Big Data Analytics in Healthcare

출처 : https://www.udacity.com/

강좌 찾기

UDACITY

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Courses and Nanodegree Programs

Healthcare

CATEGORY

- All
- Android
- Artificial Intelligence
- Data Analytics
- Data Science
- Deep Learning
- Developer Essentials
- Digital Marketing
- Georgia Tech Masters in CS
- iOS

Health Informatics in the Cloud

Beginner

This survey course provides a broad, forward-facing overview of contemporary health informatics within the context of the US healthcare delivery system.

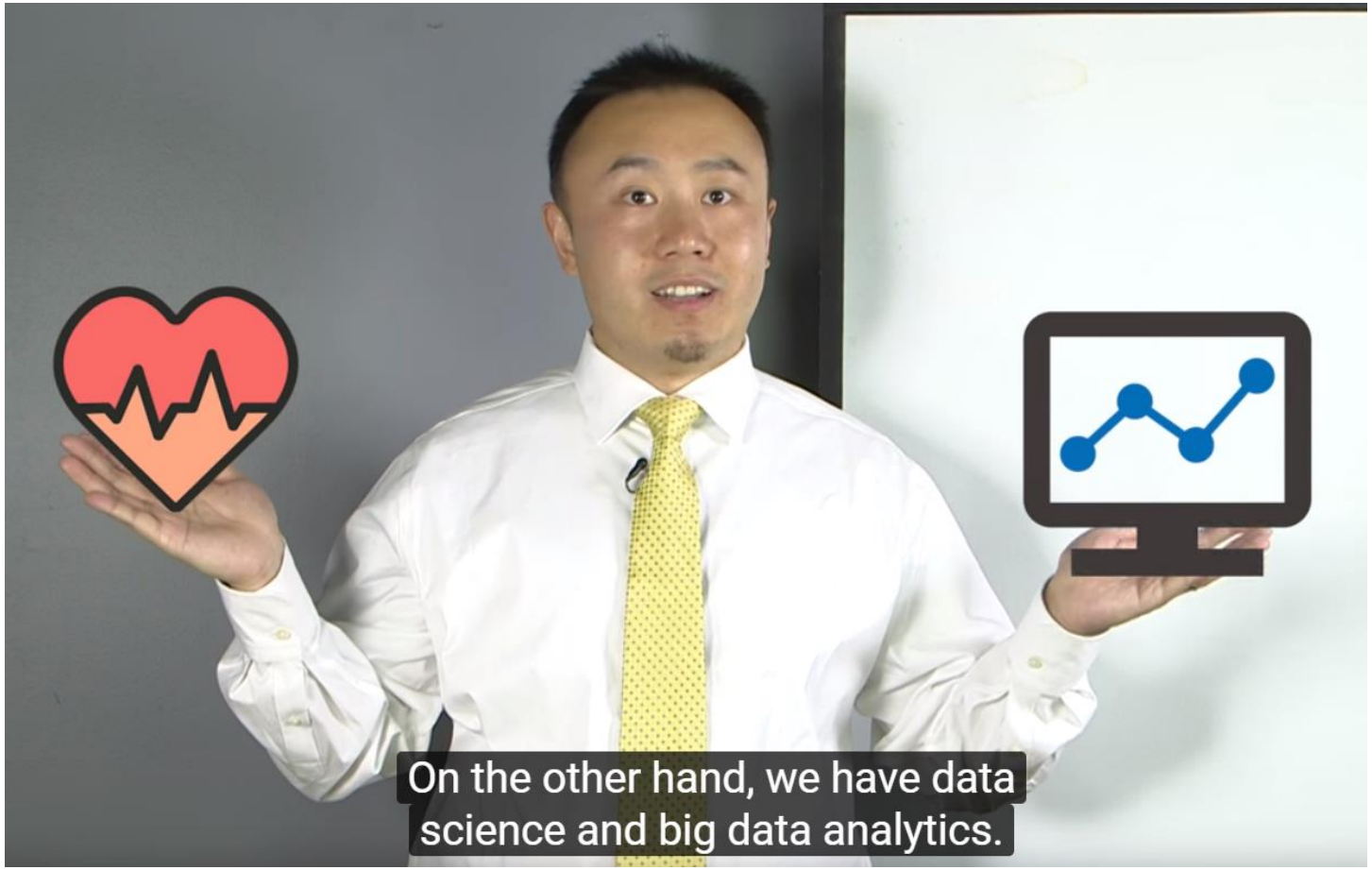
IN COLLABORATION WITH: **Georgia Institute of Technology**

