



INTRODUCTION TO MACHINE LEARNING

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LIBRARIES

- numpy
- matplotlib
- pandas
- scikit-learn
- Karas
- Tensorflow
- ...





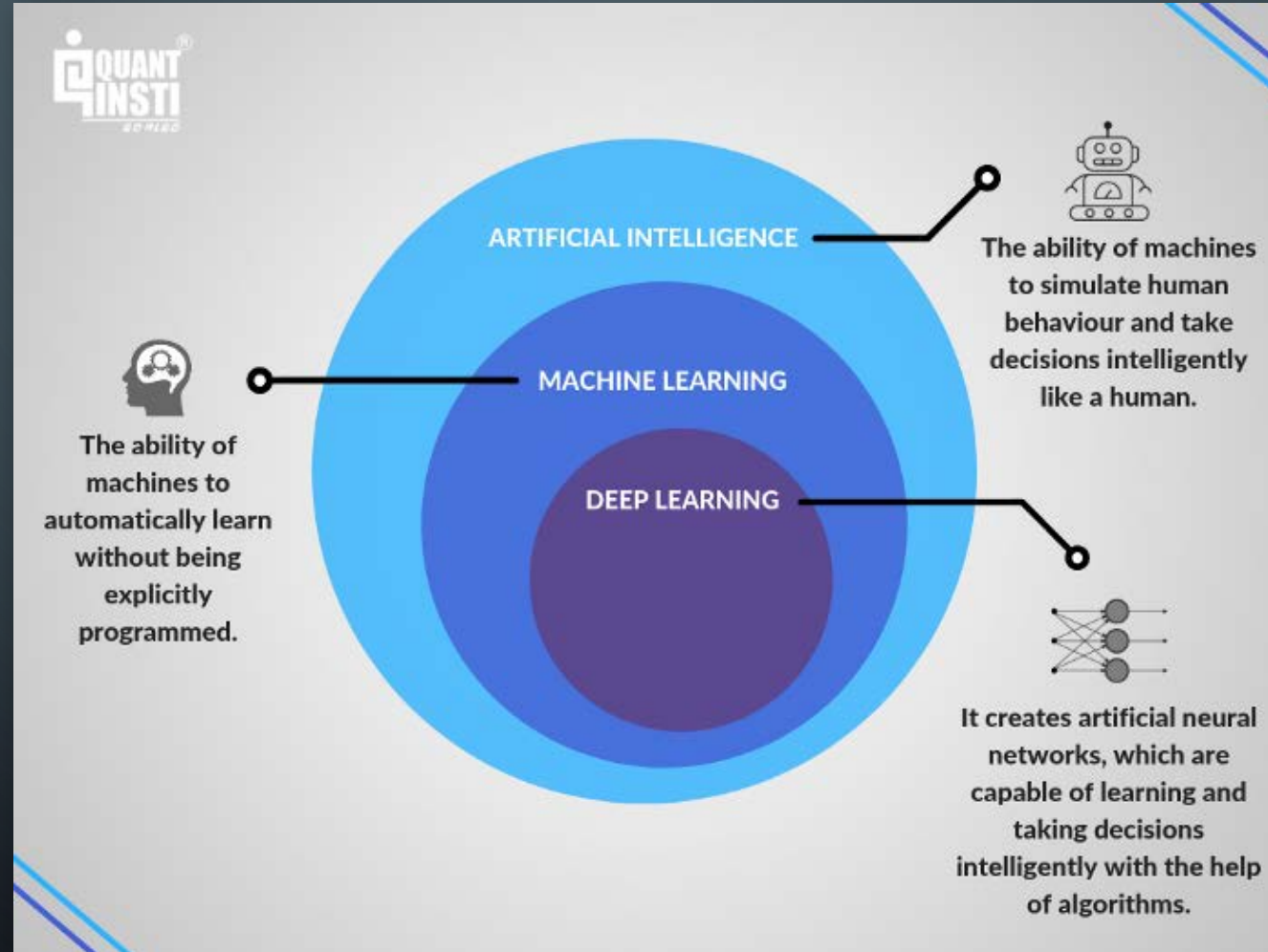
WHAT IS MACHINE LEARNING?

