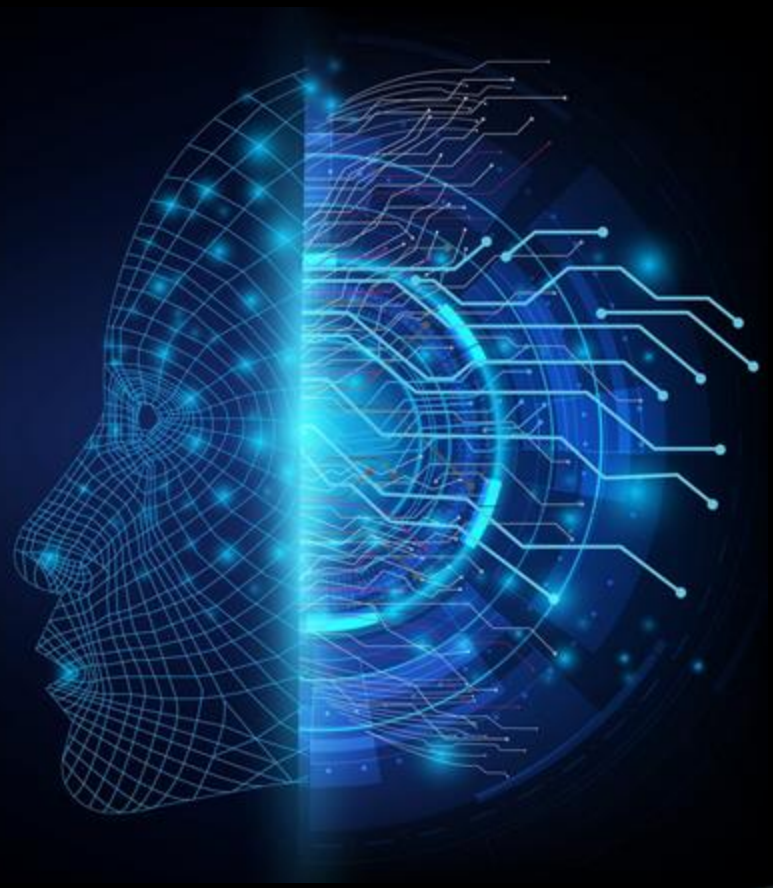
AI-ML

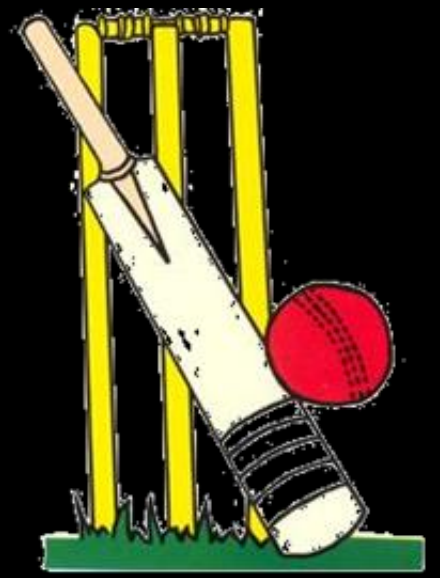
Why & What



AGENDA

- Why AI/ML
- What is what?
  - Descriptive Vs Predictive Vs Prescriptive Vs Advanced Analytics
  - Big Data Vs AI
  - AI V ML Vs DS
- What is Deep Learning
- Predictive Modeling: Regression Vs Classification
- Natural Language Processing (NLP)
- Computer Vision
- Recommender Systems

CRICKET



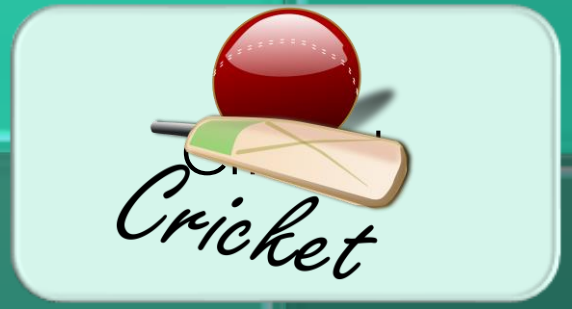
CRICKET

Match related

- Toss, Venue, Weather
- 1st Batting
- Runs Scored
- Wickets Taken

Team

- # of Matches Played / Won
- Match points
- Total Runs

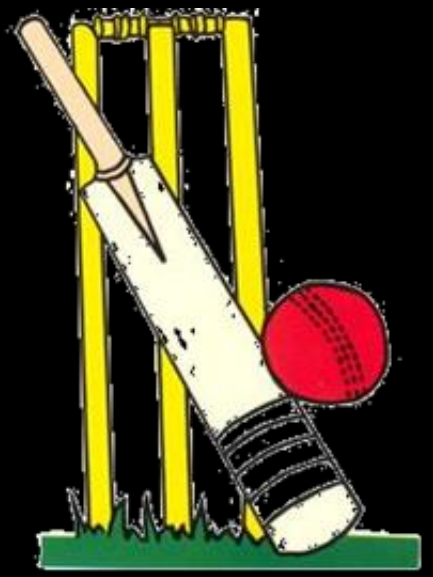


Batsman

- Left hand / Right hand
- Opener, Middle-order
- Hitter

Bowler

- Pacer, Spinner
- Speed
- Left hand / Right hand
- Inswinger, Outswinger, Yarker,
- Leg / off / Googly



CRICKET STATS..

Year: 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013

Vs. Country: Australia | Bangladesh | England | New Zealand | Pakistan | South Africa | Sri Lanka | West Indies | Zimbabwe

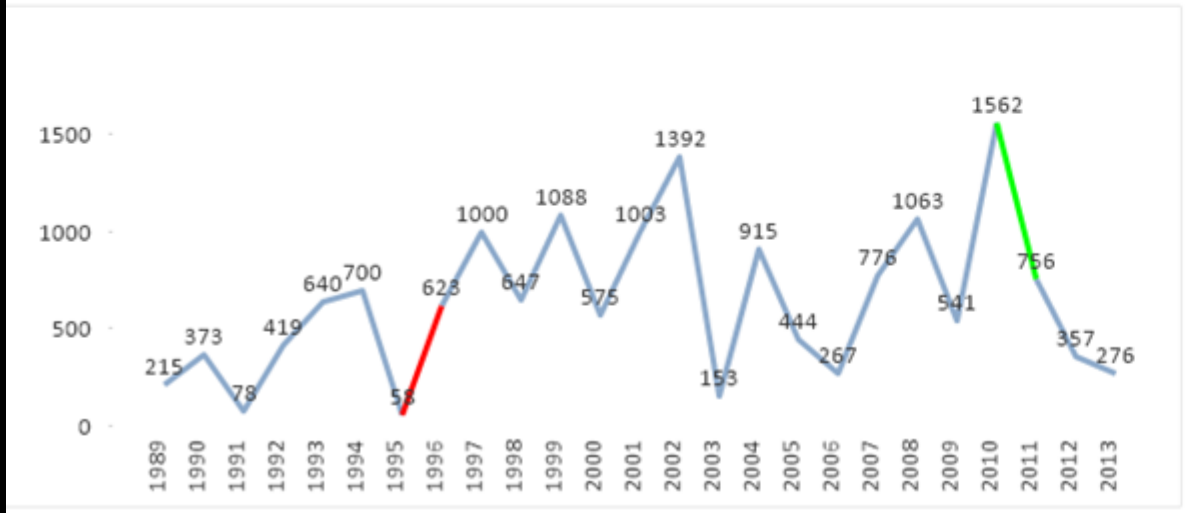
Current Selections

Matches	Runs	200s	100s	50s	Average
200	15921	6	51	68	53.79

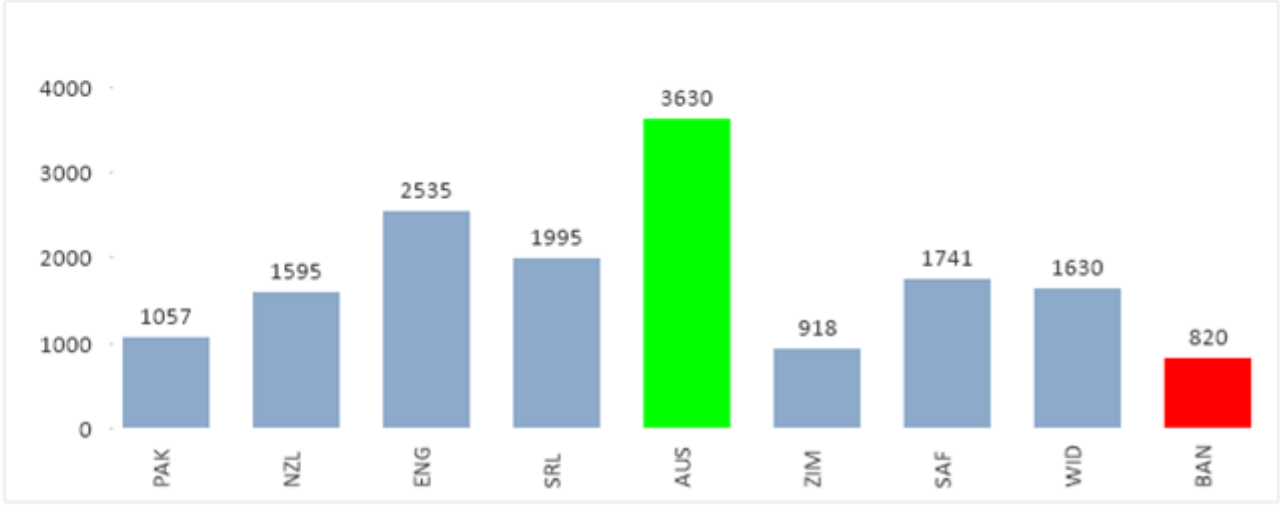
Sachin Ramesh Tendulkar
Date of Birth: April 24, 1973
Batting: Right handed