Big Data Analytics in Healthcare

In this course, we introduce the characteristics of medical data and associated data mining challenges on dealing with such data. We cover various algorithms and systems.

IN COLLABORATION WITH: **Georgia Institute of Technology**

Lesson 1: Introduction to Big Data



주로 다룰 주제

1. Healthcare 데이터와 관련 어플리케이션

2. 데이터 과학과 빅데이터 분석
   - 데이터 알고리즘
   - 처리를 위한 시스템
   - 빅데이터 분석 방법
3. 위의 두 주제의 상호관련성과 적용방법

Lesson 1: Introduction to Big Data

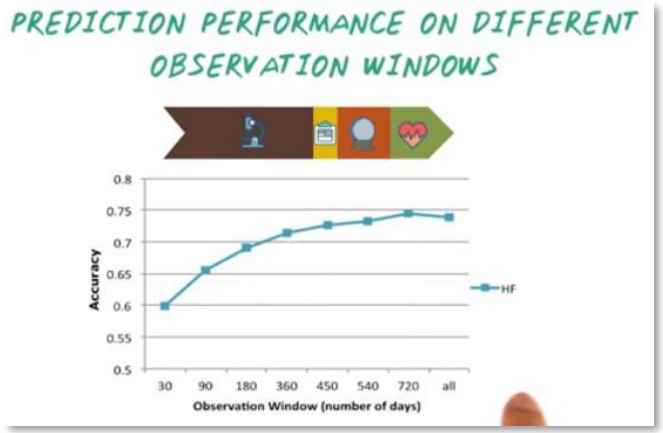
이 강좌의 목표

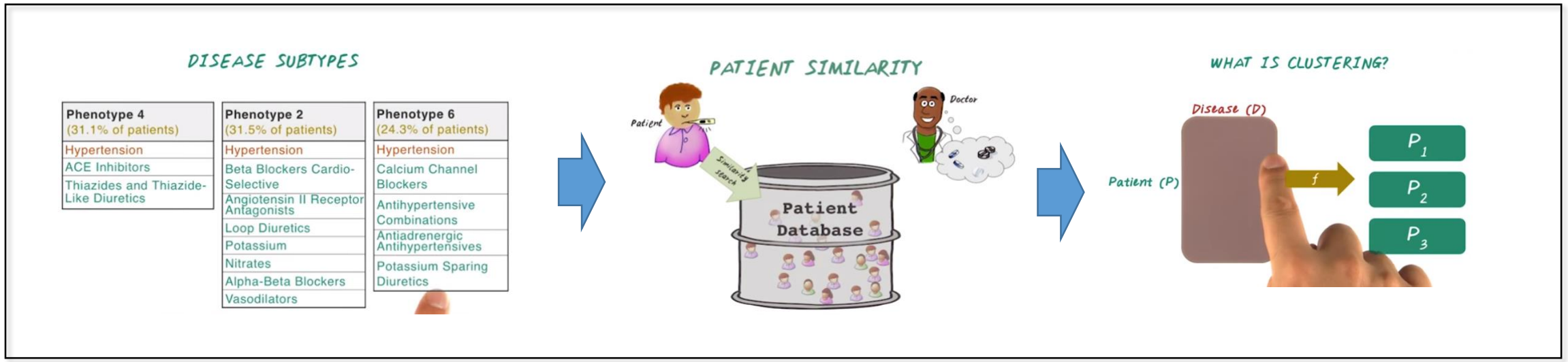
1. Healthcare 데이터 이해
2. 분석 알고리즘 이해
3. 빅데이터 시스템 이해

Lesson 1: Introduction to Big Data

이 강좌를 마치고 난후의 기대 효과
=> Healthcare 데이터에 기반한 모델을 구축할 수 있다.

