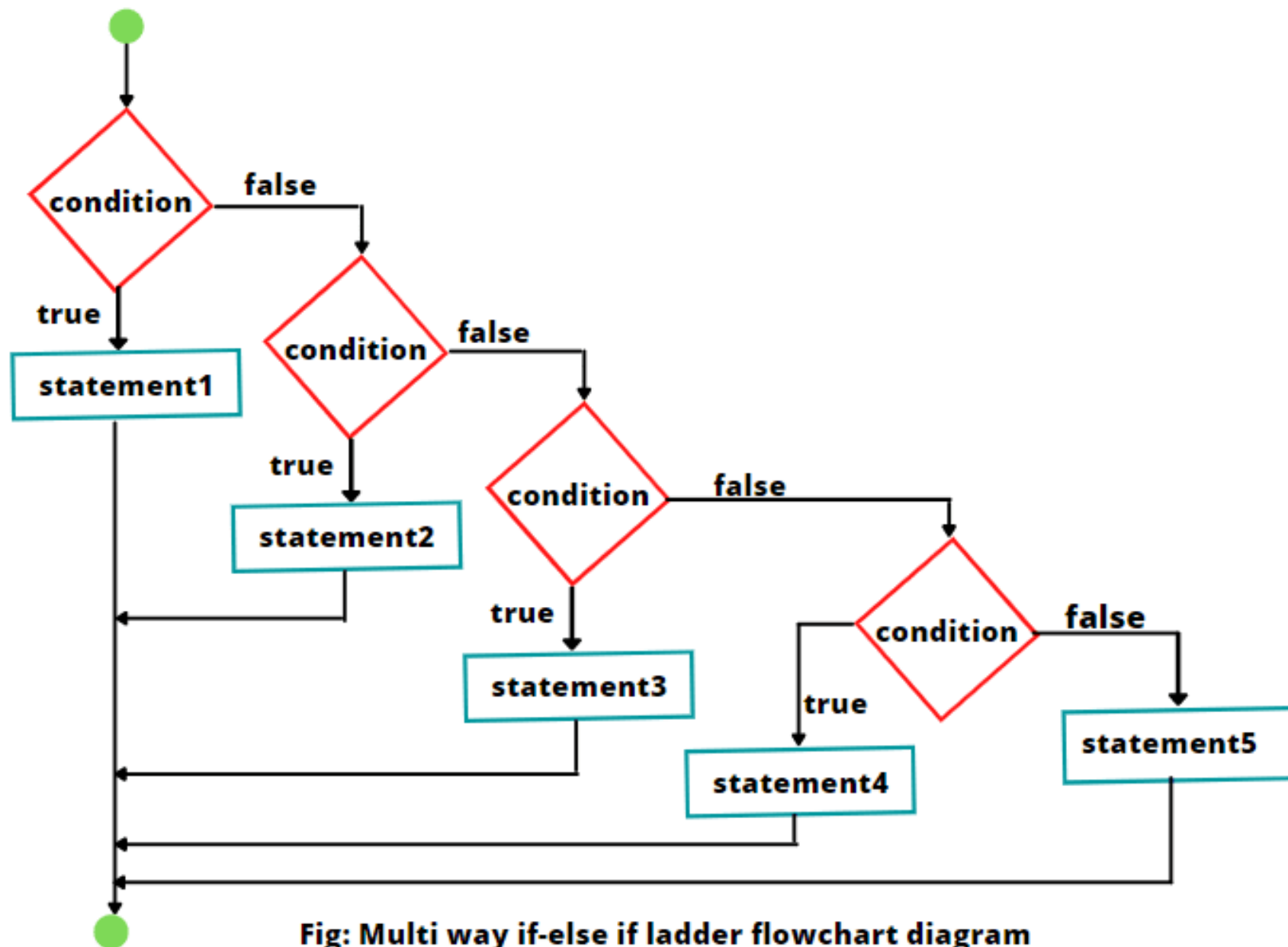
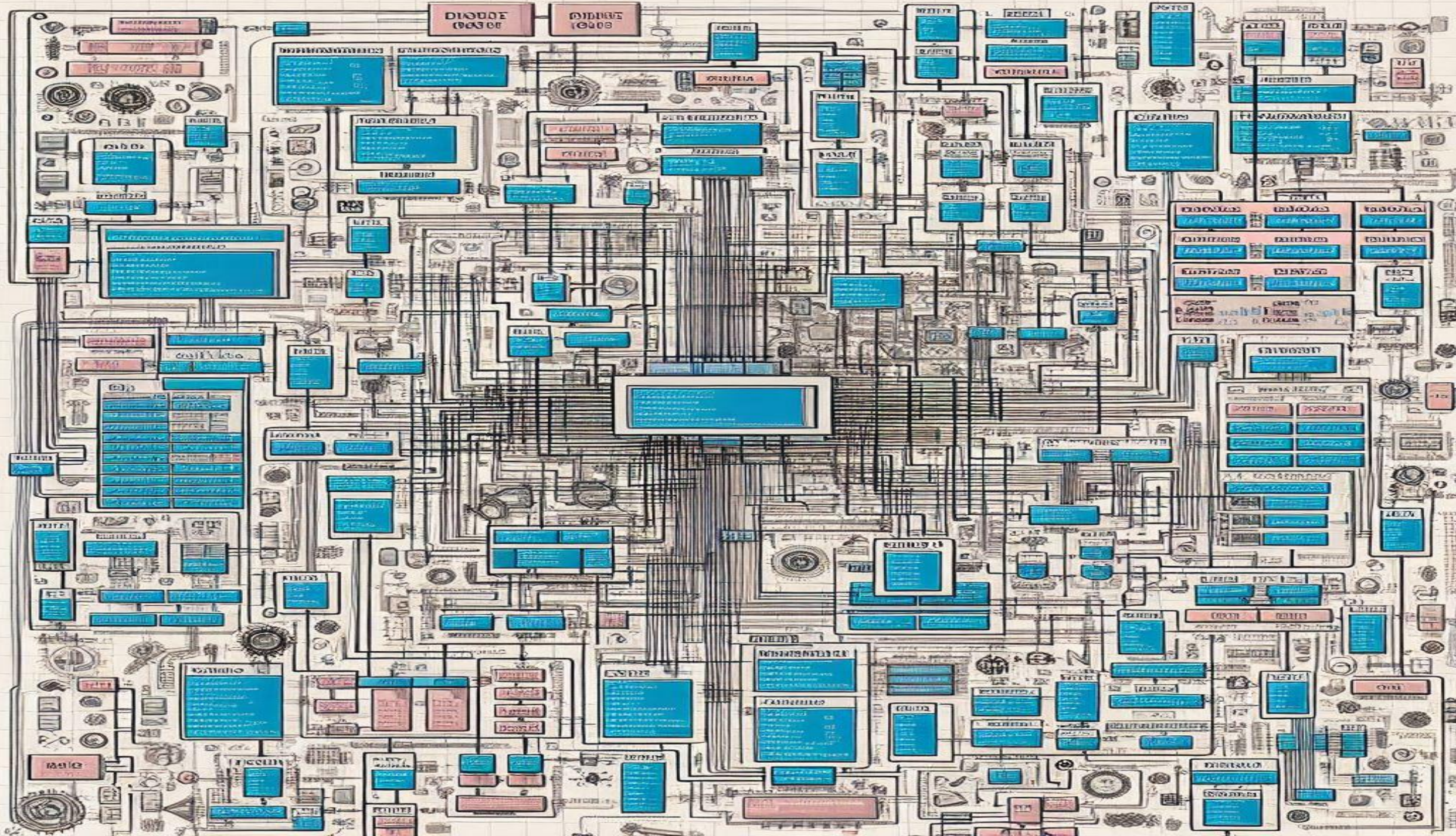