- Field of study that gives “computers the ability to learn without being explicitly programmed” (Arthur Samuel, 1959)
- A computer program is said to **learn** from experience E with respect to some class of task T and performance measure P , if its performance at task T , as measured by P , improves with experience E . (Tom Mitchell 1997)

WHAT IS MACHINE LEARNING?



WHAT IS MACHINE LEARNING



USAGES



Detection

Text & Speech

Image
interpretation

Human behavior &
identity

Abuse & Fraud

Prediction

Recommendations

Individual
behavior &
condition

Collective behavior

Generation

Visual art

Music

Text

Design

TYPES OF MACHINE LEARNING

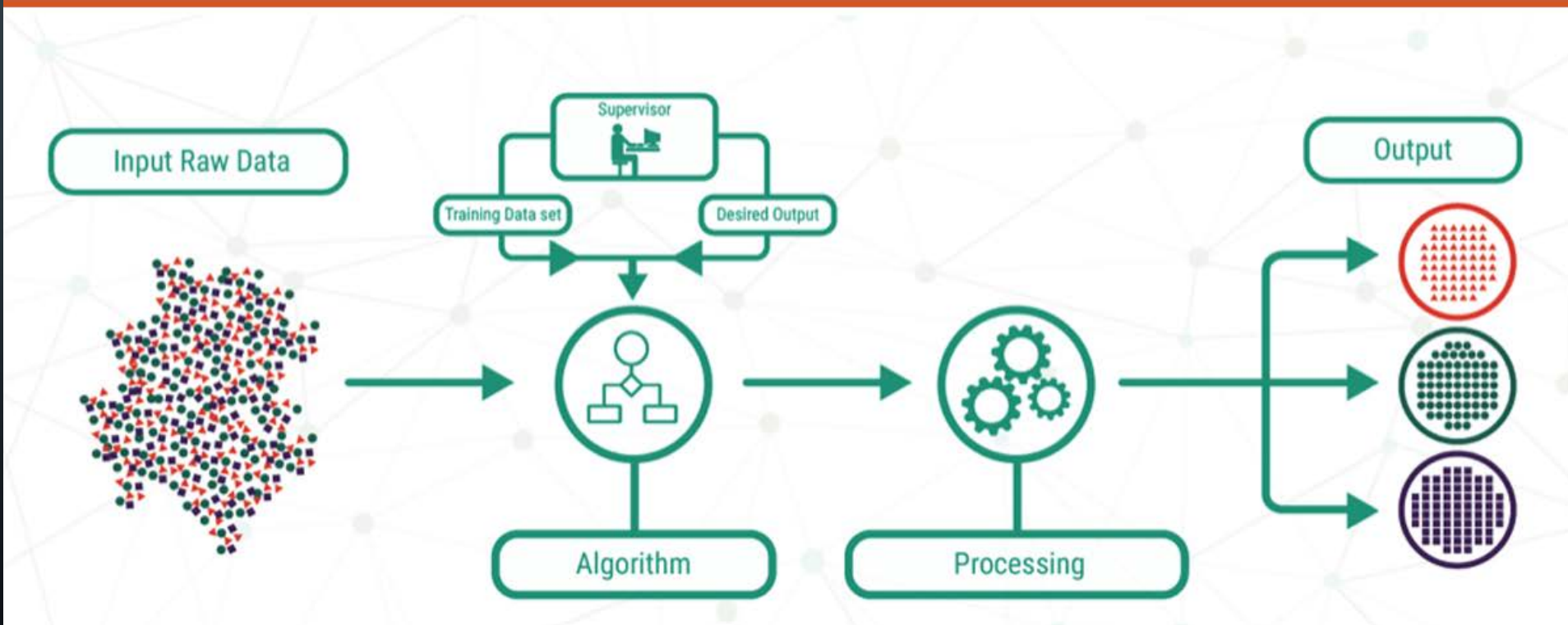
- Supervised Learning
- Unsupervised Learning
- Semi-Supervised Learning
- Reinforcement Learning