예를 들면,
개별 질병 위험 예측 모델
공통된 특징이 있는 환자 군집에 따른 치료 추천



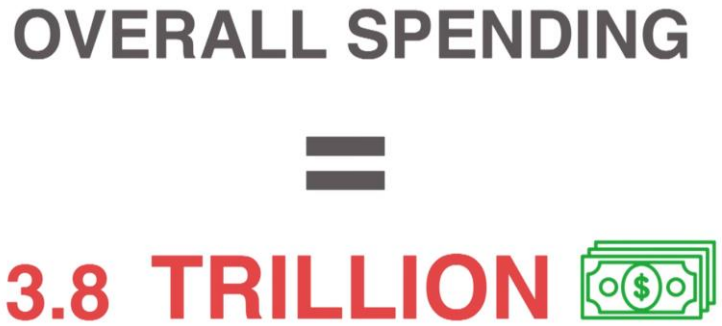


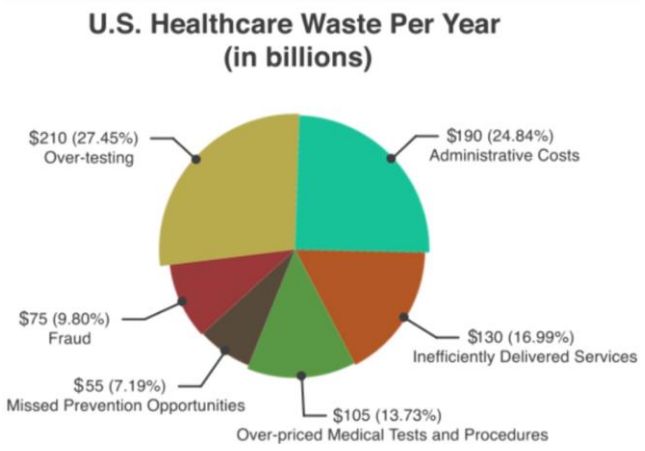
Lesson 1: Introduction to Big Data

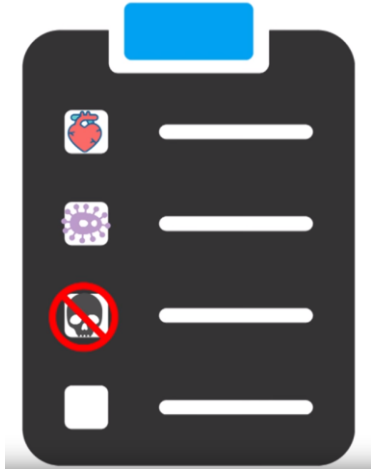
- 현재 Healthcare분야에서의 문제점

1. 미국의 한해 3.8조달러로 건강관리에 소비
2. 이중에서 7,650억 달러가 낭비
3. 예방 가능한 사망자가 연간 200 ~ 40000건 발생 (사망원인 3위)

=> 비용은 높고 낭비가 많고 효율이 낮음.