Sachin! Sachin! Sachin

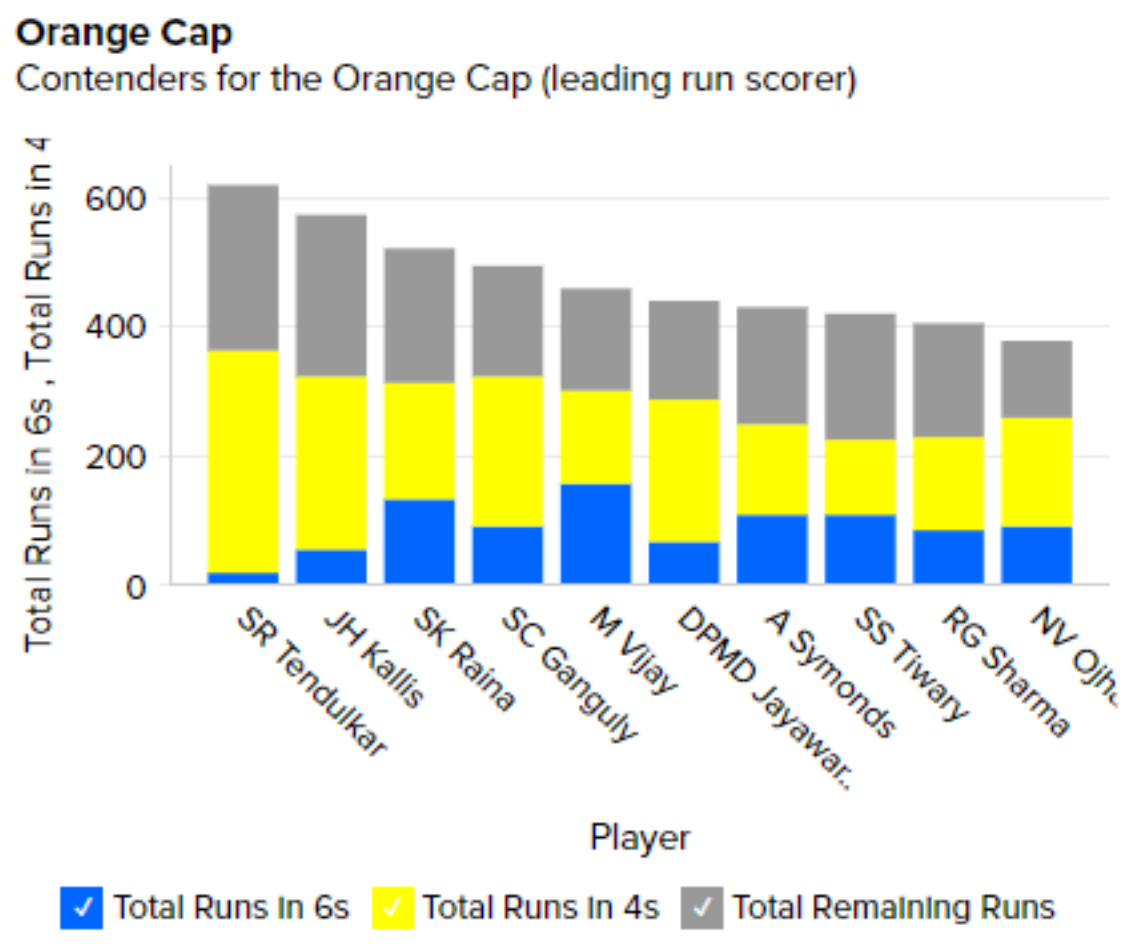
Runs Scored Year on Year

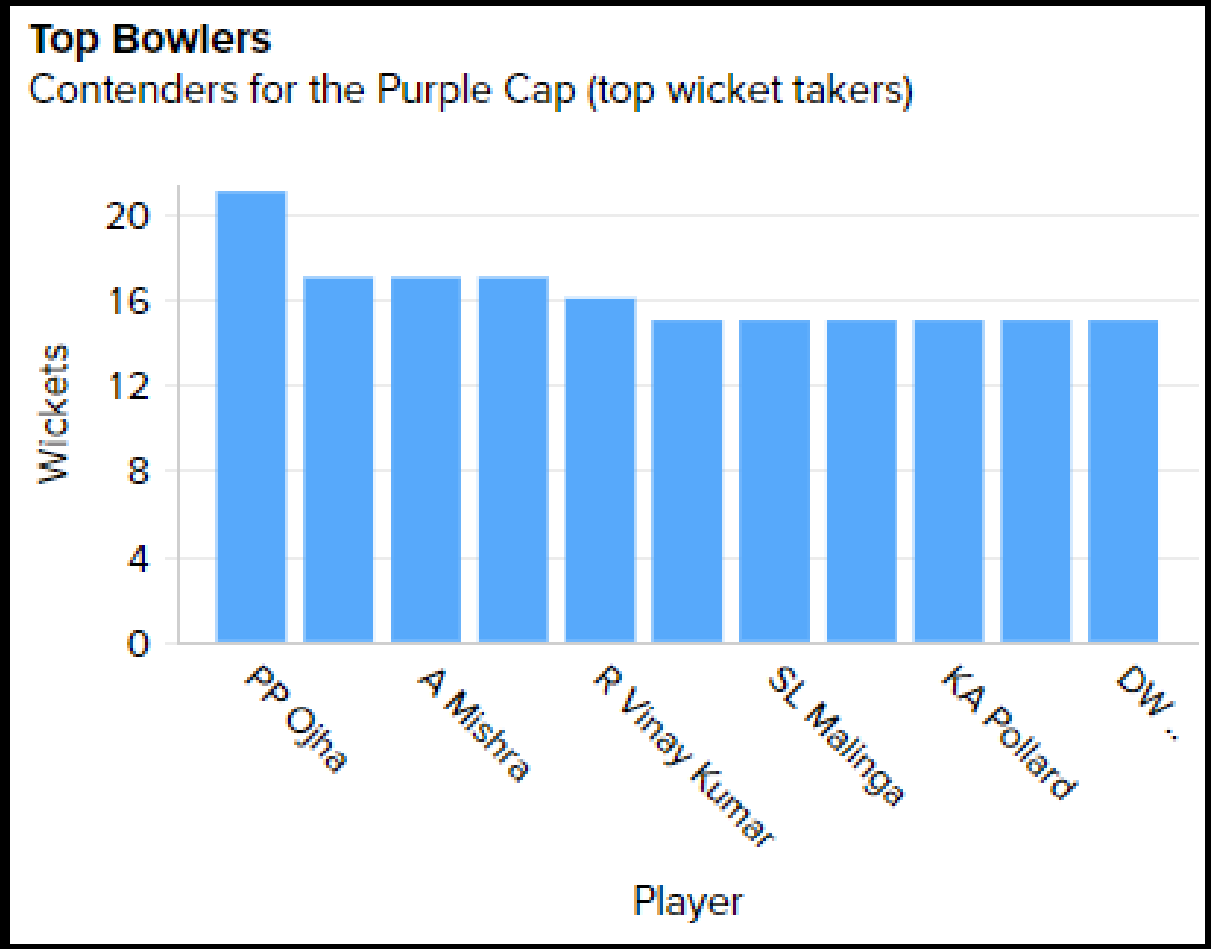


Runs scored Vs. Country



CRICKET STATS..