SUPERVISED LEARNING



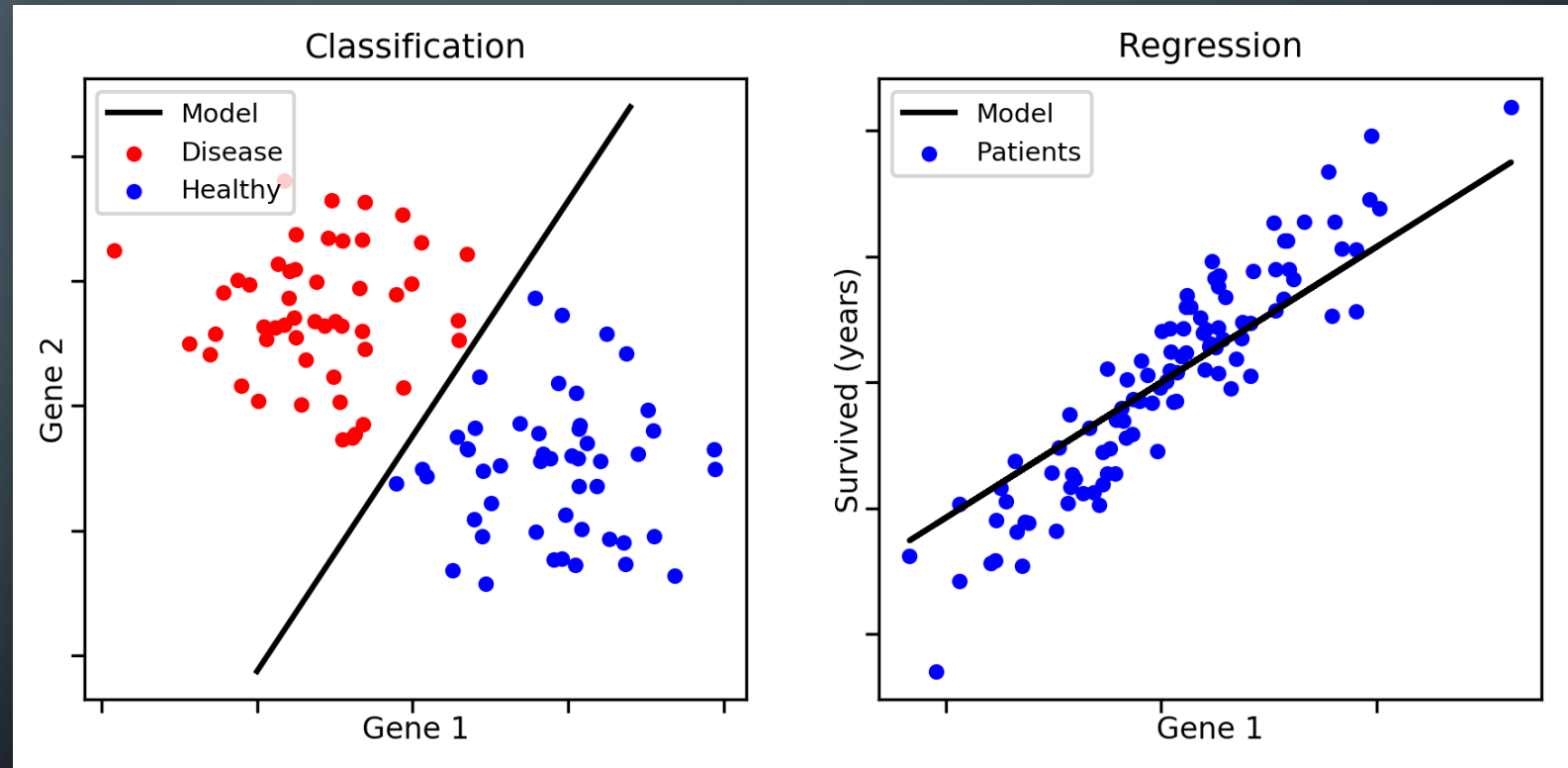
Supervised Learning