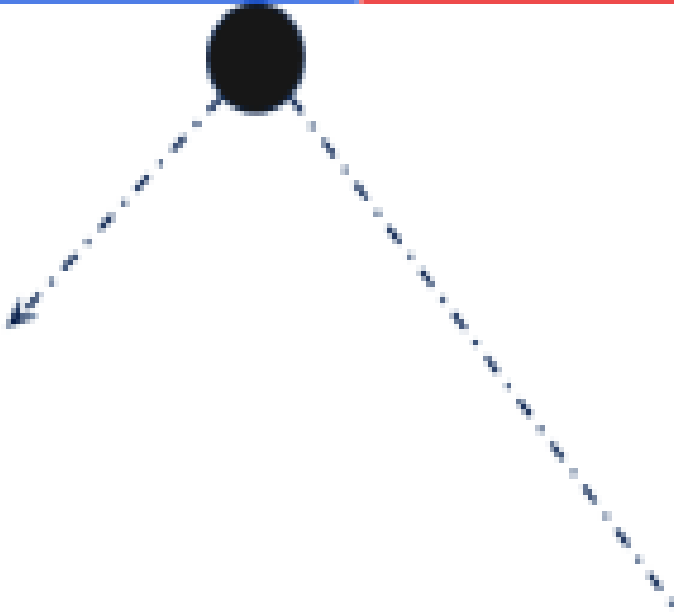