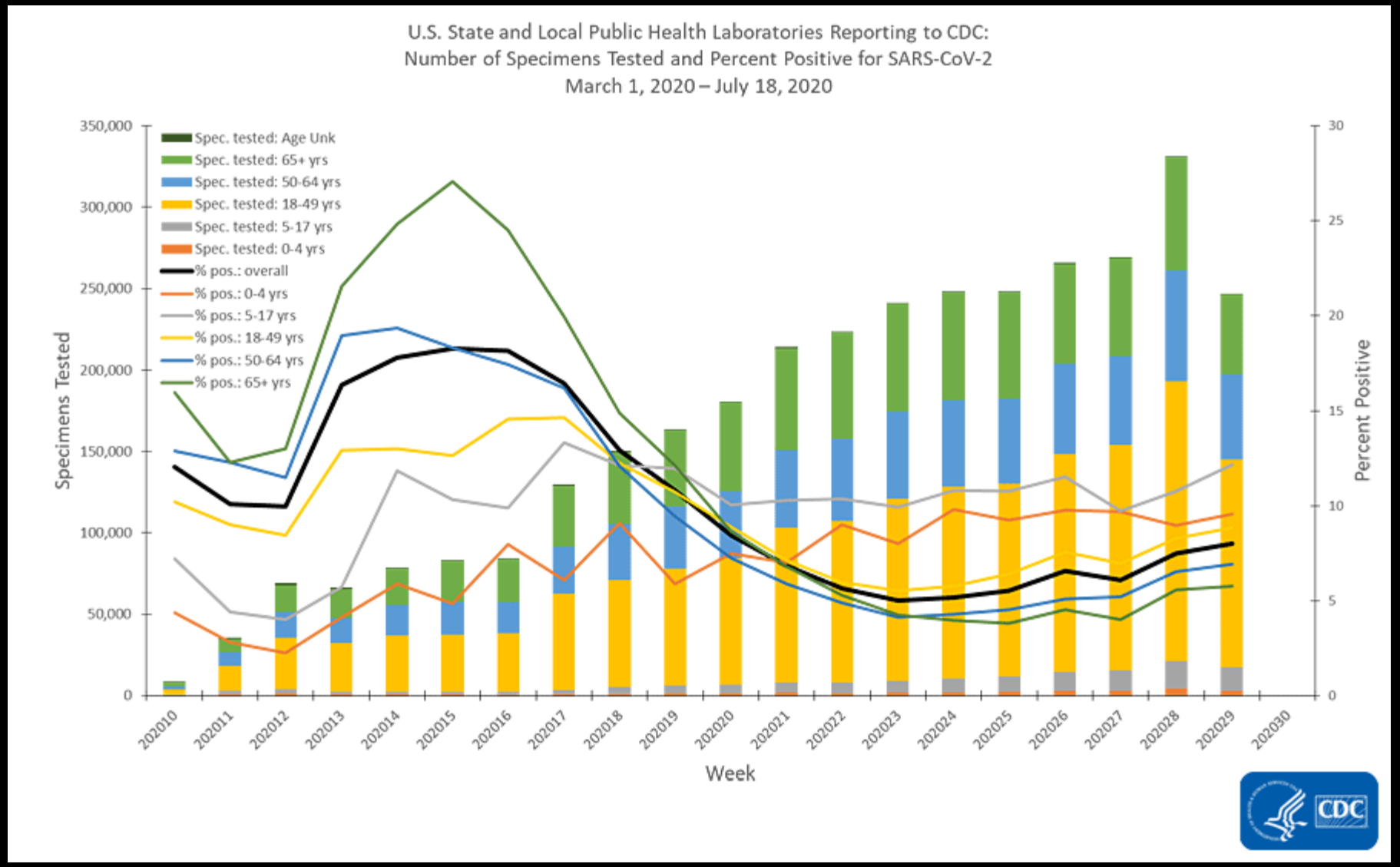




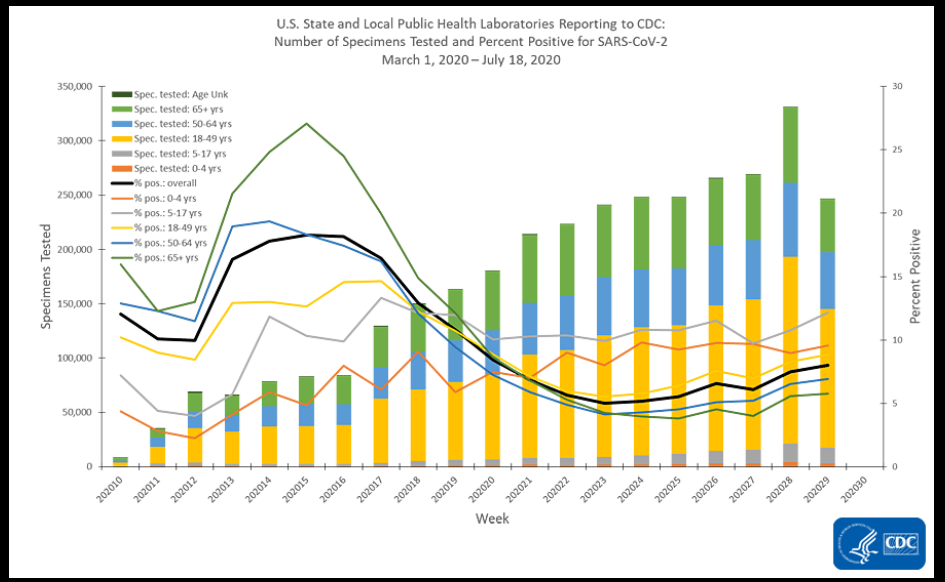
CAN YOU PREDICT THIS?

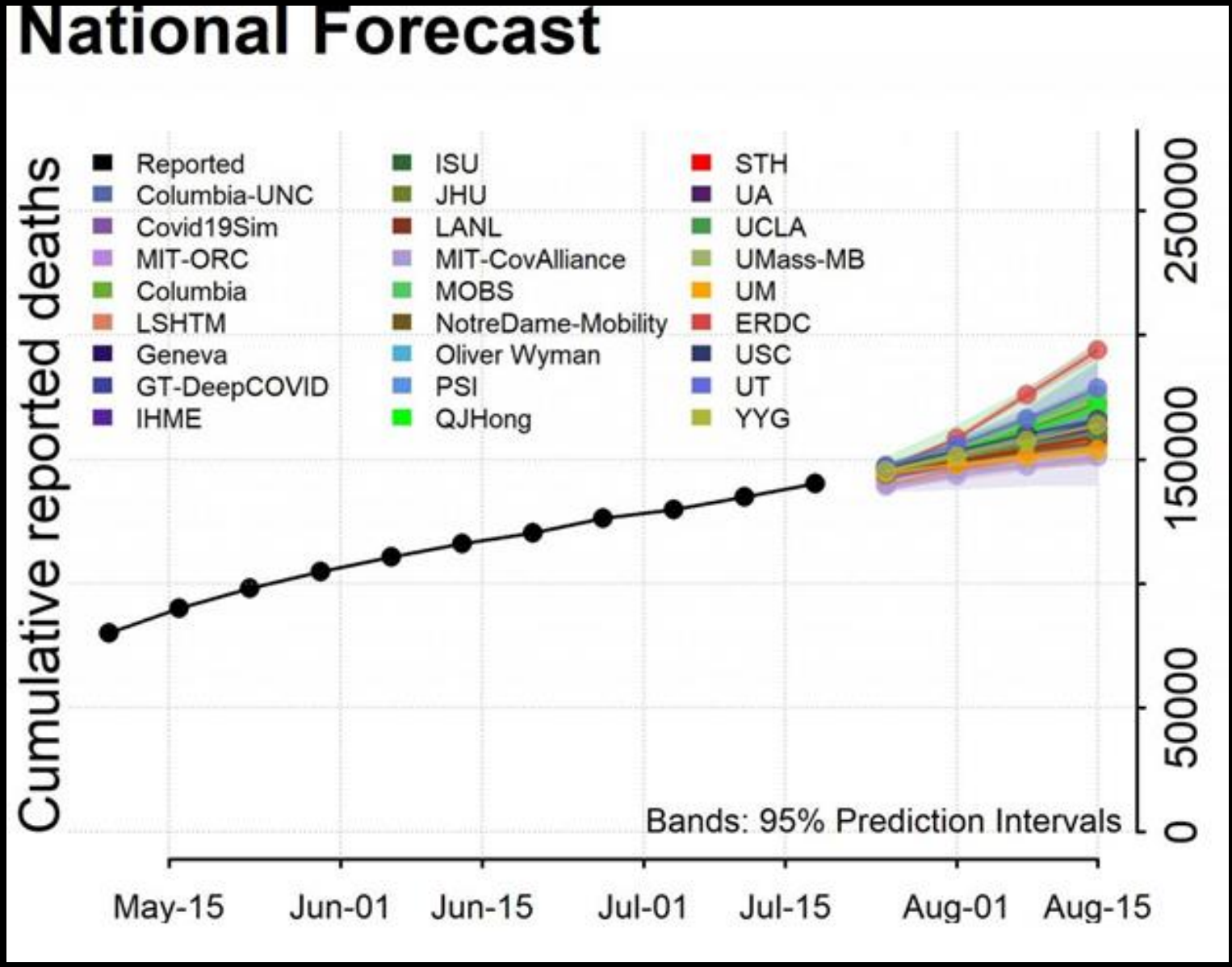
- Can Kohli hit 6 in the next ball?
- How Many Runs Kohli can score in the next over?
- Can this bowler take the wicket in this ball?
- Can India win this match today?

COVID-19 DATA..