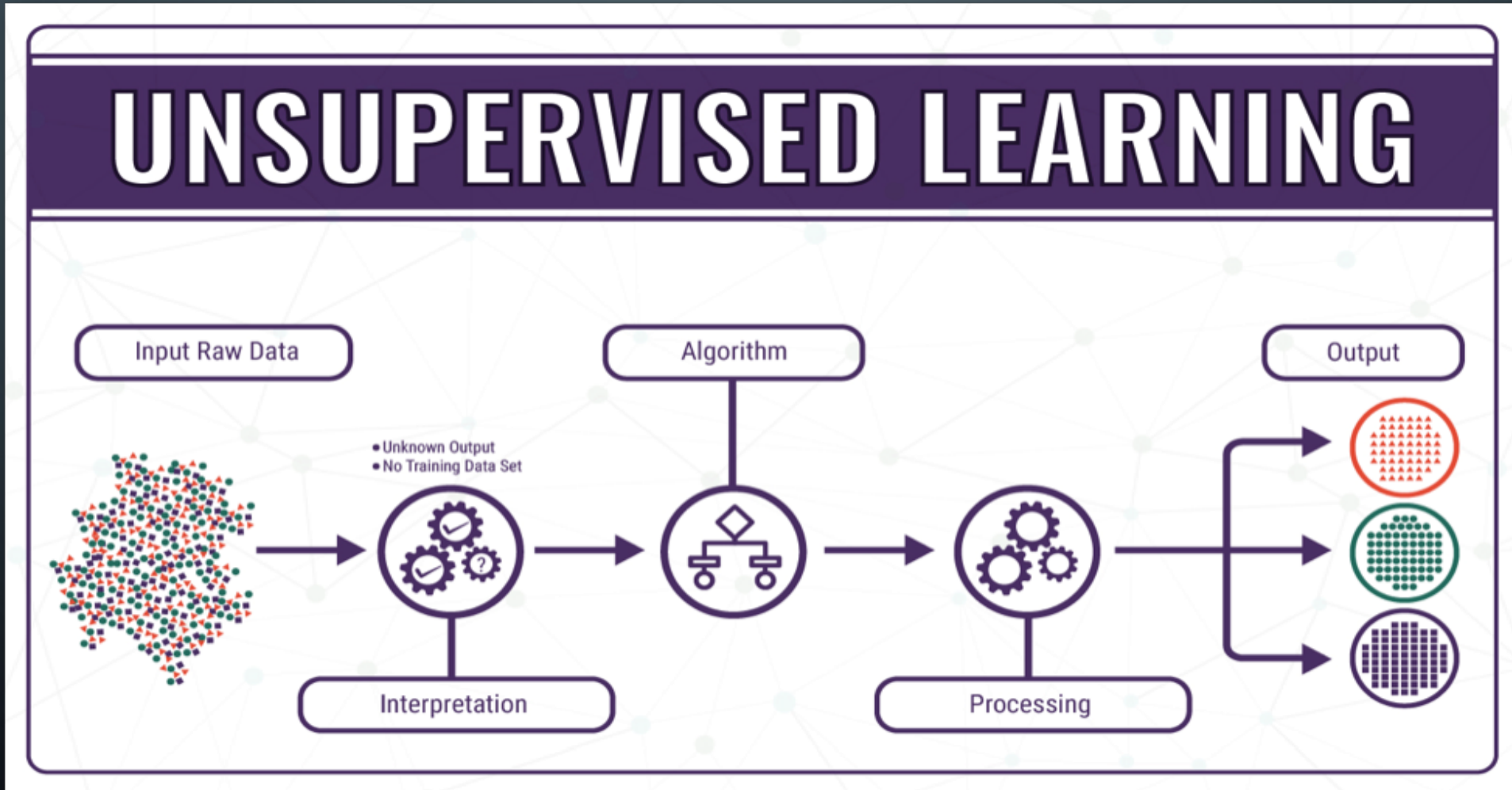
SUPERVISED LEARNING



- Regression
- Classification

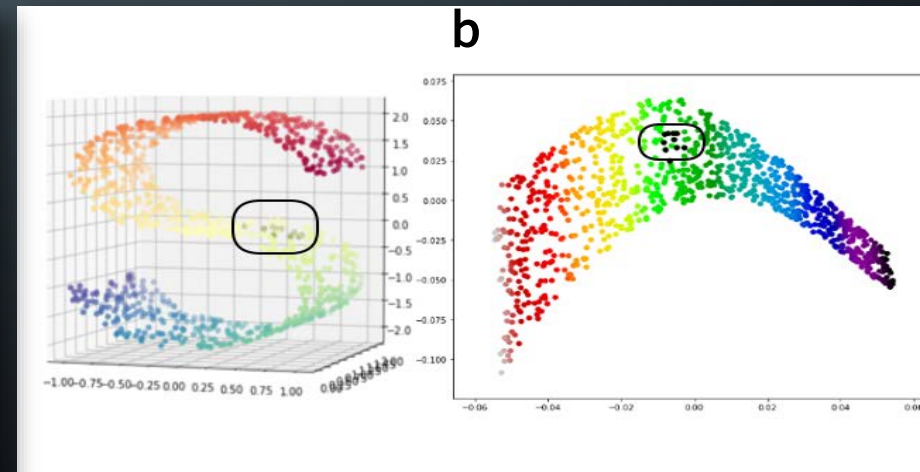