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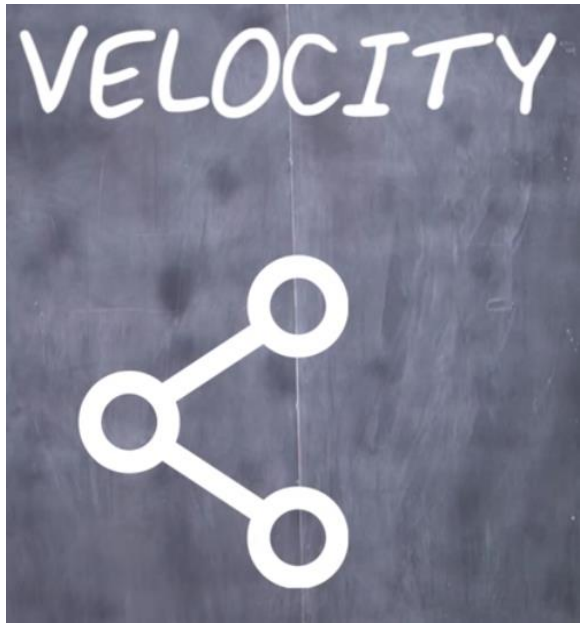
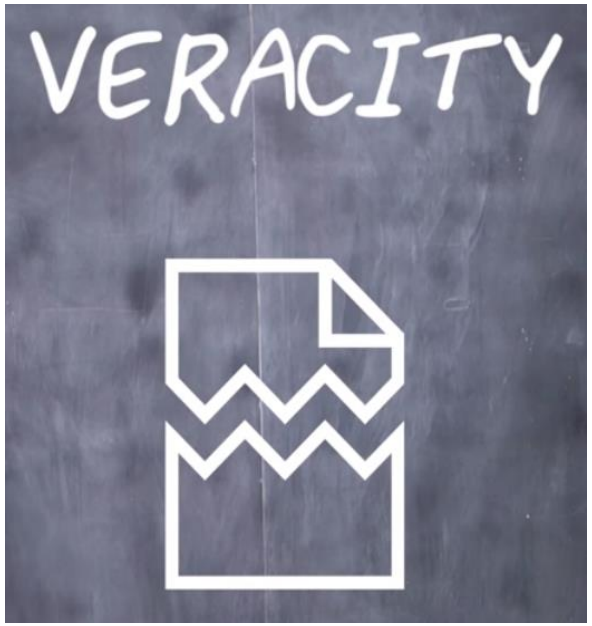
- 빅데이터의 4가지 특징 (4 V)





Lesson 1: Introduction to Big Data

Data Scientist: The Sexiest Job of the 21st Century

by Thomas H. Davenport and D.J. Patil

FROM THE OCTOBER 2012 ISSUE

Who Are These People?

If capitalizing on big data depends on hiring scarce data scientists,

, what data scientists do is make discoveries while swimming in data. I

Data scientists realize that they face technical limitations, but they don't allow that to bog down their search for novel solutions. As they make discoveries, they communicate what they've learned and suggest its implications for new busi

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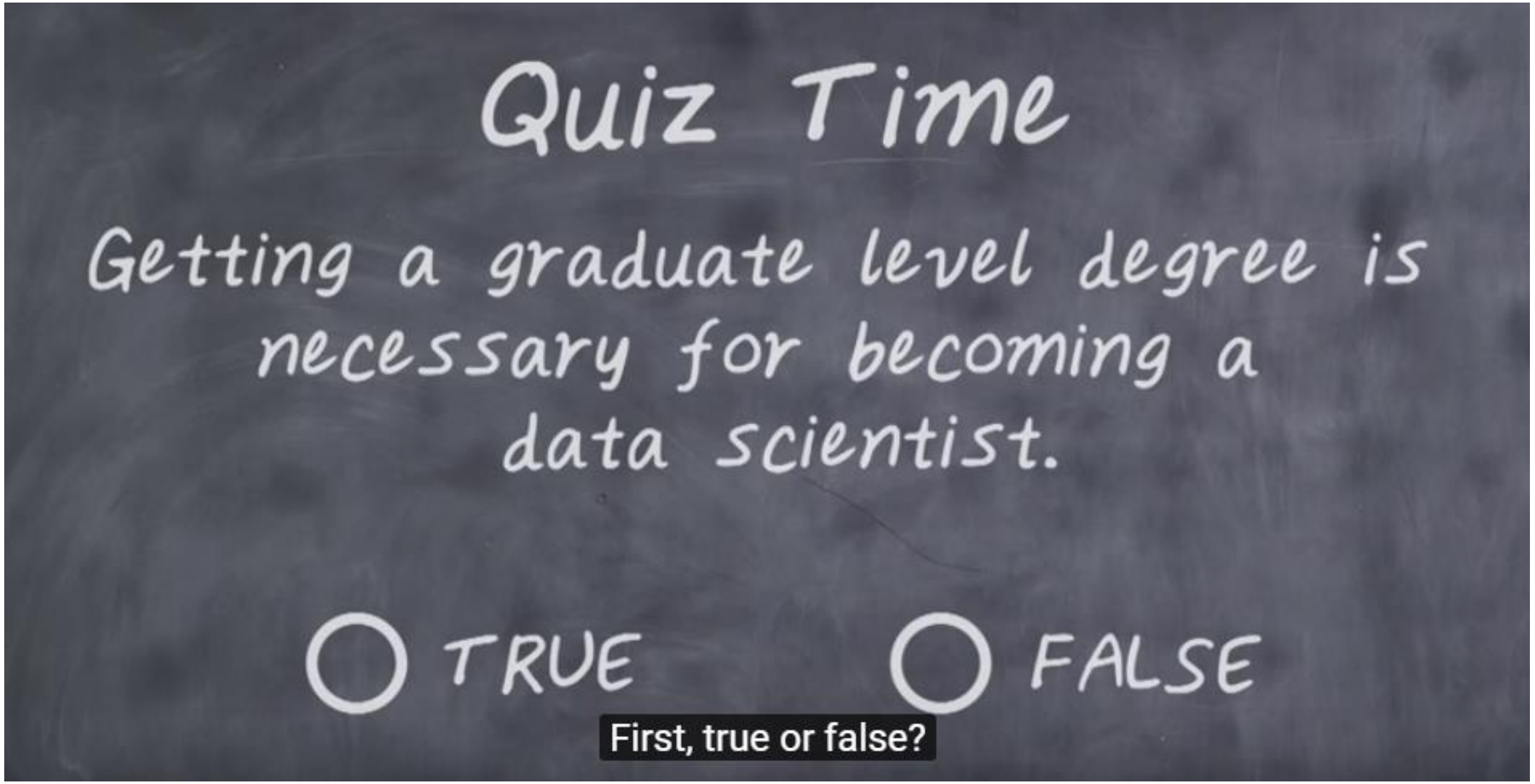

