# Data Analytics for Scanning

by

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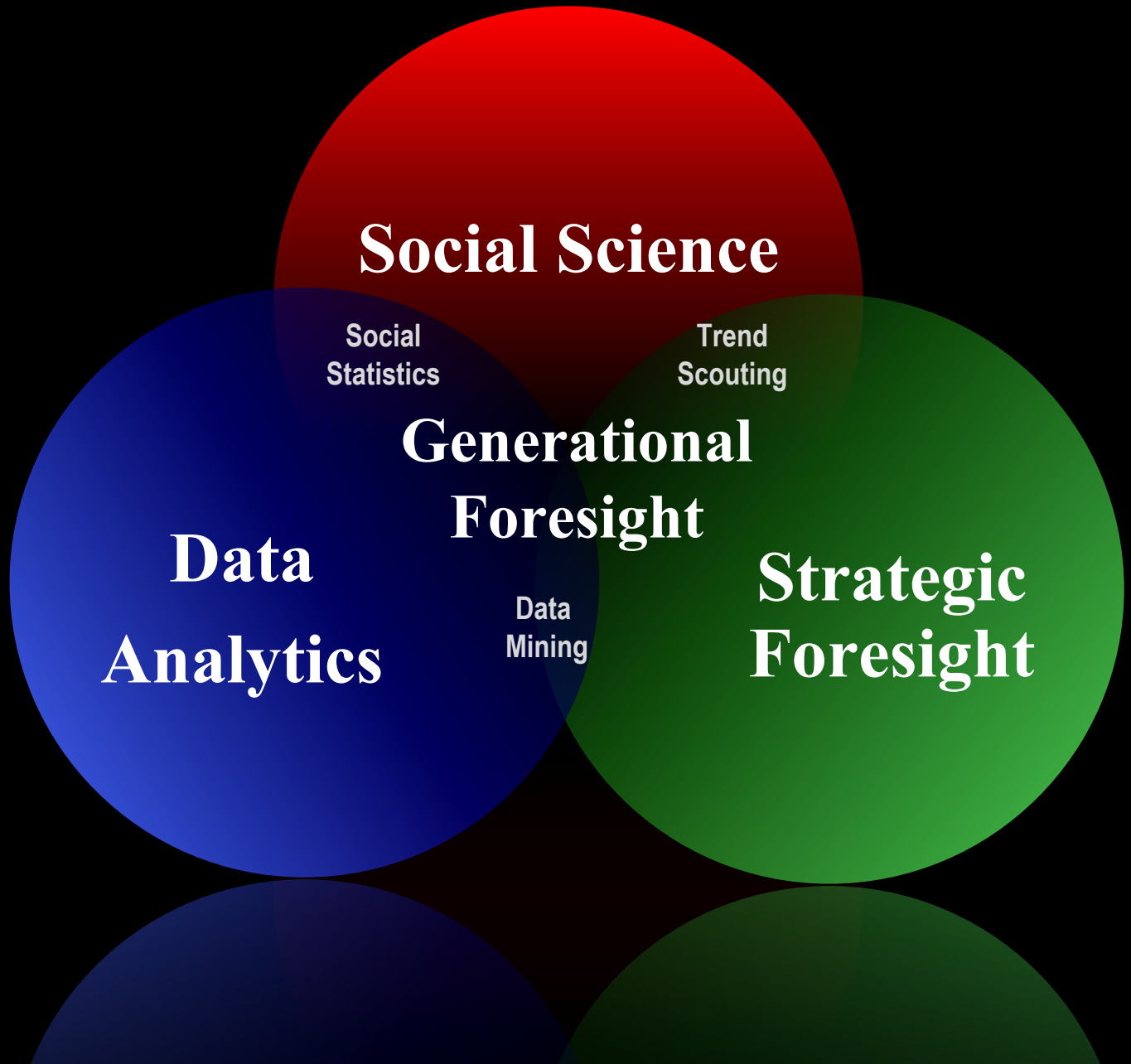
UH Annual gathering 2018

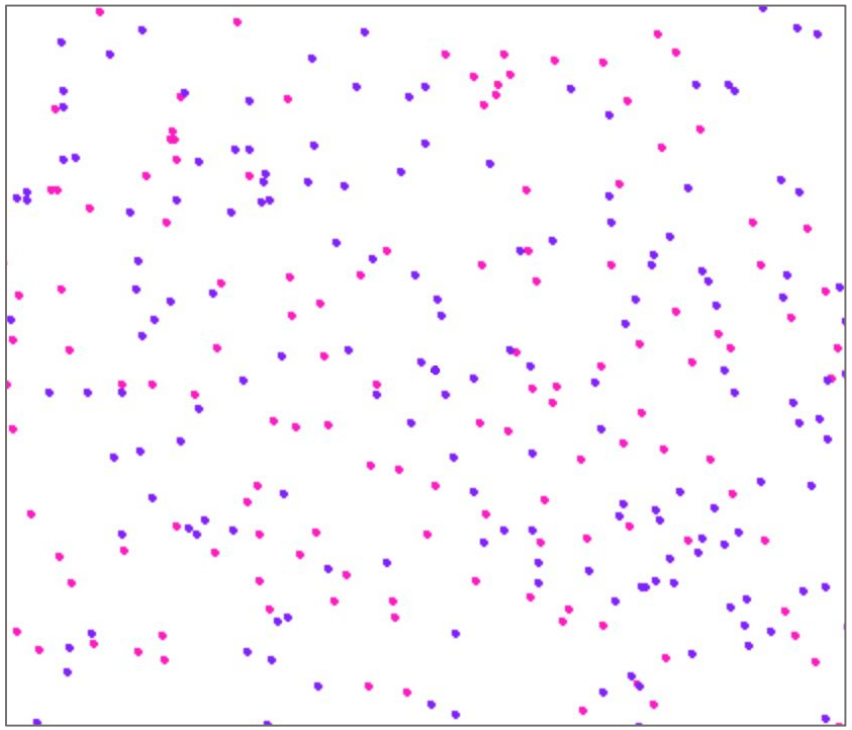
Data in Zettabytes


Social Science
Social Statistics
Trend Scouting
Generational Foresight
Data Analytics
Data Mining
Strategic Foresight