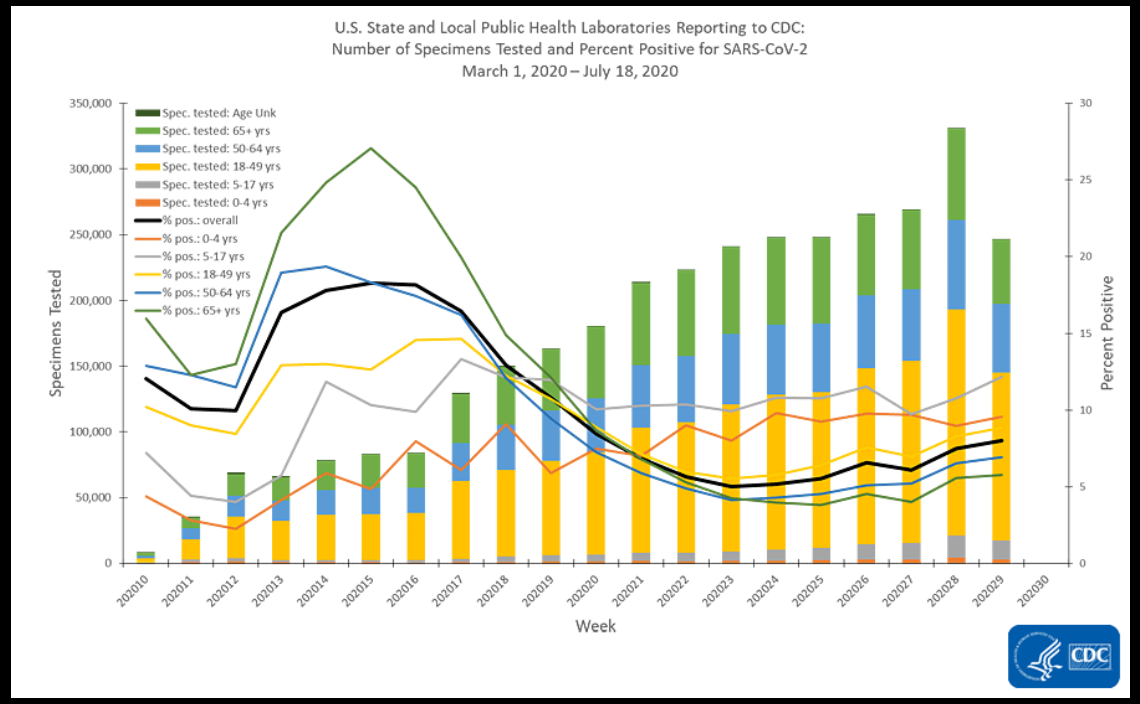
COVID-19 DATA..

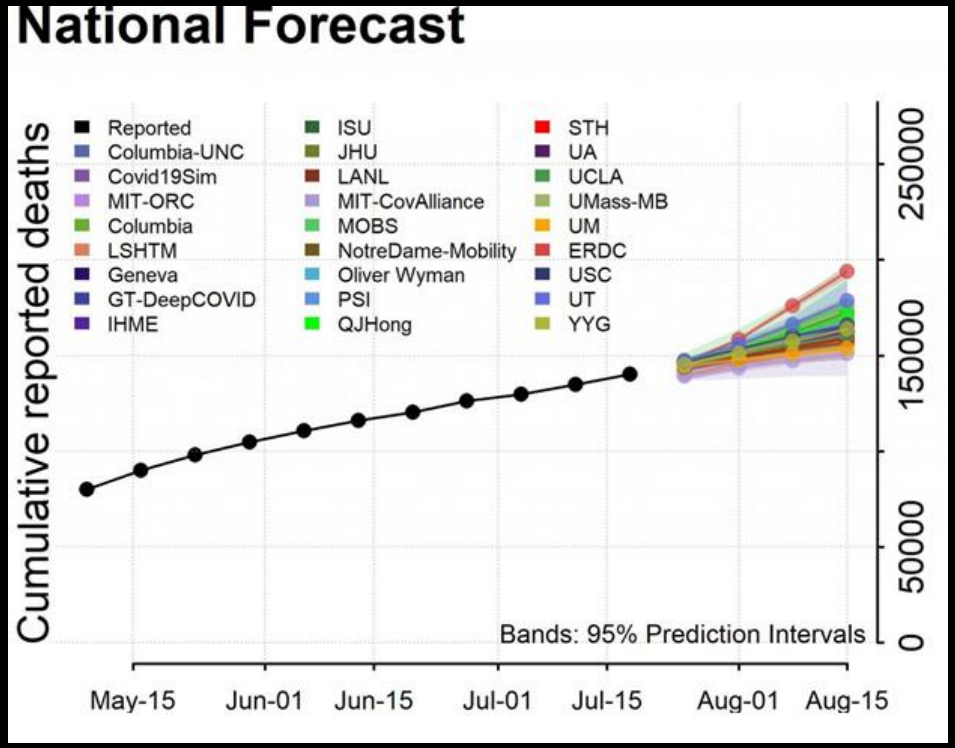




https://www.cdc.gov/coronavirus/2019-ncov/covid-data/forecasting-us.html

COVID-19 DATA..





Descriptive Analytics

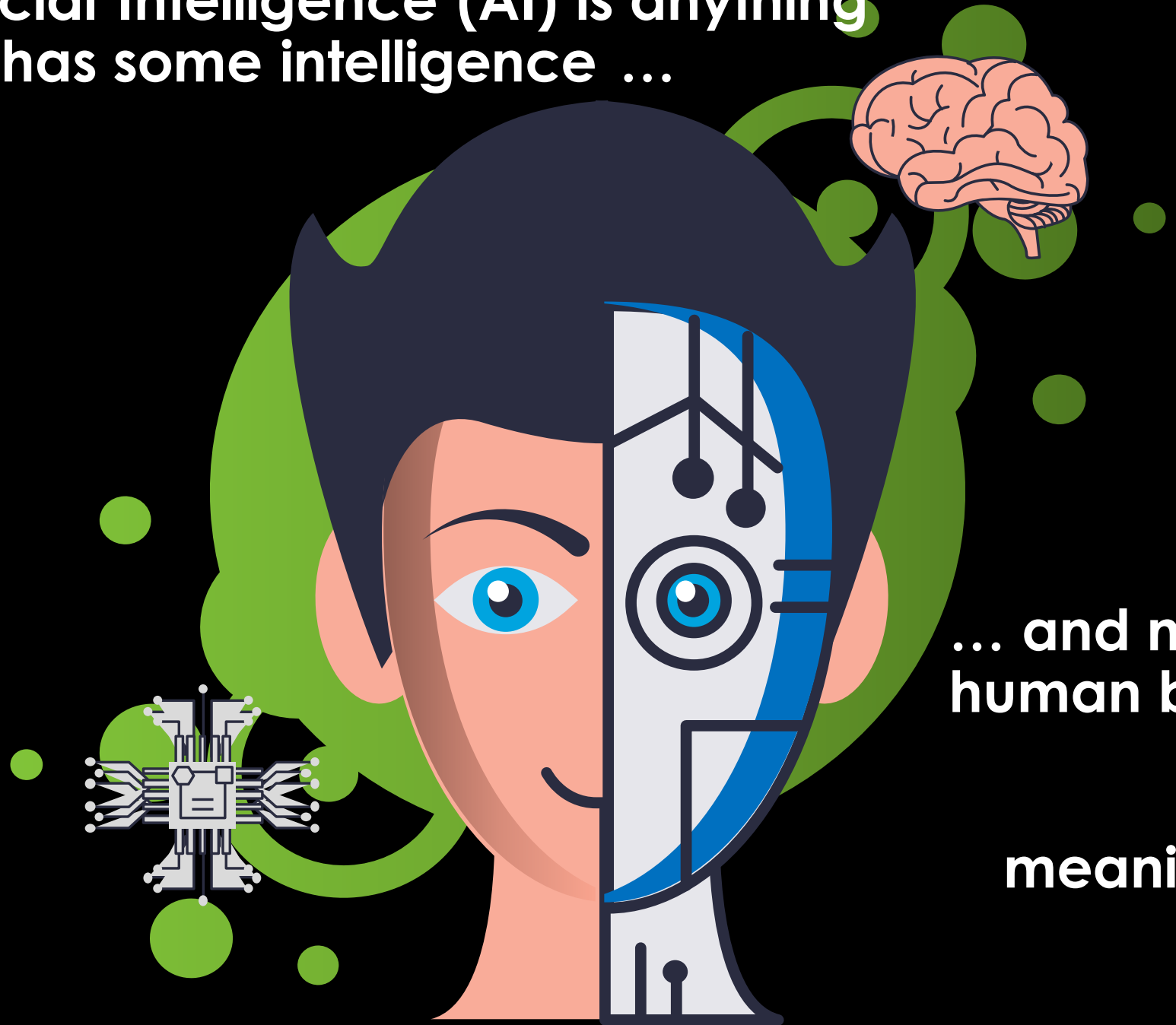
Predictive Analytics

Traditional Analytics

Advanced Analytics

Data Science

Artificial Intelligence (AI) is anything that has some intelligence …



… and mimics human beings

.. to derive meaningful insights

Teaching a Machine..

Machine Learning

Vs

Apple

Red and Round

Pen

Long and Sharp

Learn Features

If you can teach your computer how to do your work in such a way that nobody can find if your have done it or computer has done it..!

Teaching a Machine..