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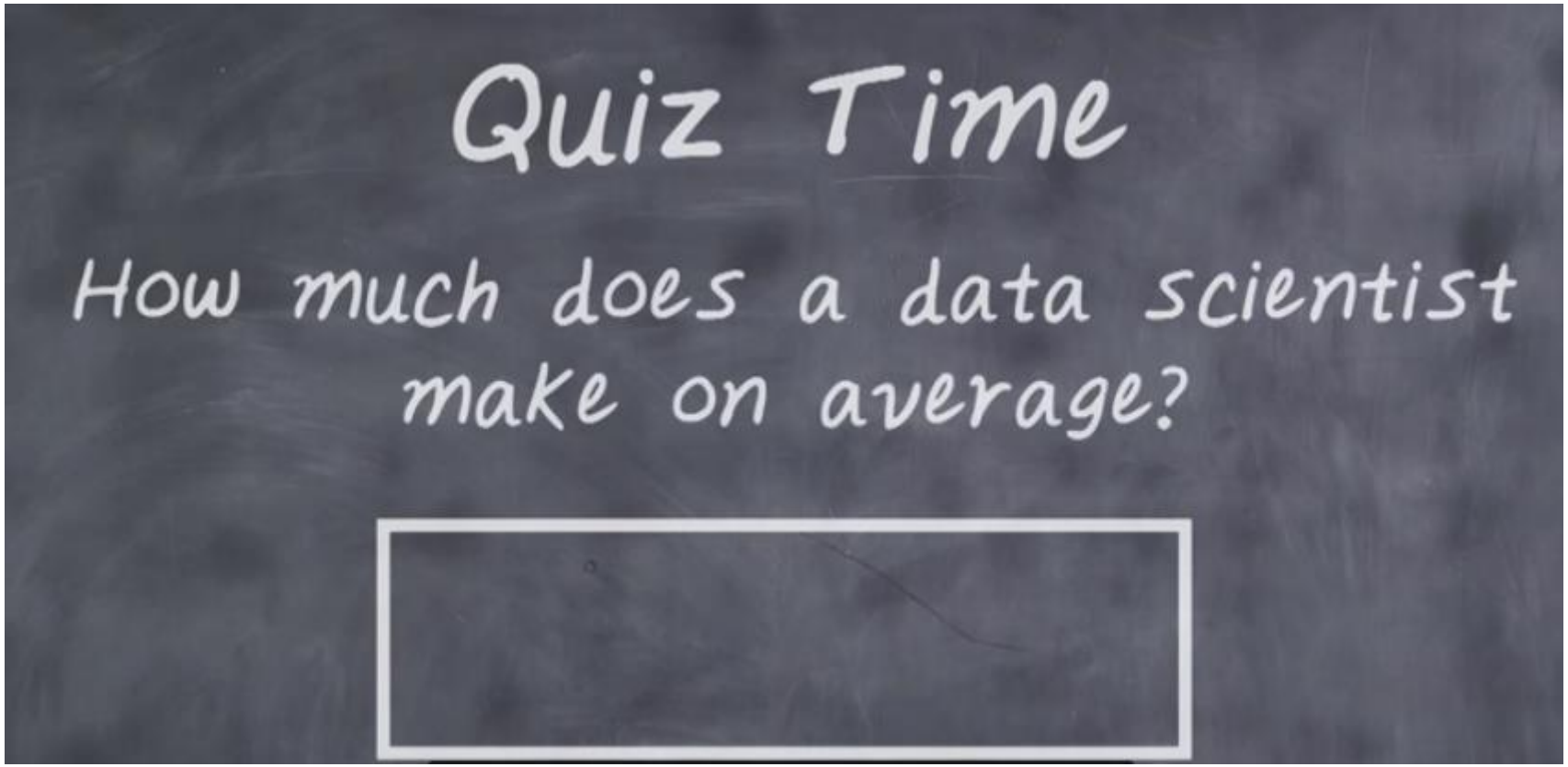