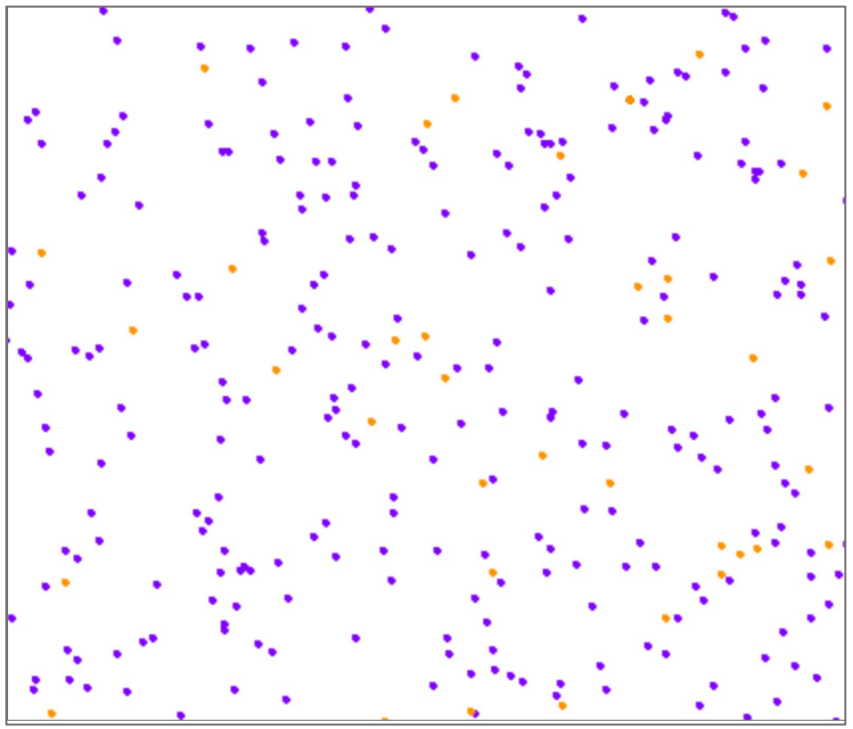
1

2

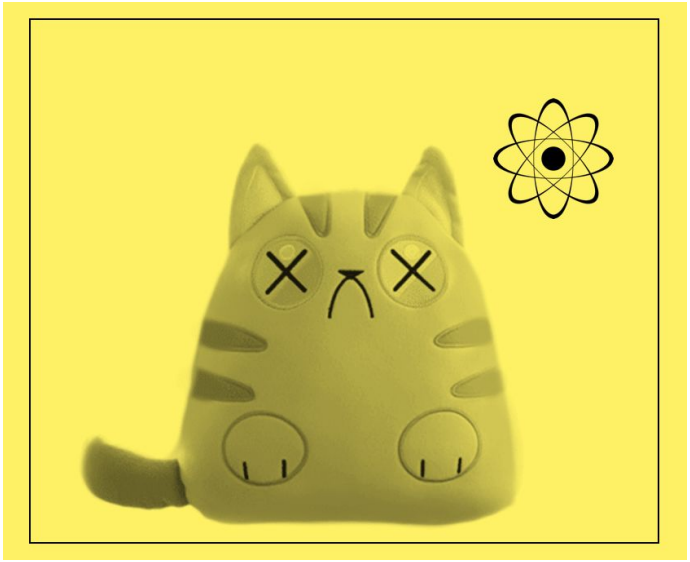
Type 1 Error

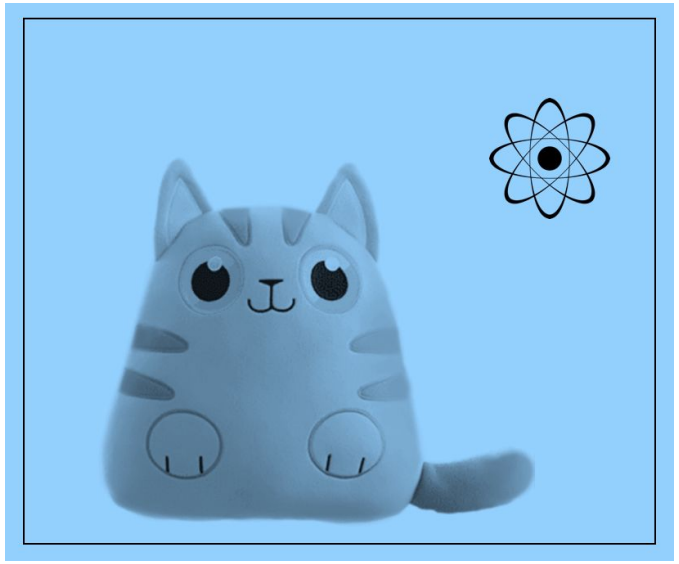


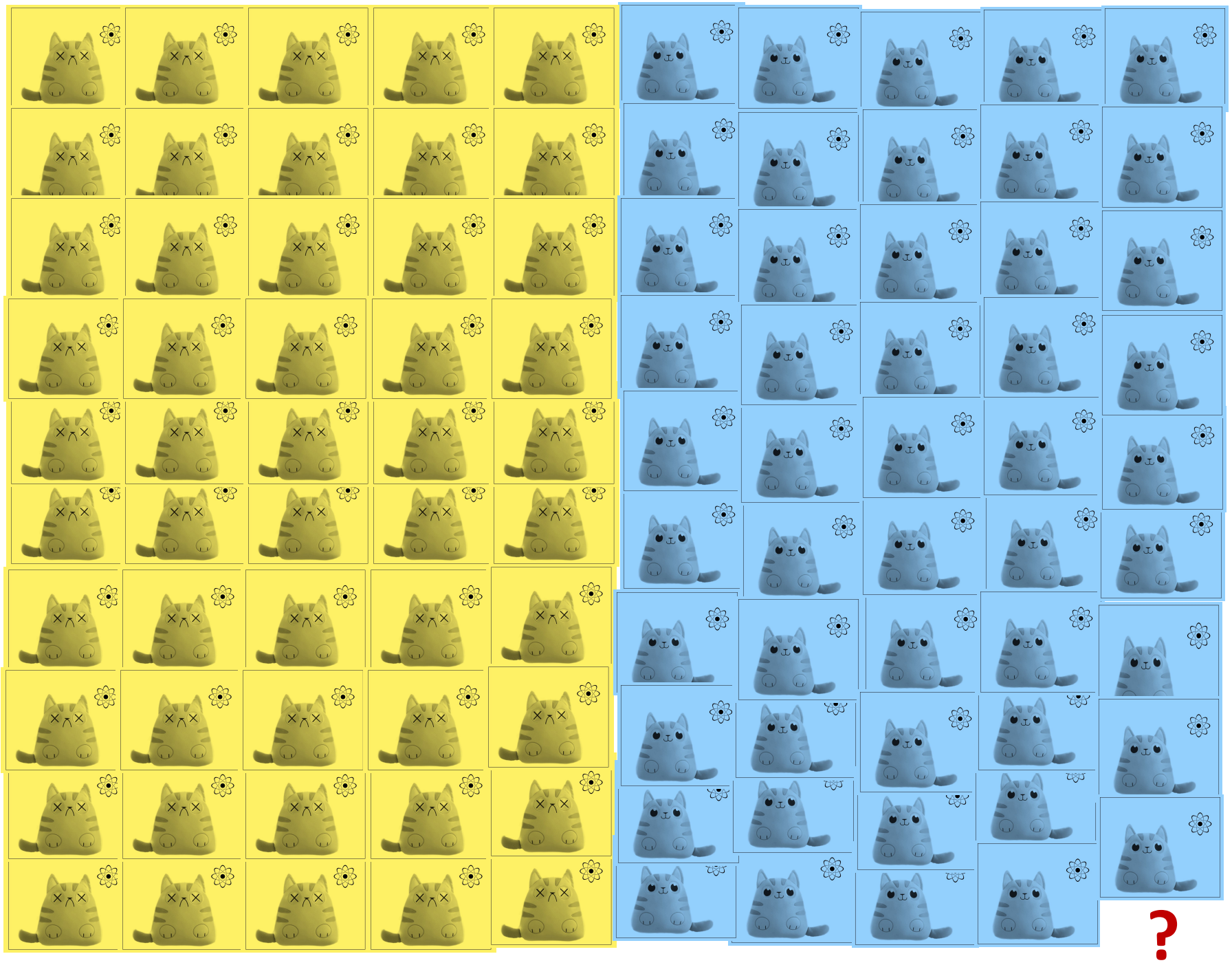
Type 2 Error