Vs

Red, Green and Round

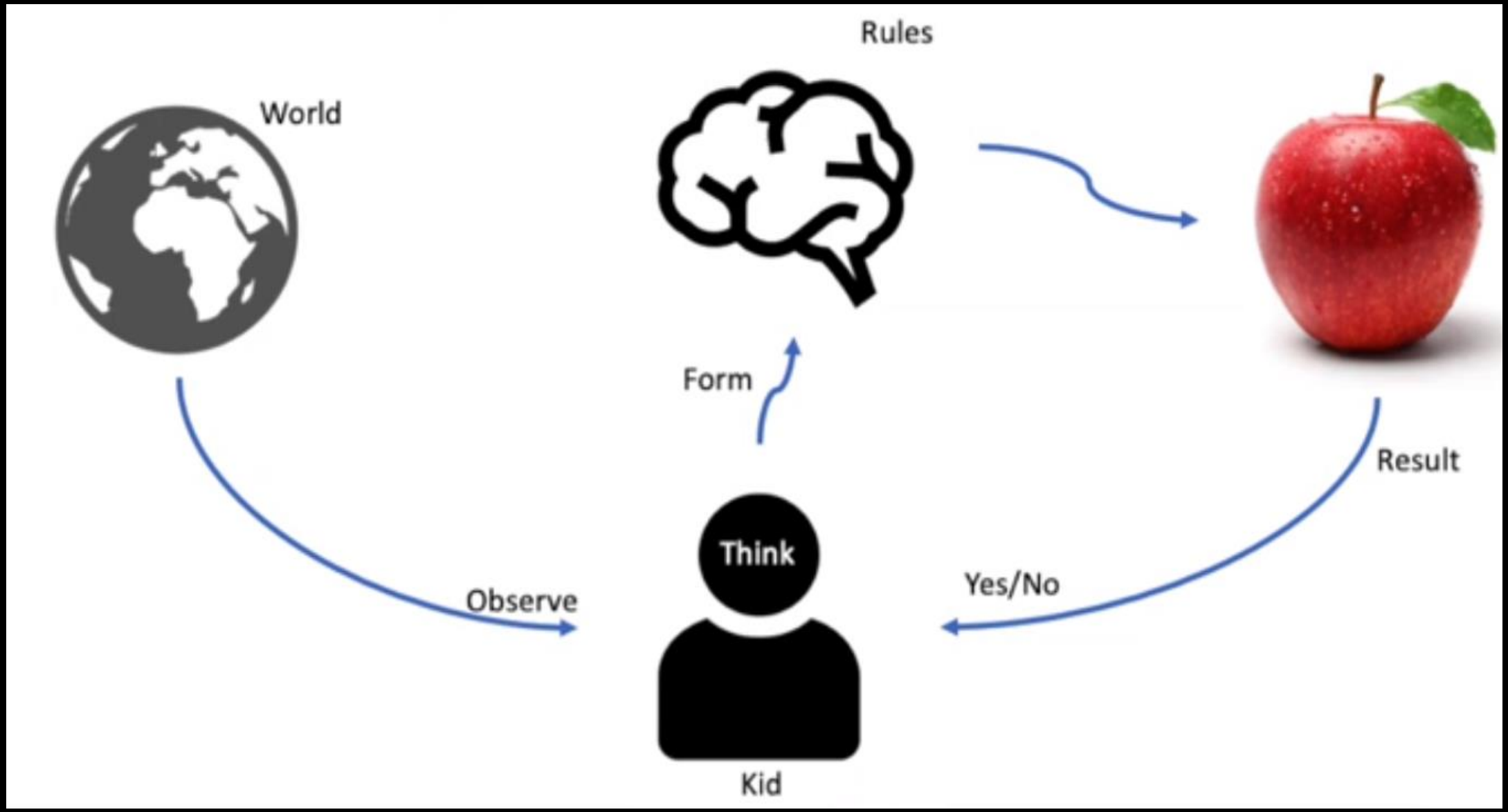
Long, Sharp and any colour

Machine Learning

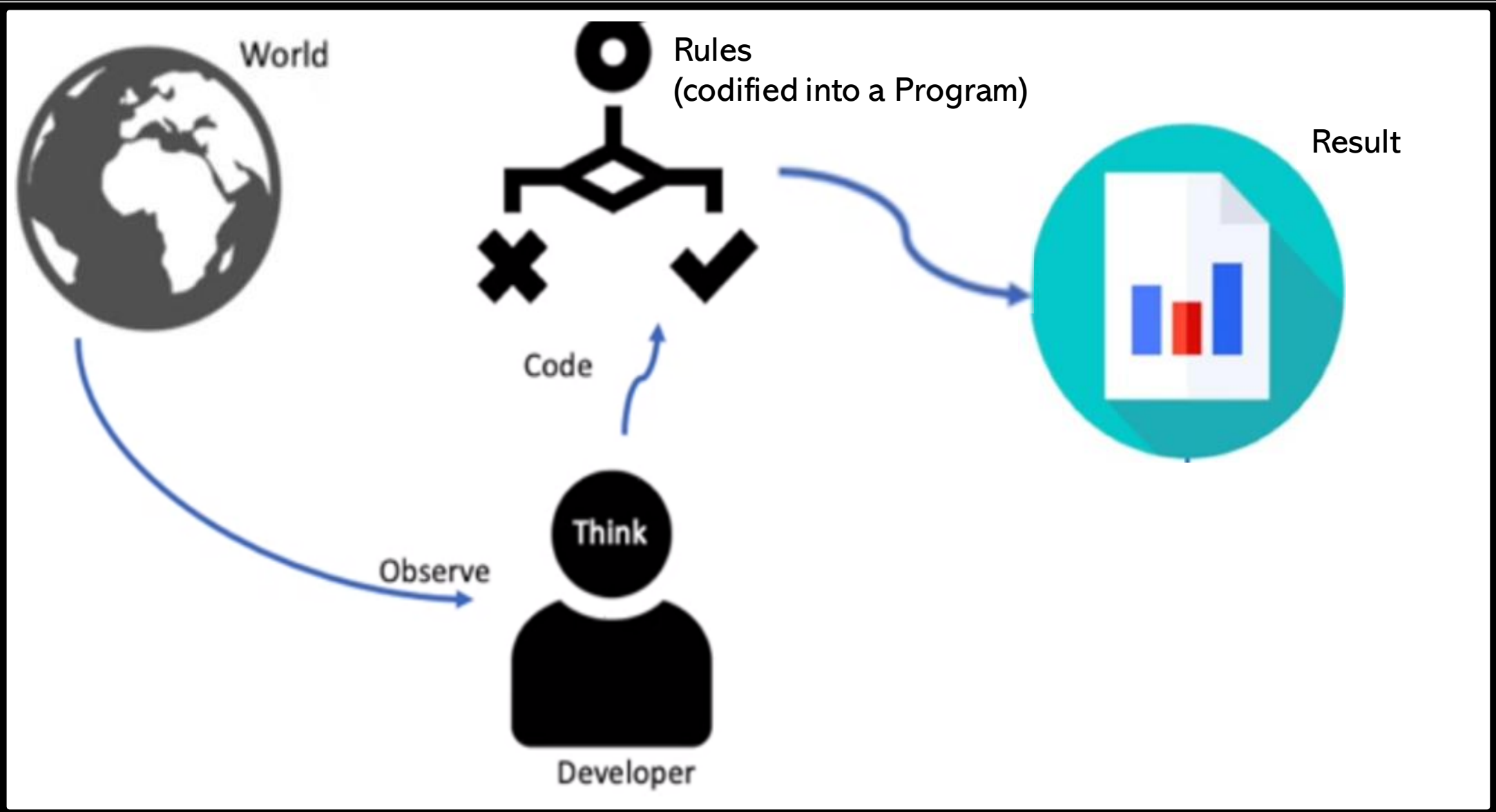
Teach Machine with more data & more features

More the learning, more intelligent the machine becomes.