Fig: Multi way if-else if ladder flowchart diagram

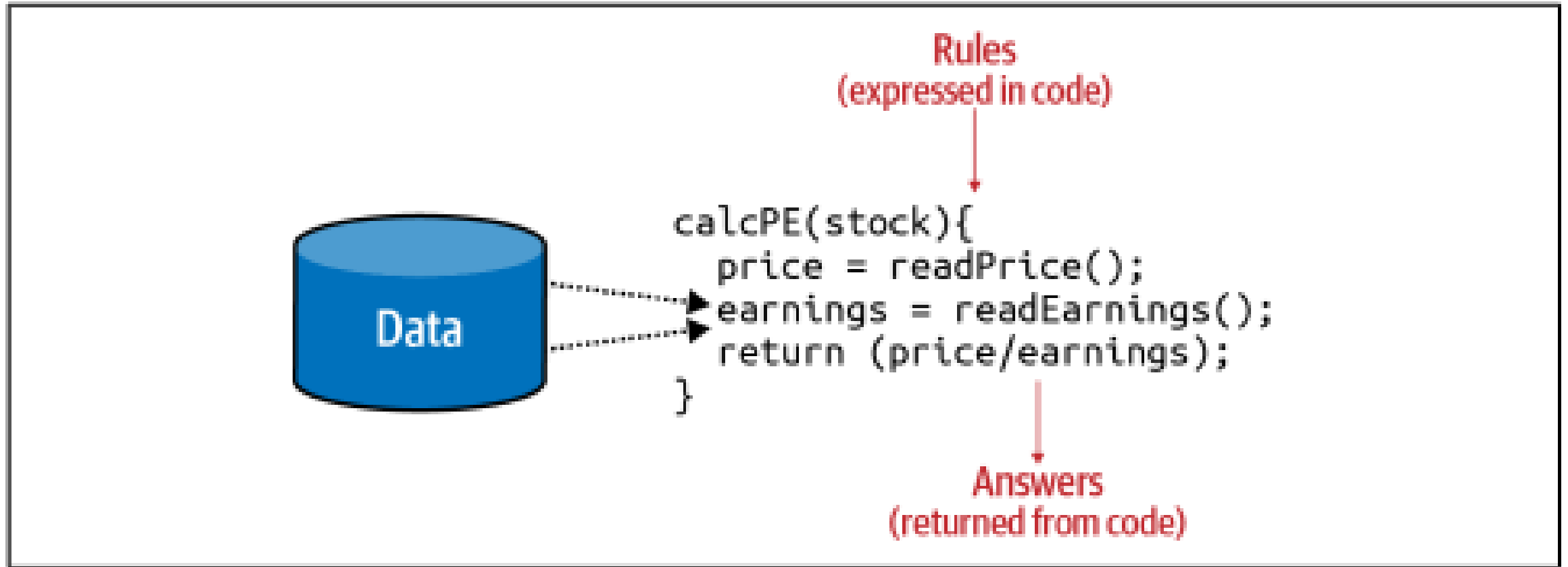


THE Bounce Ball Game

How to Program ?



```
if (ball.collide(brick)){  
    removeBrick();  
    ball.dx = 1.1*(ball.dx);  
    ball.dy = -1*(ball.dy);  
}
```