# Let’s play Schrödinger's cat!

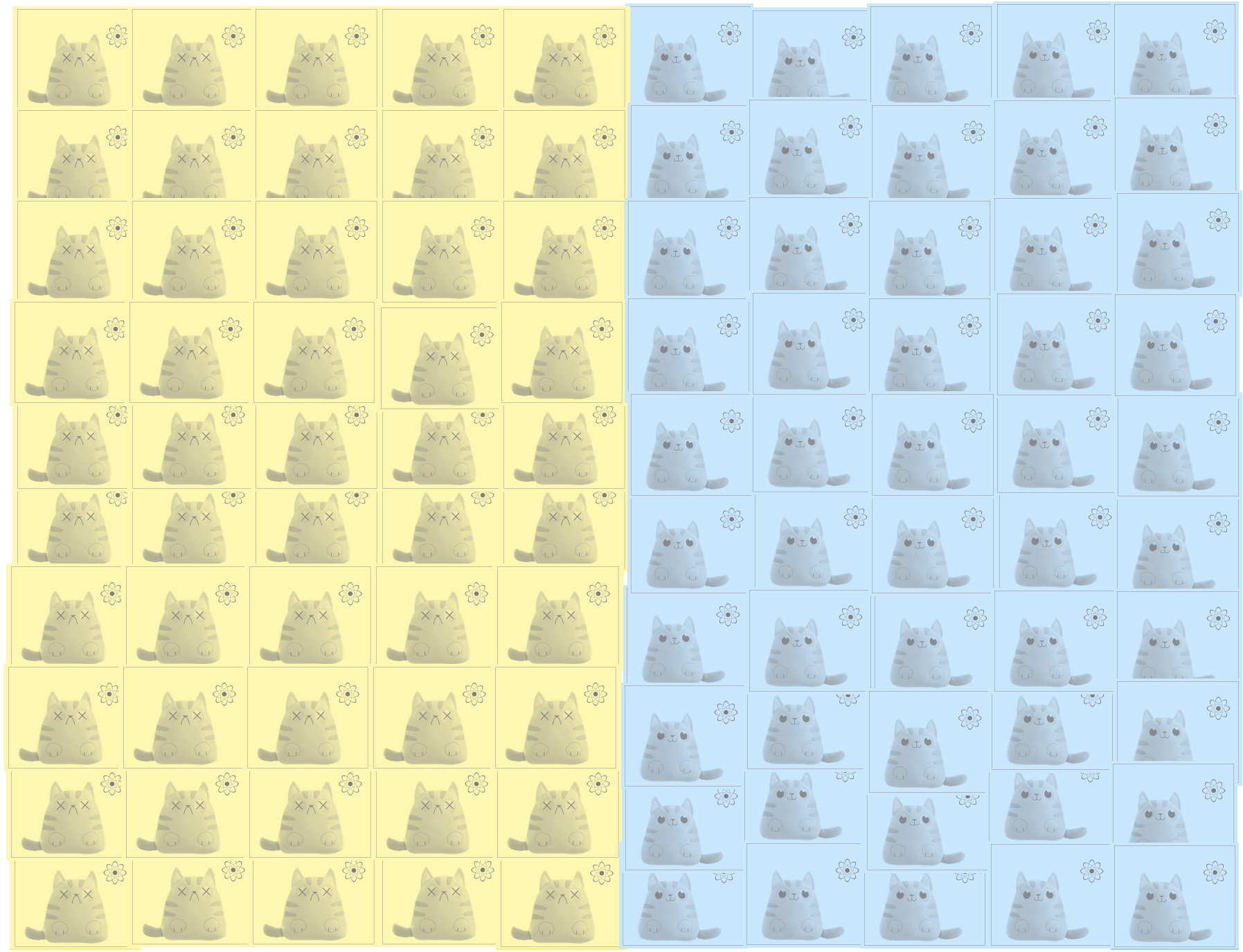







Probability the last cat is alive?

Probability 50 out of 100 will be alive?



# Disease or no disease?

# Does failure lead to success?


April 18, 2017 Tomas Ondrejka