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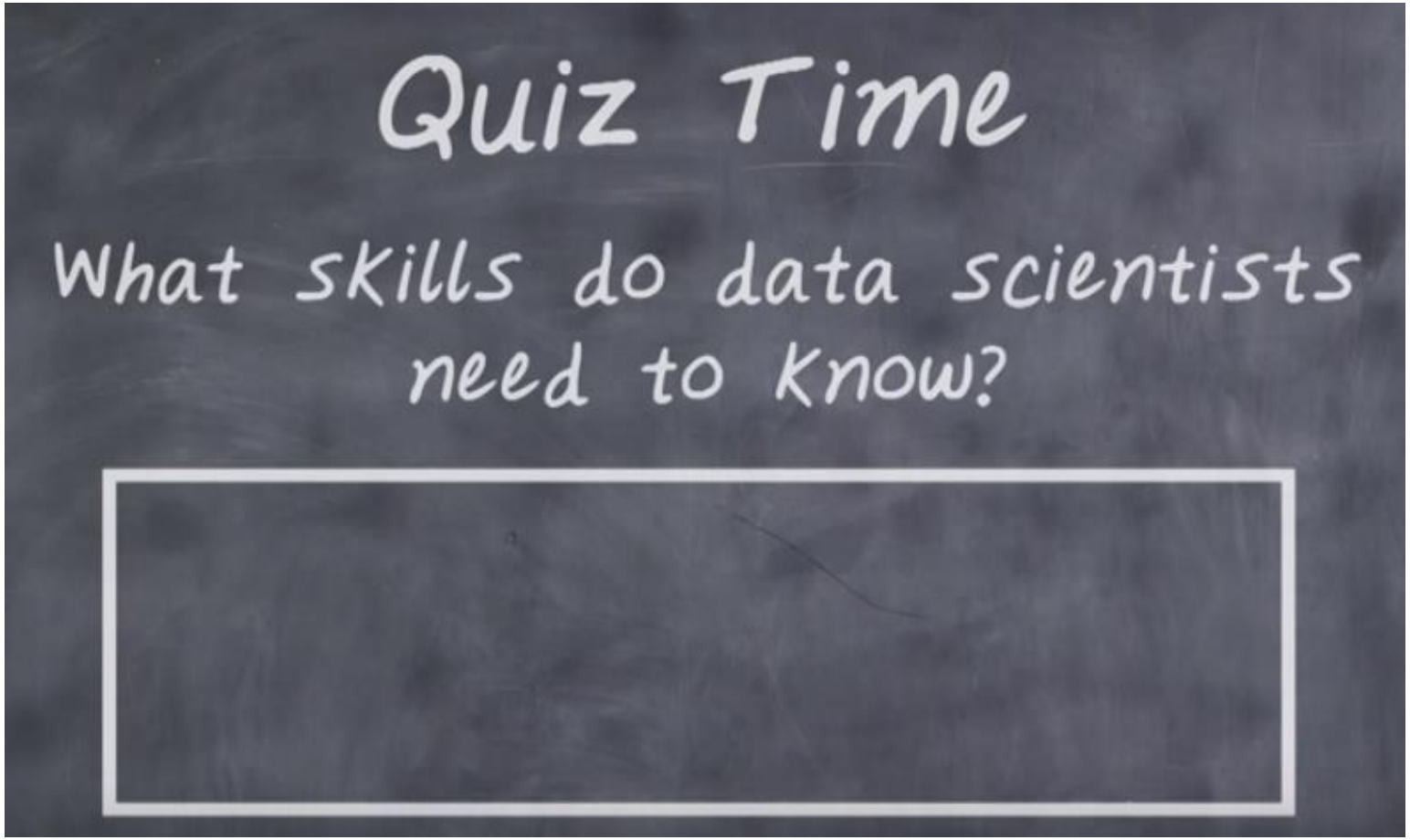