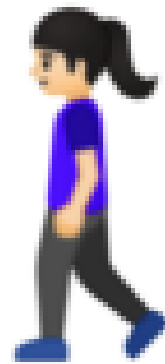
Rule -> Data -> Answer Model



Rule -> Data -> Answer Model

Let us Program a Activity Tracker App for a SmartWatch





```
if(speed<4){  
    status=WALKING;  
}
```




```
if(speed<4){  
    status=WALKING;  
} else {  
    status=RUNNING;  
}
```



```
if(speed<4){  
    status=WALKING;  
} else if(speed<12){  
    status=RUNNING;  
} else {  
    status=BIKING;  
}
```



// ???

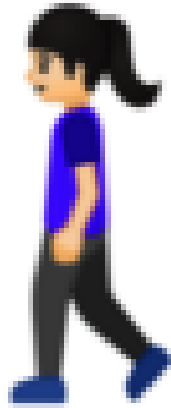
Rule -> Data -> Answer Model



Failed ??

The Paradigm Shift





0101001010100101010
1001010101001011101
0100101010010101001
0101001010100101010

Label = WALKING



1010100101001010101
0101010010010010001
0010011111010101111
1010100100111101011

Label = RUNNING



1001010011111010101
1101010111010101110
1010101111010101011
1111110001111010101

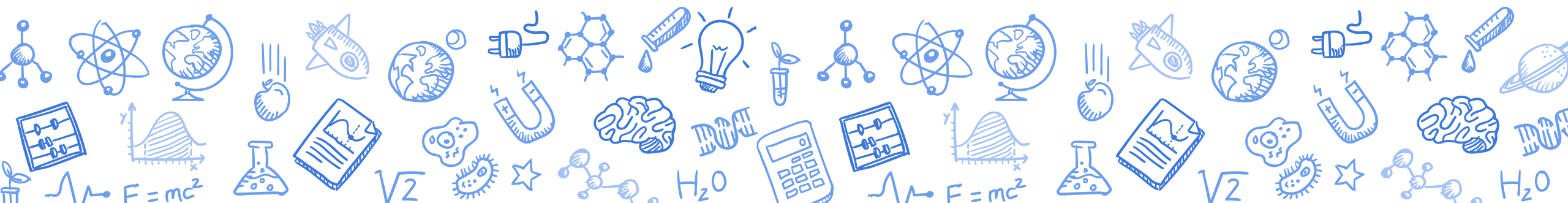
Label = BIKING

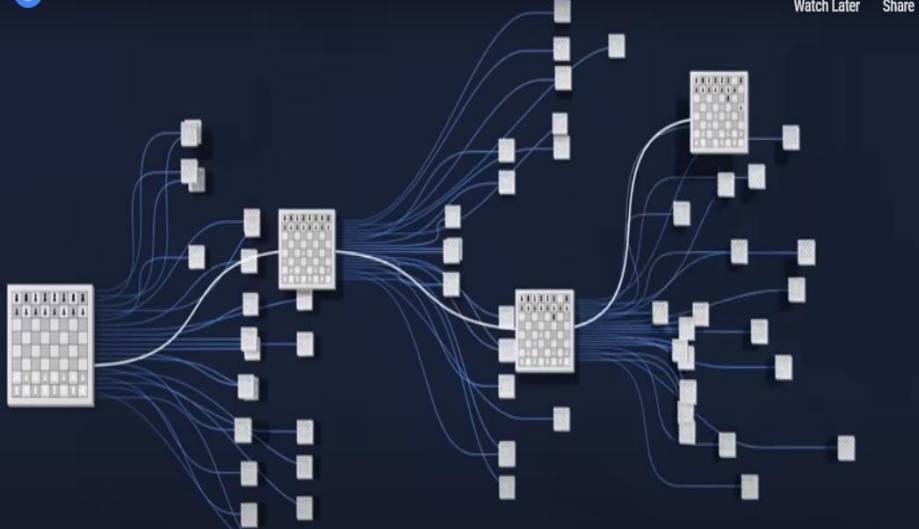


1111111111010011101
0011111010111110101
0101110101010101110
1010101010100111110

Label = GOLFING