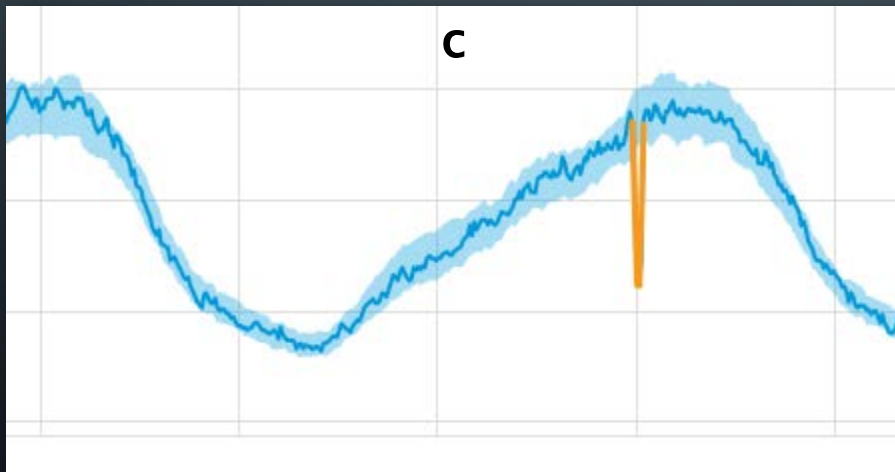
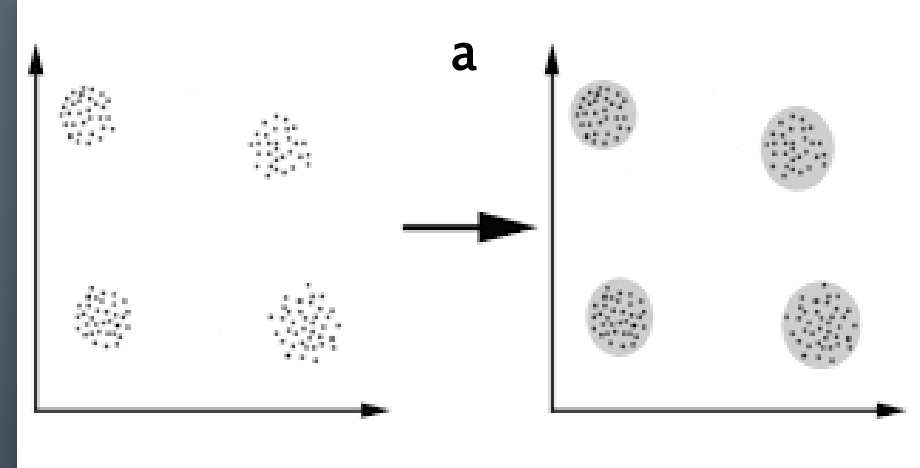