Career, Entrepreneurship, Famous Resumes

## Elon Musk's Resume of Failures Proves That Your Failures Aren't Big Enough

# Descriptive

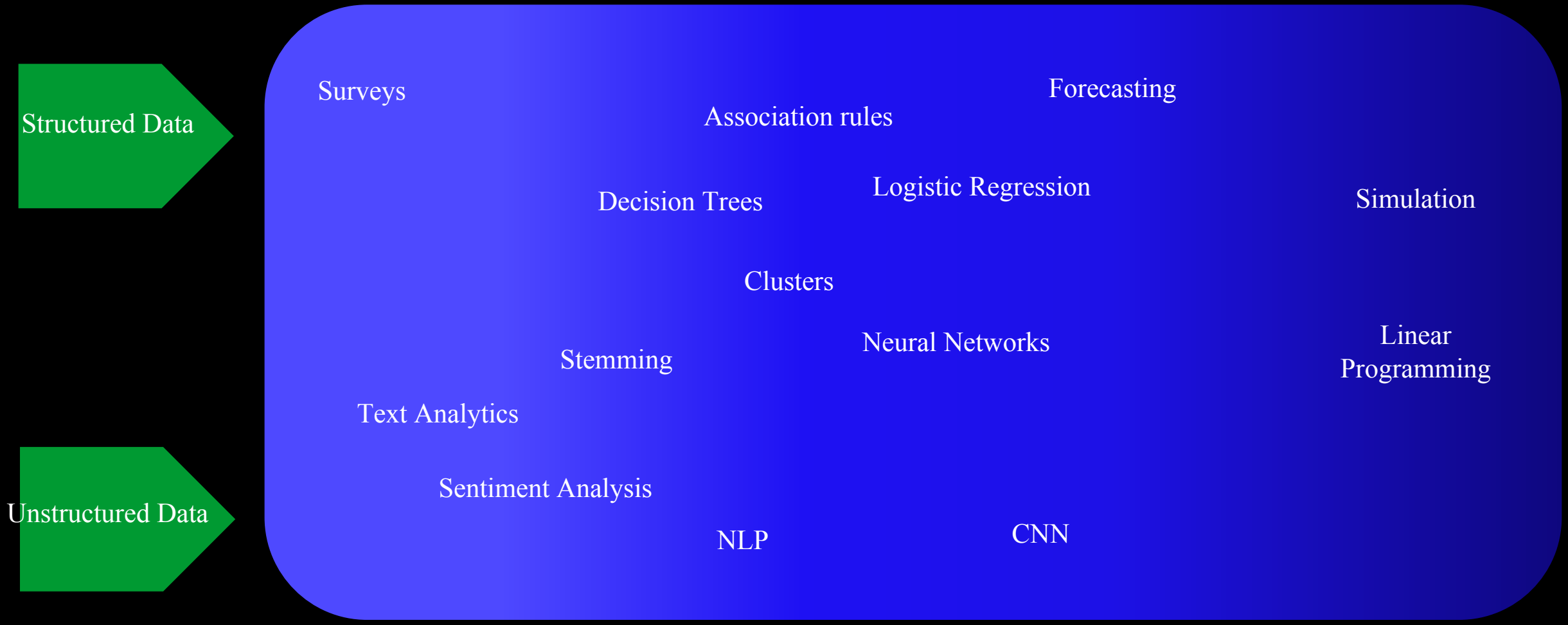
creates a summary of historical data.