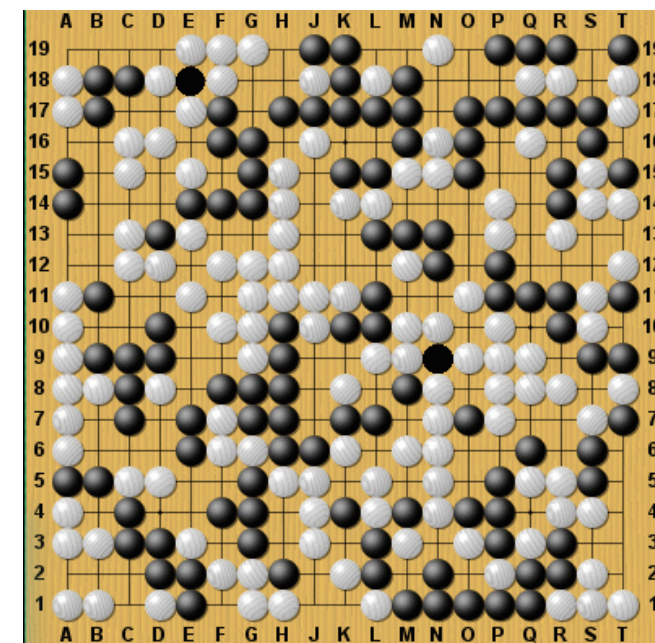
The AI Journey and An Early Success Story





In Chess, Number of Possible Moves
in a Position is about 20

Google DeepMind
AlphaGo



In Go, Number of Possible Moves
in a Position is about 200



Lee Sedol

Lee Sedol ([Korean](#): 이세돌; born 2 March 1983), or **Lee Se-dol**, is a former [South Korean](#) professional [Go player](#) of [9 dan rank](#).^[1]

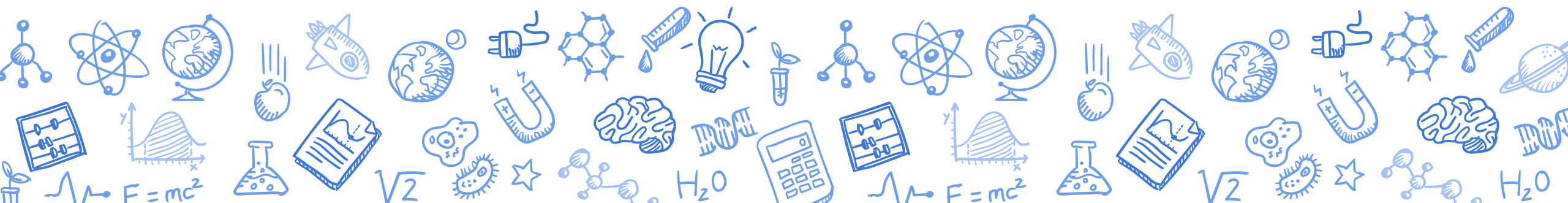
As of February 2016, he ranked second in [international titles](#) (18), behind only [Lee Chang-ho](#) (21).

His nickname is "The Strong Stone" ("Ssen-dol")



Game	Date	Black	White	Result	Moves
1	9 March 2016	Lee Sedol	AlphaGo	Lee Sedol resigned	186 Game 1 ↗
2	10 March 2016	AlphaGo	Lee Sedol	Lee Sedol resigned	211 Game 2 ↗
3	12 March 2016	Lee Sedol	AlphaGo	Lee Sedol resigned	176 Game 3 ↗
4	13 March 2016	AlphaGo	Lee Sedol	AlphaGo resigned	180 Game 4 ↗
5	15 March 2016	Lee Sedol ^[note 1]	AlphaGo	Lee Sedol resigned	280 Game 5 ↗
Result: AlphaGo 4 – 1 Lee Sedol					