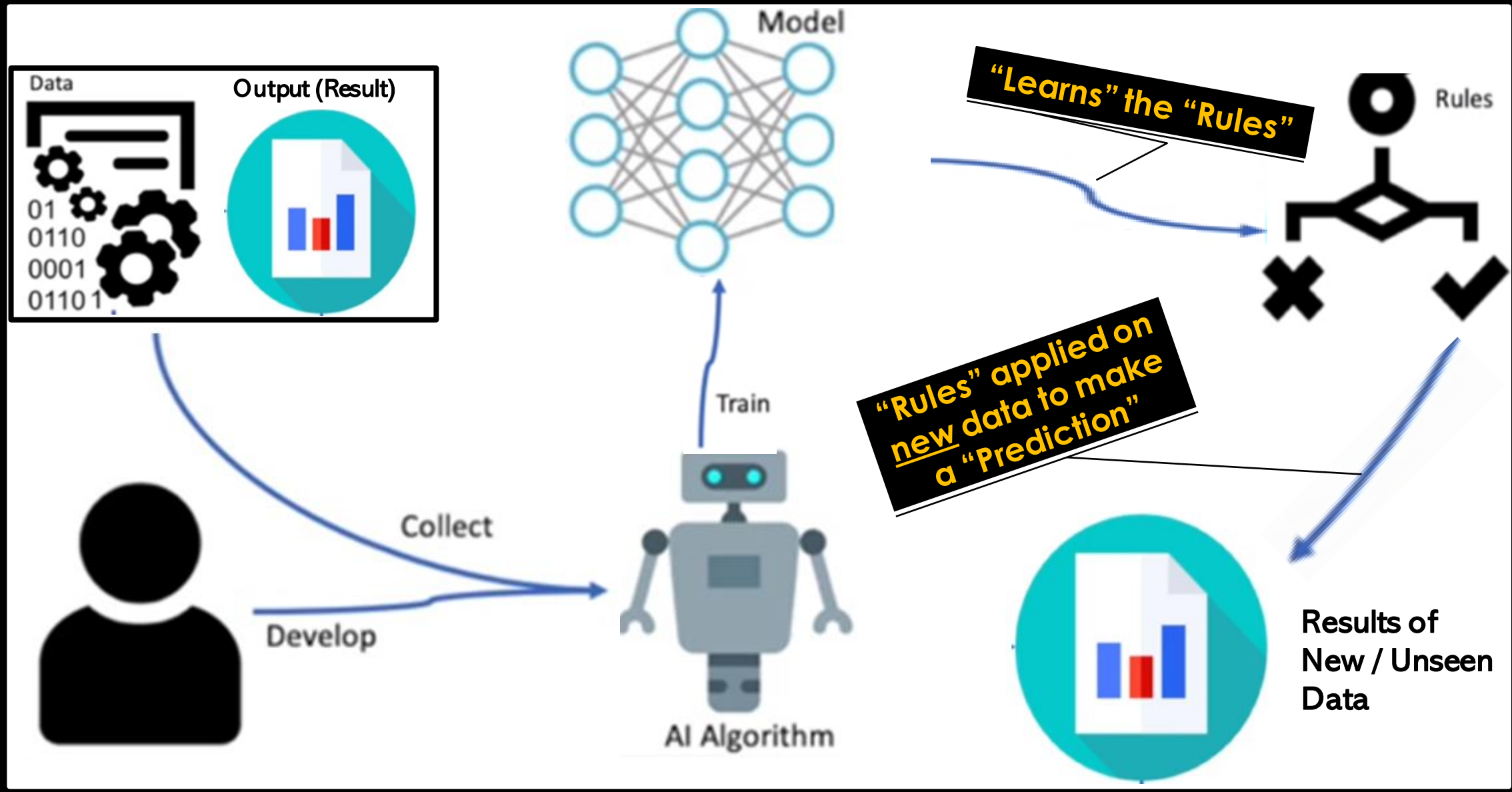
HOW DOES A KID LEARN?



TRADITIONAL PROGRAMMING



MACHINE LEARNING PROGRAMMING



LOOK AT THE ENTIRE PROCESS..

Data Generated → Data Stored → Data Processing → Actionable Insights

Structured and unstructured (ex. video) data

Data is stored in databases and servers

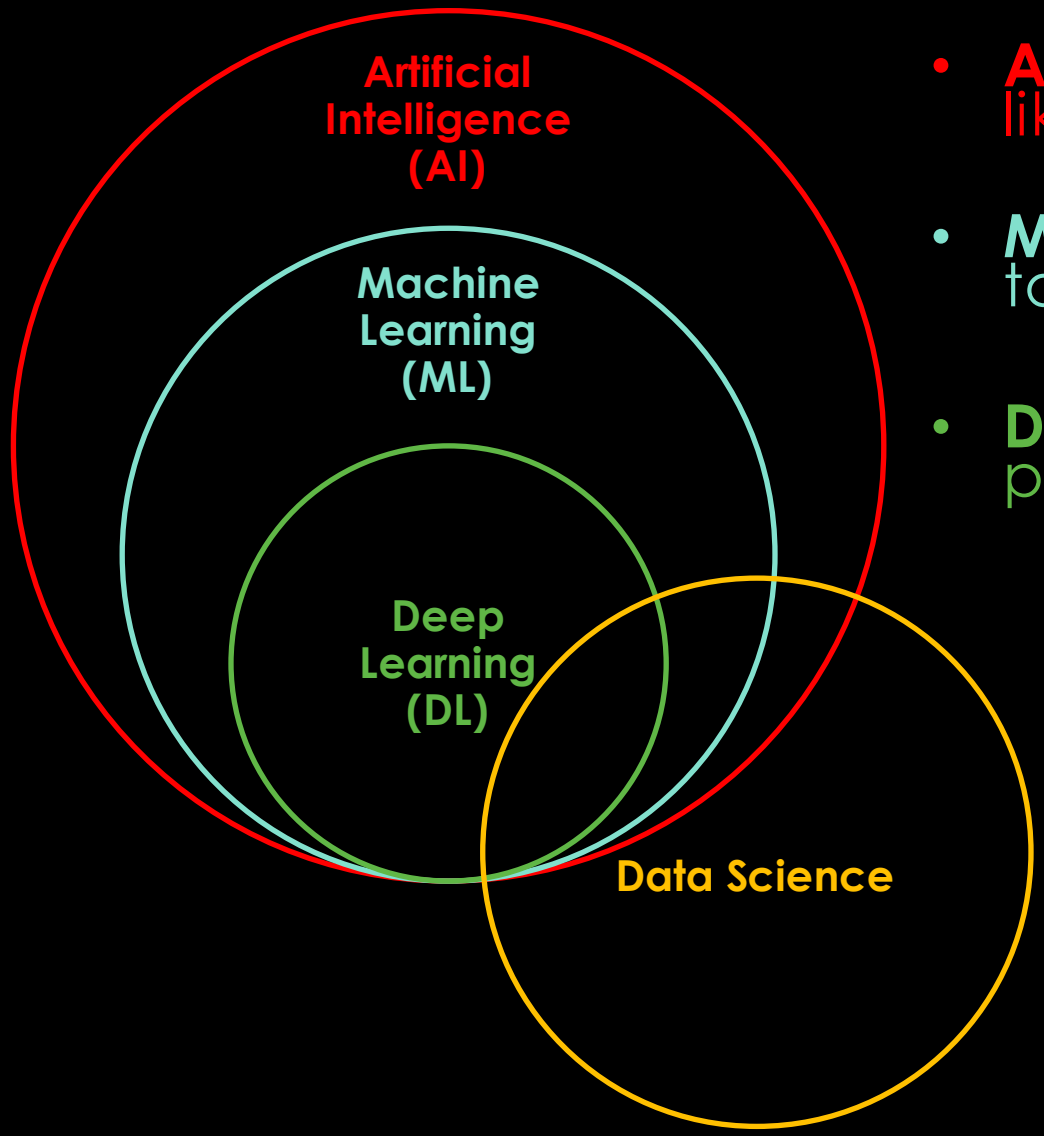
Process the data using CPU/GPUs and AI algorithms to detect patterns

Predictive signals are generated

Big Data

Artificial Intelligence

AI VS ML VS DEEP LEARNING VS DATA SCIENCE

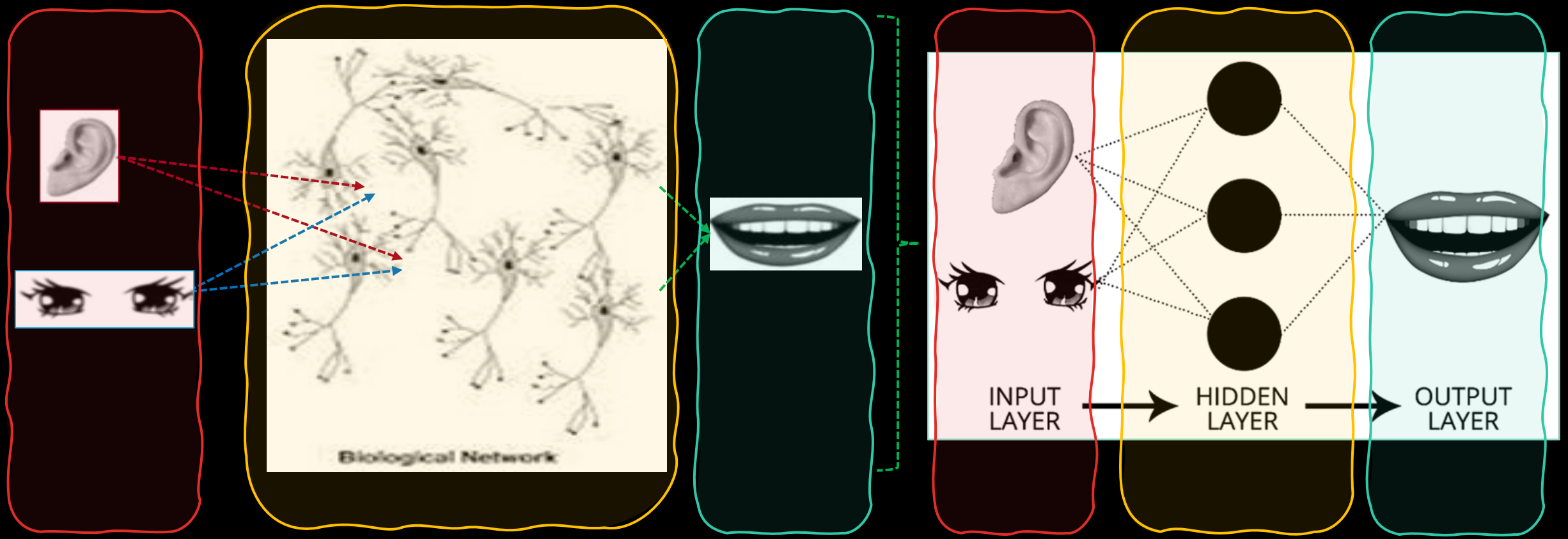


- **AI**: Enable computers to think like humans
- **ML**: A bunch of Statistical tools to learn from data
- **DL**: Involves multiple layers for predictive computation
  - **What is Data Science?** Making sense of data using AI, ML, DL techniques
  - Involves: Probability, Statistics, Linear Algebra, Numerical Optimization etc.