# Predictive

Identifies the likelihood of future outcomes based on data mining, algorithms and machine learning techniques

# Prescriptive

finds the best course of action for a given situation



# Judging a survey

## relevance – validity - reliability

- What is being asked?
- Who are asked?
- How are they being asked?
- How is it interpreted?

# Relevance

Does it answer what you *really* need to know?

# Norwegian media barometer

**UPDATED**

April 20, 2017

**NEXT UPDATE**

Currently not determined

**67%**

watching television on average

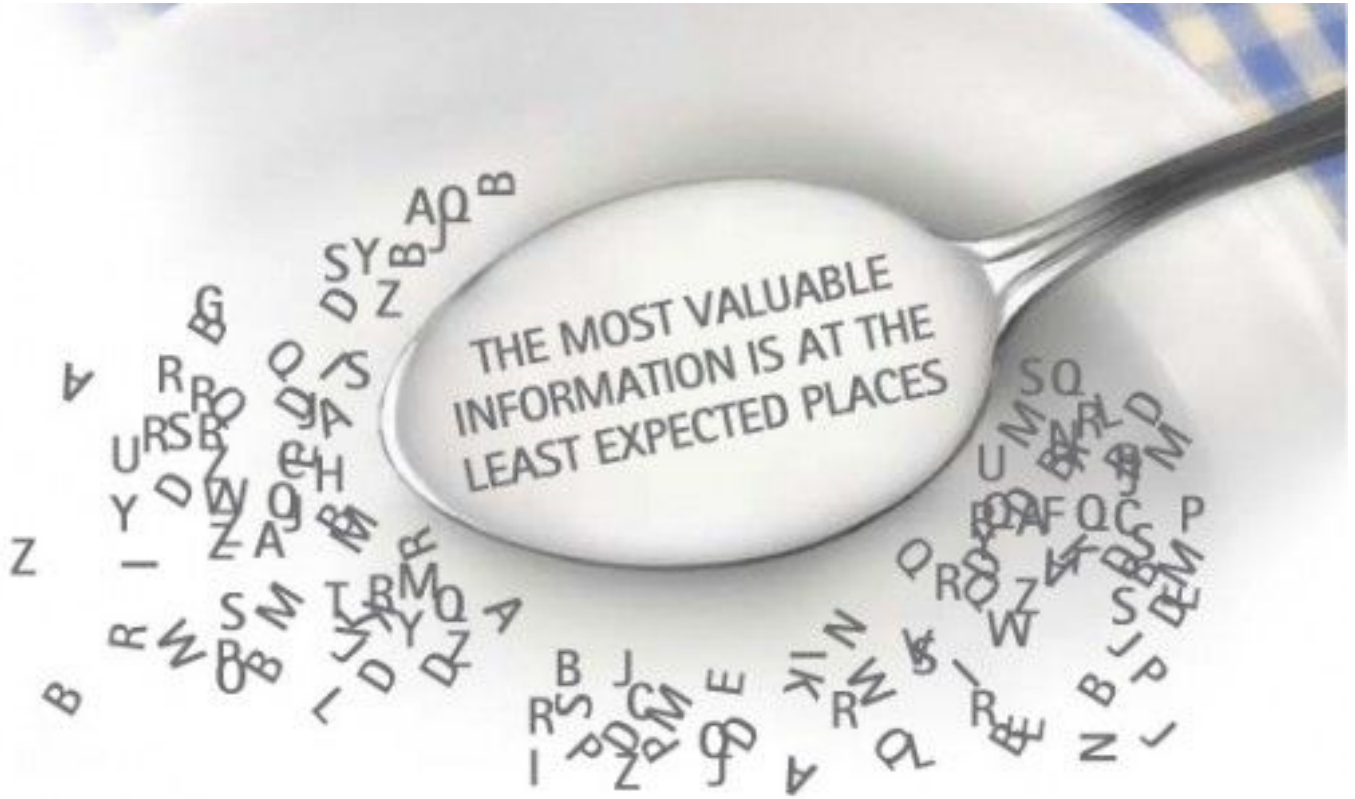
**Share that has used different mass media an average day (9-79 years)**

| | percent | | | |
|---|---|---|---|---|
| | 1991 | 2000 | 2015 | 2016 |
| Printed | 84 | 77 | 42 | 39 |
| Television | 81 | 82 | 67 | 67 |
| Radio | 71 | 57 | 59 | 59 |
| audio media | 43 | 50 | 38 | 37 |
| weekly magazine | 21 | 17 | 7 | 5 |
| Books | 24 | 20 | 23 | 25 |
| Journal | 18 | 14 | 8 | 8 |
| comic Blade | 11 | 9 | 3 | 3 |
| Series / Movie / Video [1] | 10 | 10 | 21 | 26 |
| Internet | .. | 27 | 87 | 89 |