AI, ML and Data Science



Relationship between AI, ML and Data science :-

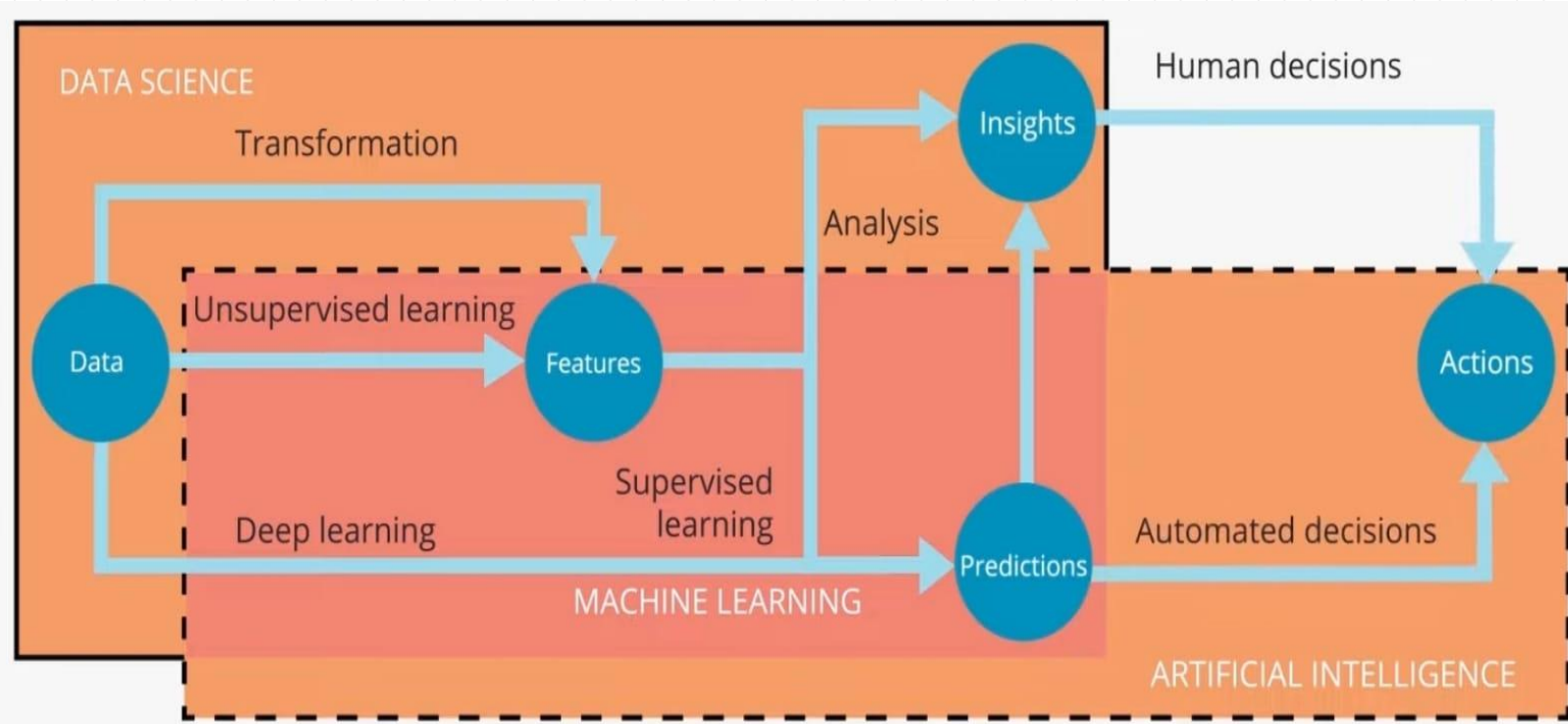
Even though these terms AI, ML and data science fall under same domain, they have specific applications and meanings.

AI replicates or mimics human intelligence.

Machine learning provide systems the ability to automatically learn and improve from the experiences without being explicitly programmed.

Data Science is an umbrella term that encompasses data analytics, data mining, machine learning and artificial intelligence and several other related disciplines.

Let's look at the flow diagram and try to understand the relationship between AI, ML and data science -



Deep learning is a subfield of machine learning involved with algorithms and uses artificial neural networks which are modelled on the structure and performance of the human brain.