DEEP LEARNING

Human Brain - Neurons

Mimicking Human Brain



NLP VS COMPUTER VISION VS ROBOTICS

→Numbers: **Predictive Modeling**

→Language [Text & Speech]: **NLP**

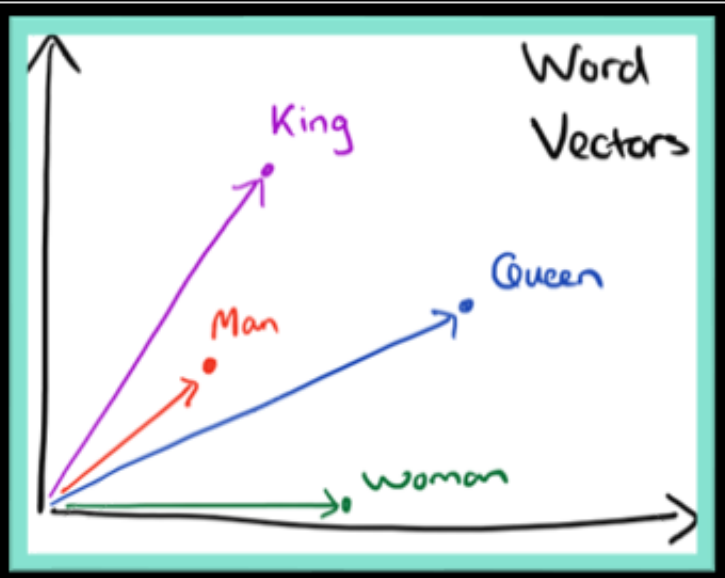
→Image, Videos: **Computer Vision**

→ Preferences: **Recommender Systems**

→ Motion: **Robotics**

King – Male + Female = ?

Queen



The animal didn't cross the street because it was too tired

The animal didn't cross the street because it was too wide

PREDICTIVE MODELING

1

- How Many Runs Kohli can score in the next over?
- What will be ThoughtFocus Revenue for this year?

Quantity / Numerical Value

REGRESSION

2

- Can this bowler take the wicket in this ball?
- Can India win this match today?