Lesson 2: Big Data Course Overview

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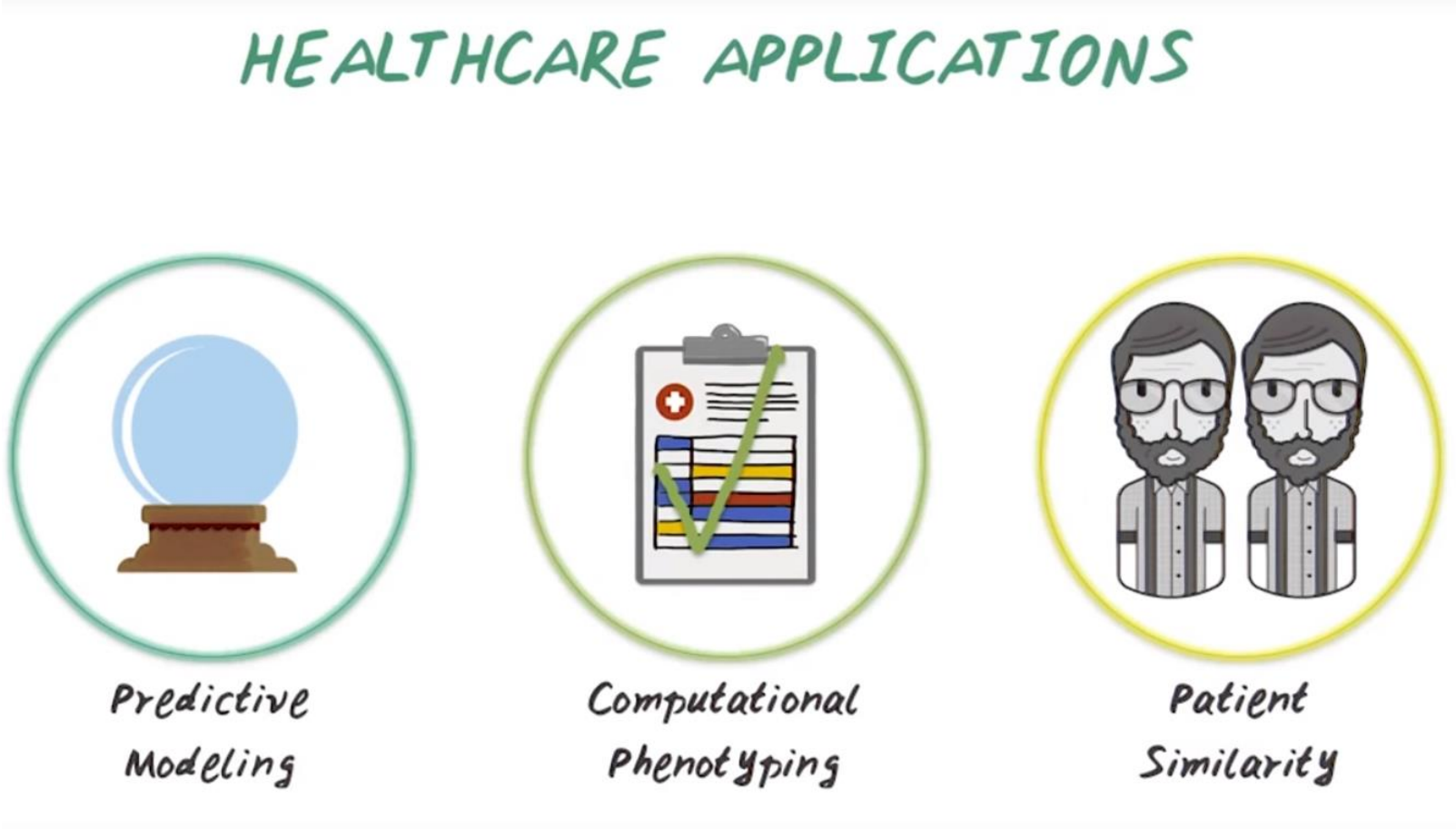