[1] Also includes streaming services via the internet

# Do pay for a professional census-representative sample

# Text mining marries qualitative and quantitative methods

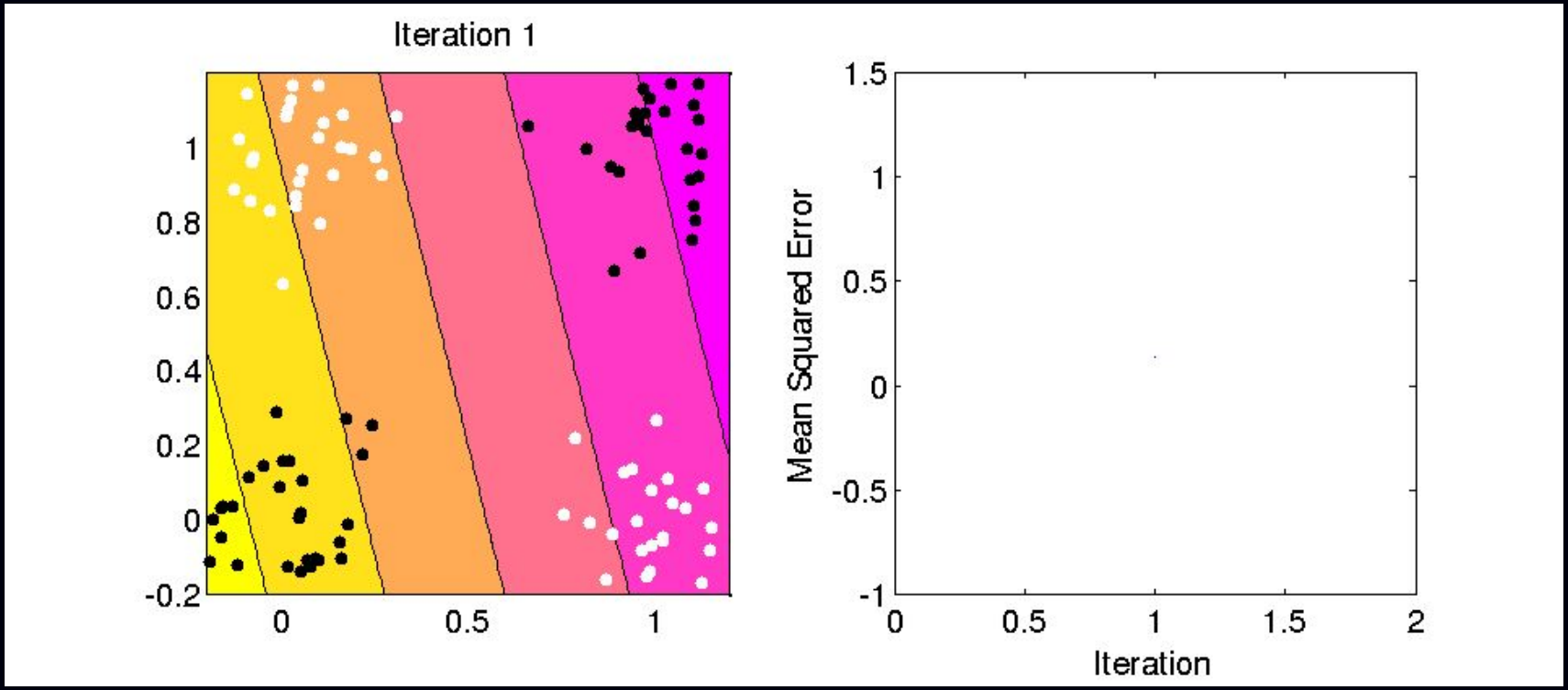


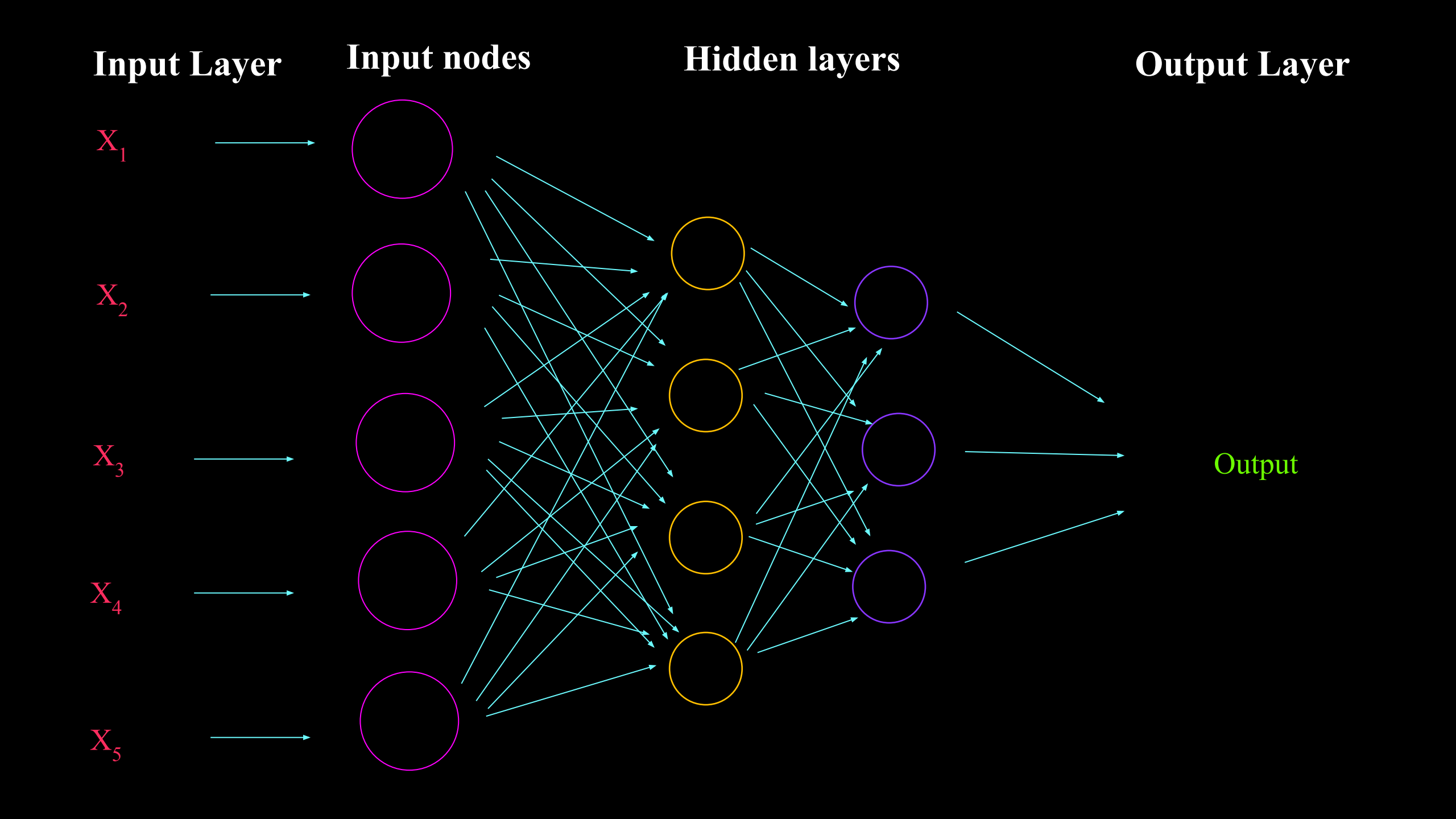
# Decision trees

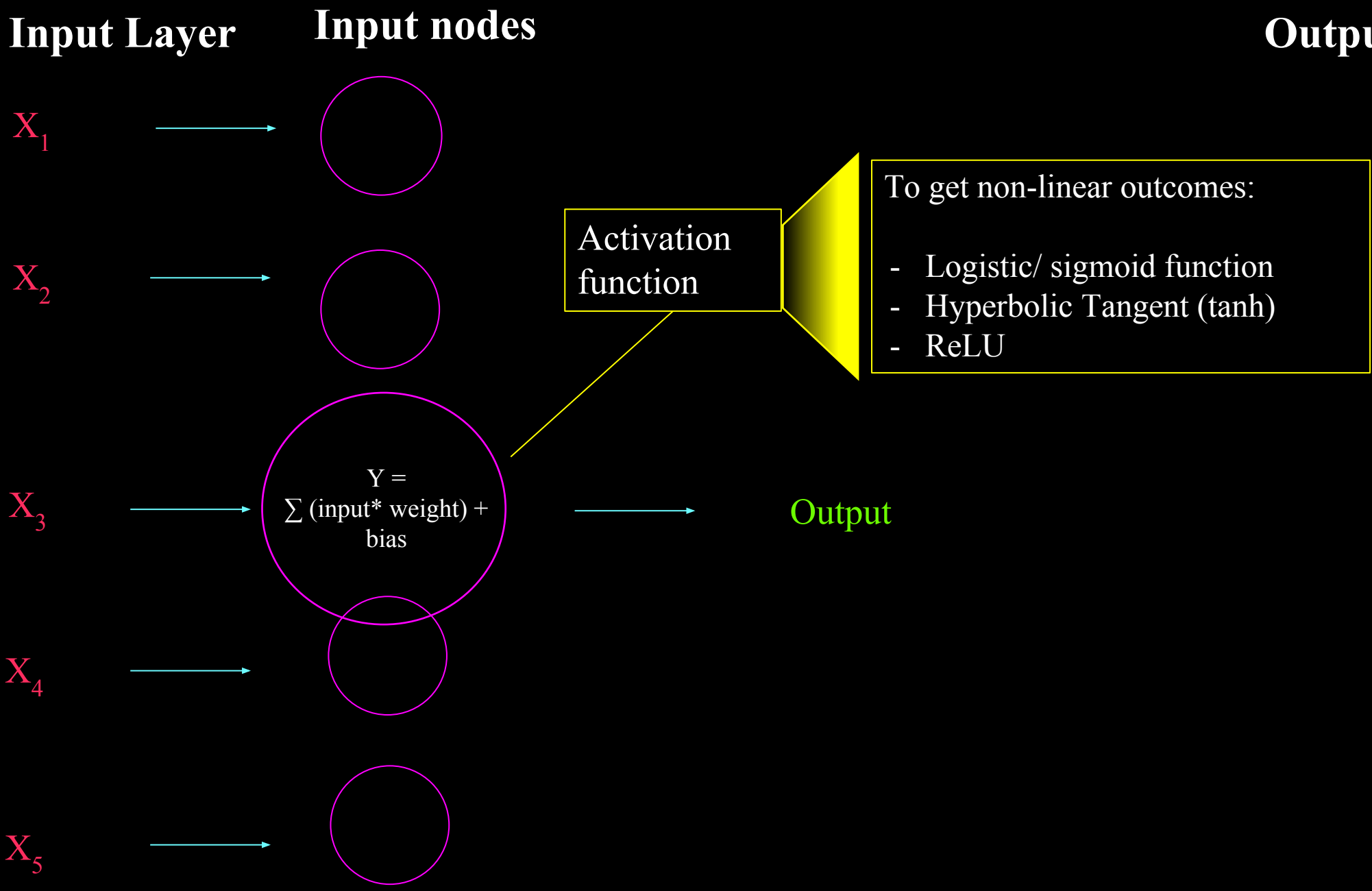
# Predictive Weak Signals Scanning

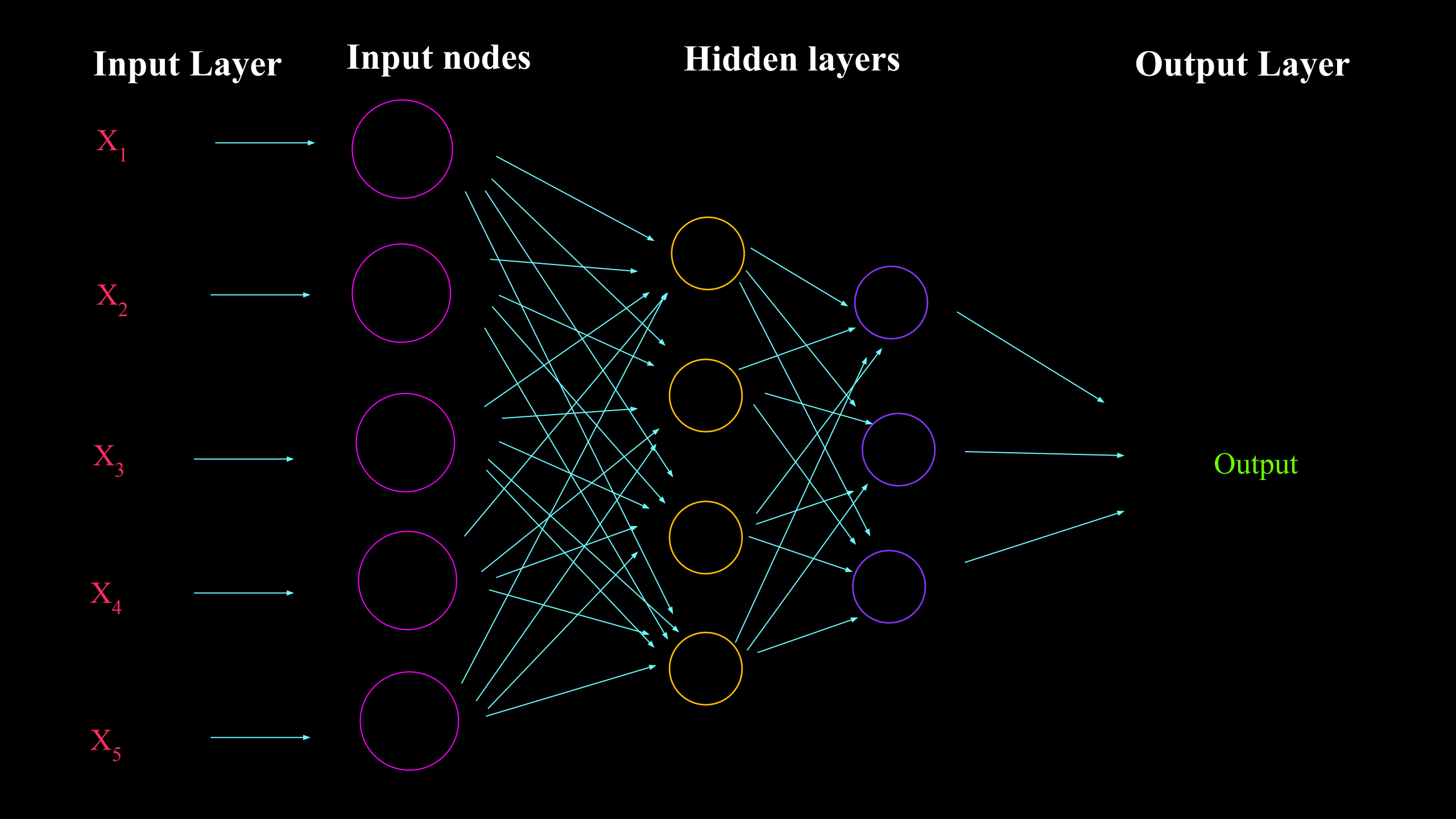
| | |
|---|---|
| 1. Determine outliers | Novelty and detection algorithms, discriminant analysis, ethnographic approaches, desk research or brainstorm |
| 2. Identify relationships to other variables | Use association rules to see how outliers are tied to more frequently occurring data. |
| 3. Identify emerging clusters and segments | Use co- occurrences to identify clusters or segments. Cluster Analysis (K-means, Hierarchical clusters ) |
| 4. Explore target segments | Capture behavioral and attitudinal data via surveys, web-scraping etc. to examine direction of outlier trend |

# Multilayer Perceptrons / Neural Networks




Input Layer
Input nodes
Hidden layers
Output Layer
X1
X2
X3
X4
X5
Output


Input Layer
Input nodes
Output Layer
$X_1$
$X_2$
$X_3$
$X_4$
$X_5$
Y = ∑ (input* weight) + bias
Activation function
To get non-linear outcomes:
- Logistic/ sigmoid function
- Hyperbolic Tangent (tanh)
- ReLU
Output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X1
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X3
X4
X5
Output

*In a time of drastic change it is the* (machine) *learners who inherit the future. The learned usually find themselves equipped to live in a world that no longer exists*

~ Eric Hoffer