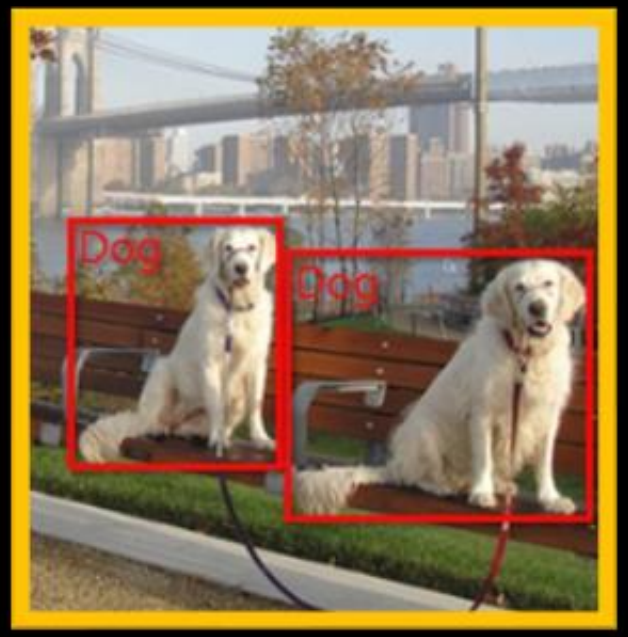
[Yes / No] / Categorical Value

CLASSIFICATION

- Dog or Cat?
- Which Class

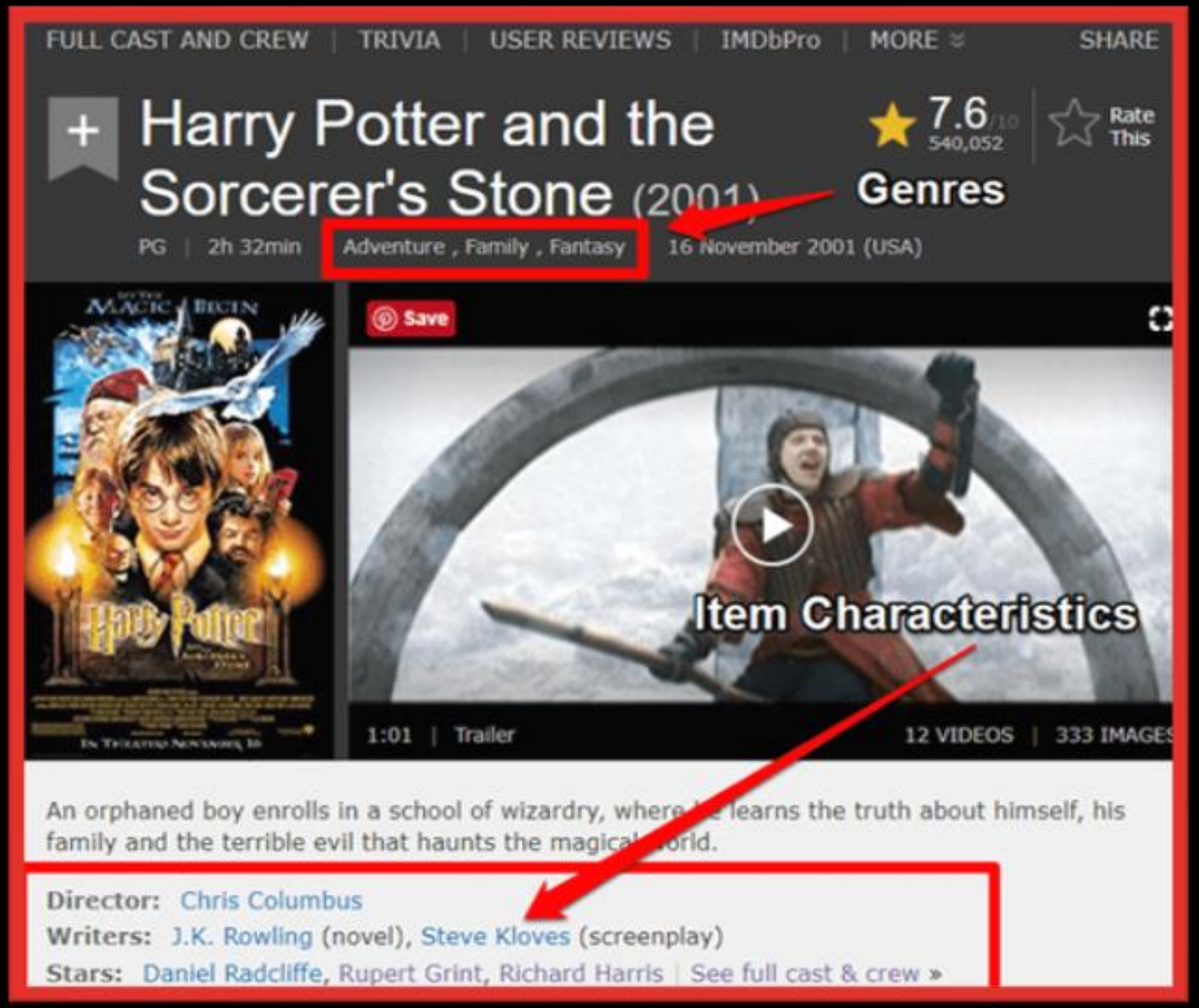
Object Classification

- Which Location?
- Bounding Box



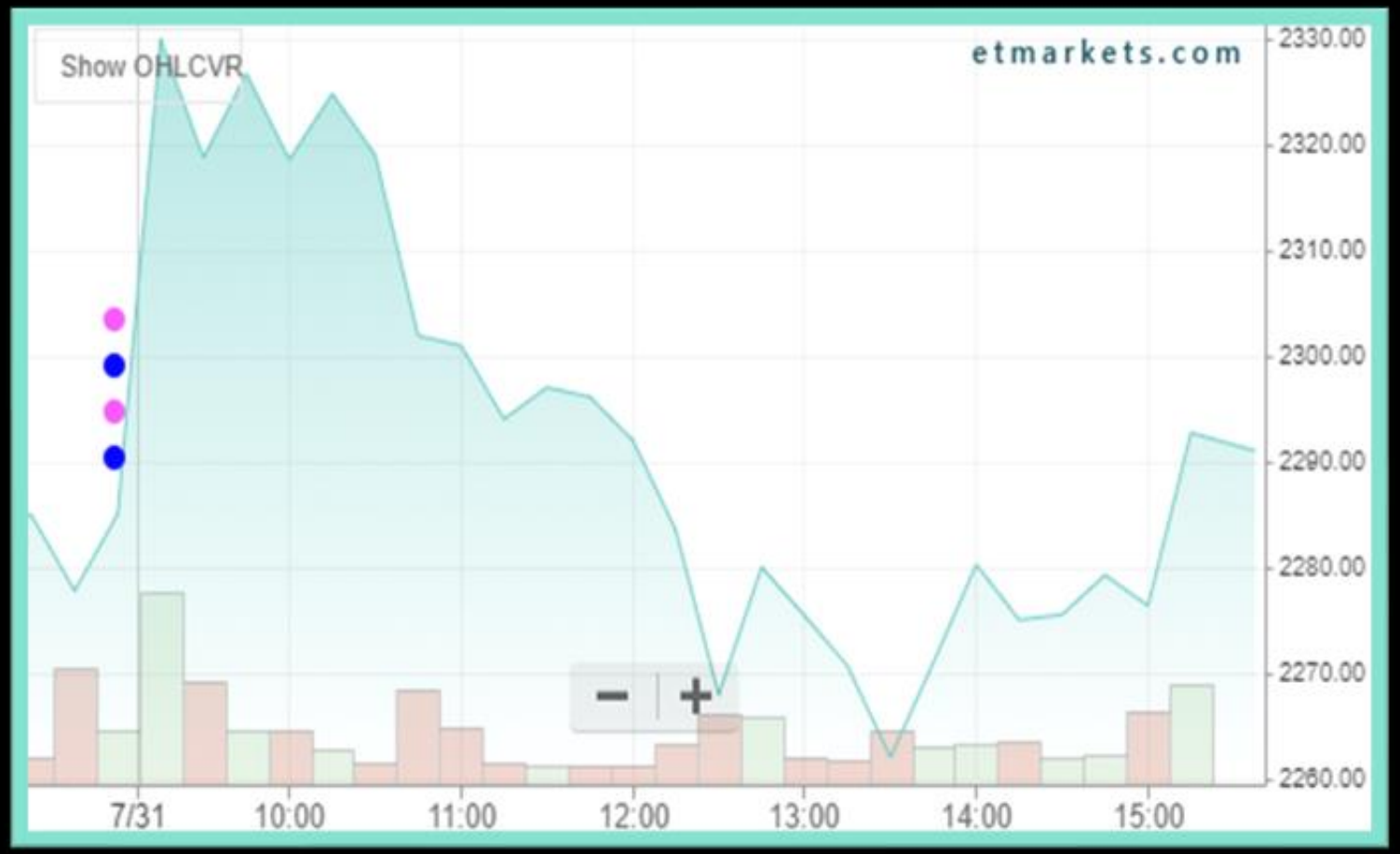
Object Detection

RECOMMENDER SYSTEMS



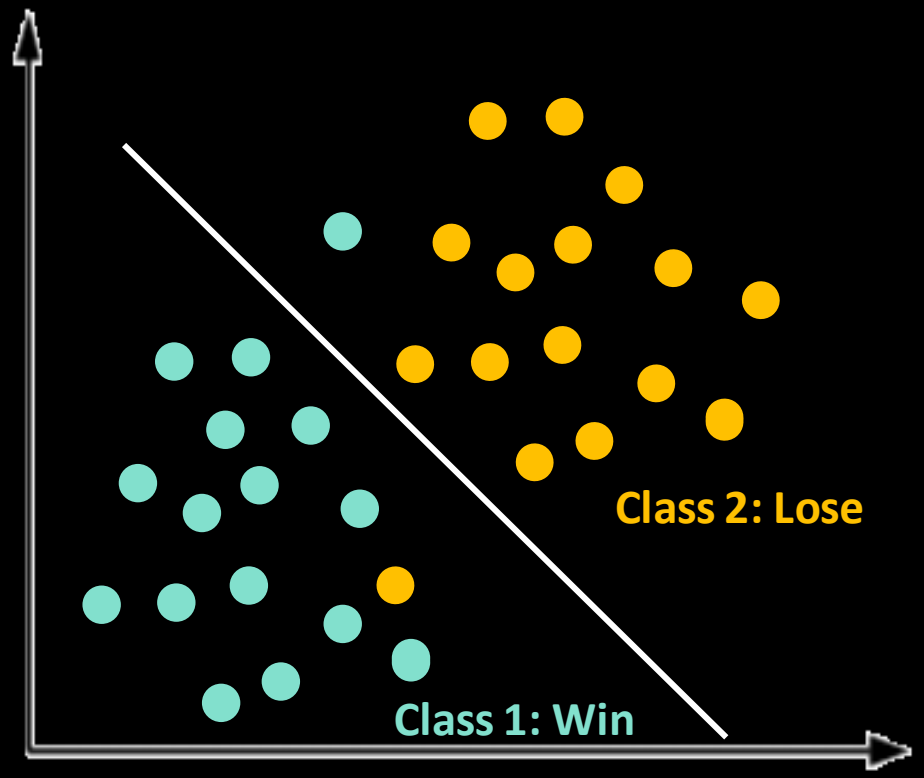
Recommends a Content / Product based on <u>Personal Preference</u>

TIME SERIES ANALYSIS (TSA)



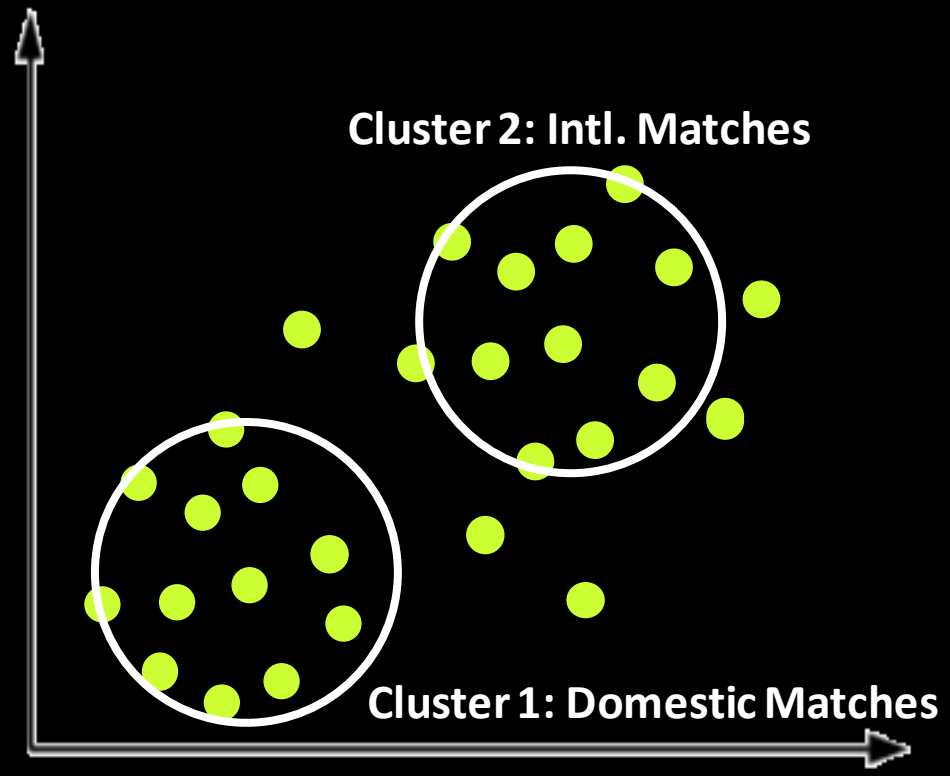
Time Sensitive Data is forecasted thru TSA

SUPERVISED VS UNSUPERVISED



- Labelled data is Available

Supervised Learning



- Labelled data is Not available

Unsupervised Learning

QUIZ TIME

IDENTIFY: REGRESSION / CLASSIFICATION / NLP / RECOM. SYSTEM / OBJECT DETECTION / TIME SERIES

1. What will be my sales for the next quarter?

2. How to detect a fraud transaction?

3. Can I offer credit card to my customer?

4. What will be the Credit Score of a borrower?

5. Based on text in the customer review, identify it as a Good or Bad review?

QUIZ TIME

IDENTIFY: REGRESSION / CLASSIFICATION / NLP / RECOM. SYSTEM / OBJECT DETECTION / TIME SERIES

6. Is this a genuine insurance claim?

7. What will be my stock price of Reliance Industries at 3 PM tomorrow?

8. Based on the articles read in a magazine, suggest the next article

9. Is my employee wearing a Mask?

10. Identify Door in the given image

Thank you