UNSUPERVISED LEARNING

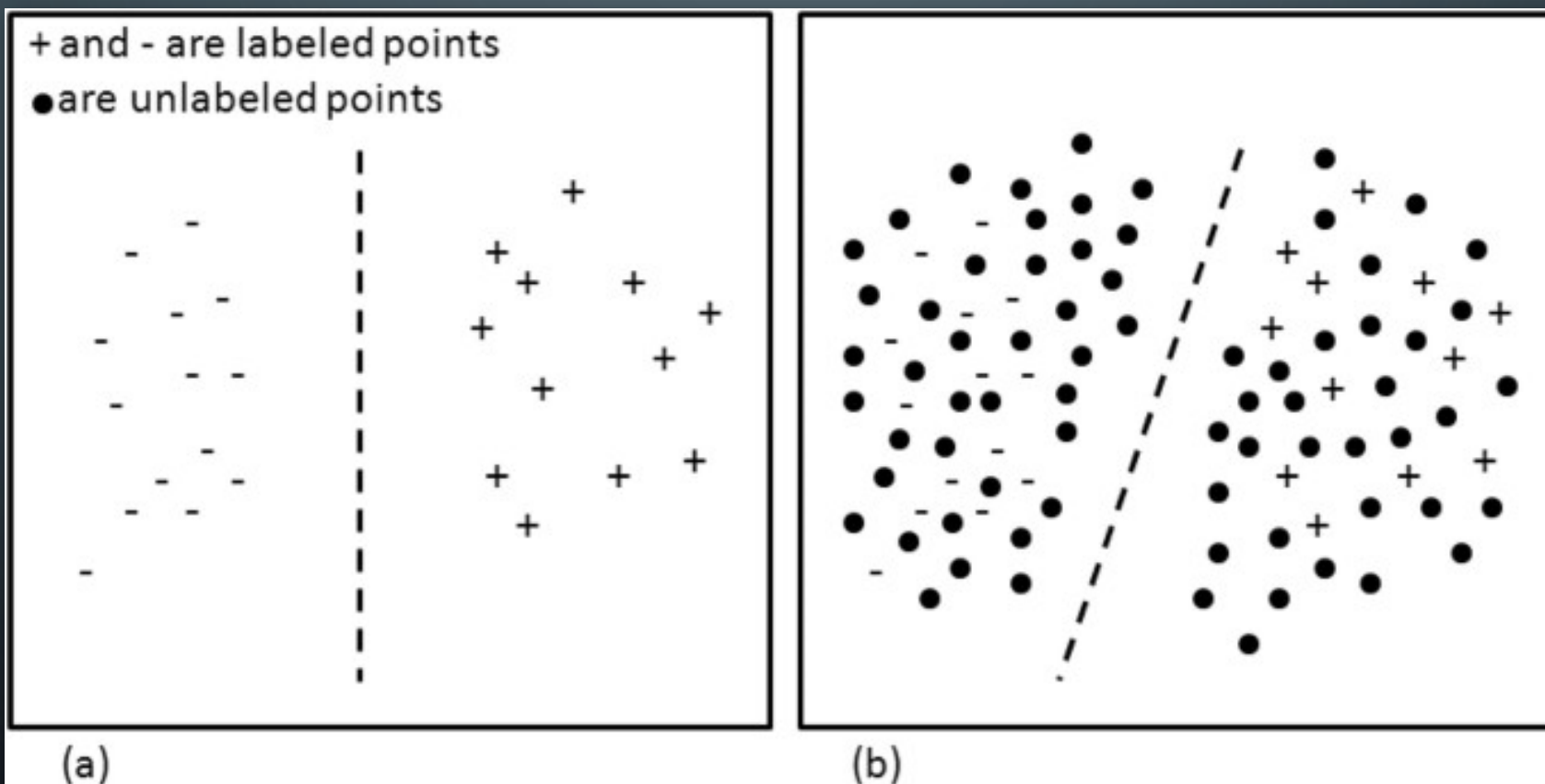


UNSUPERVISED LEARNING

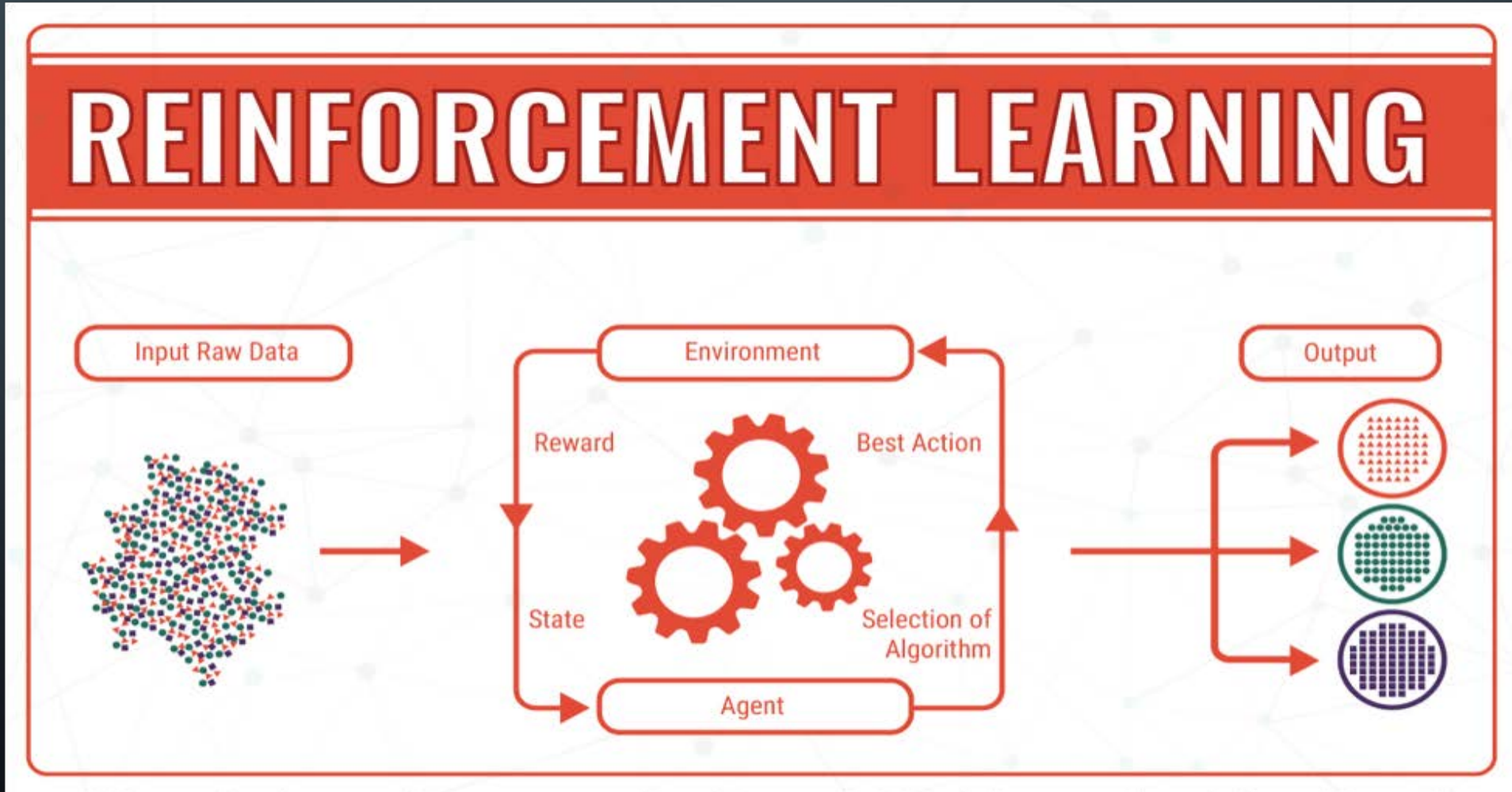
- Clustering
- Dimensionality Reduction
- Anomaly Detection



SEMI-SUPERVISED LEARNING



REINFORCEMENT LEARNING



WHY ML? WHERE?



- You don't know what you are looking for
- You can't write program explicitly
- You can write program explicitly but performance is not satisfactory
- Data is dynamic and it changes over time
- There is more than one solution