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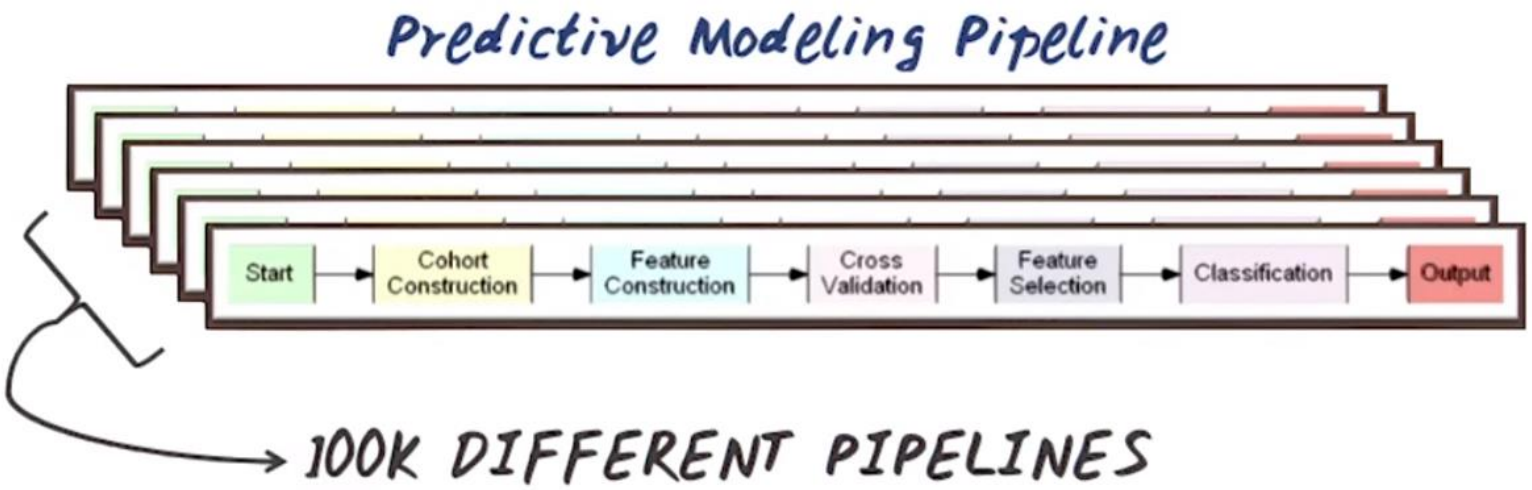
예측 모델 CHALLENGES

So many models!



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HEALTHCARE APPLICATIONS

Computational Phenotyping

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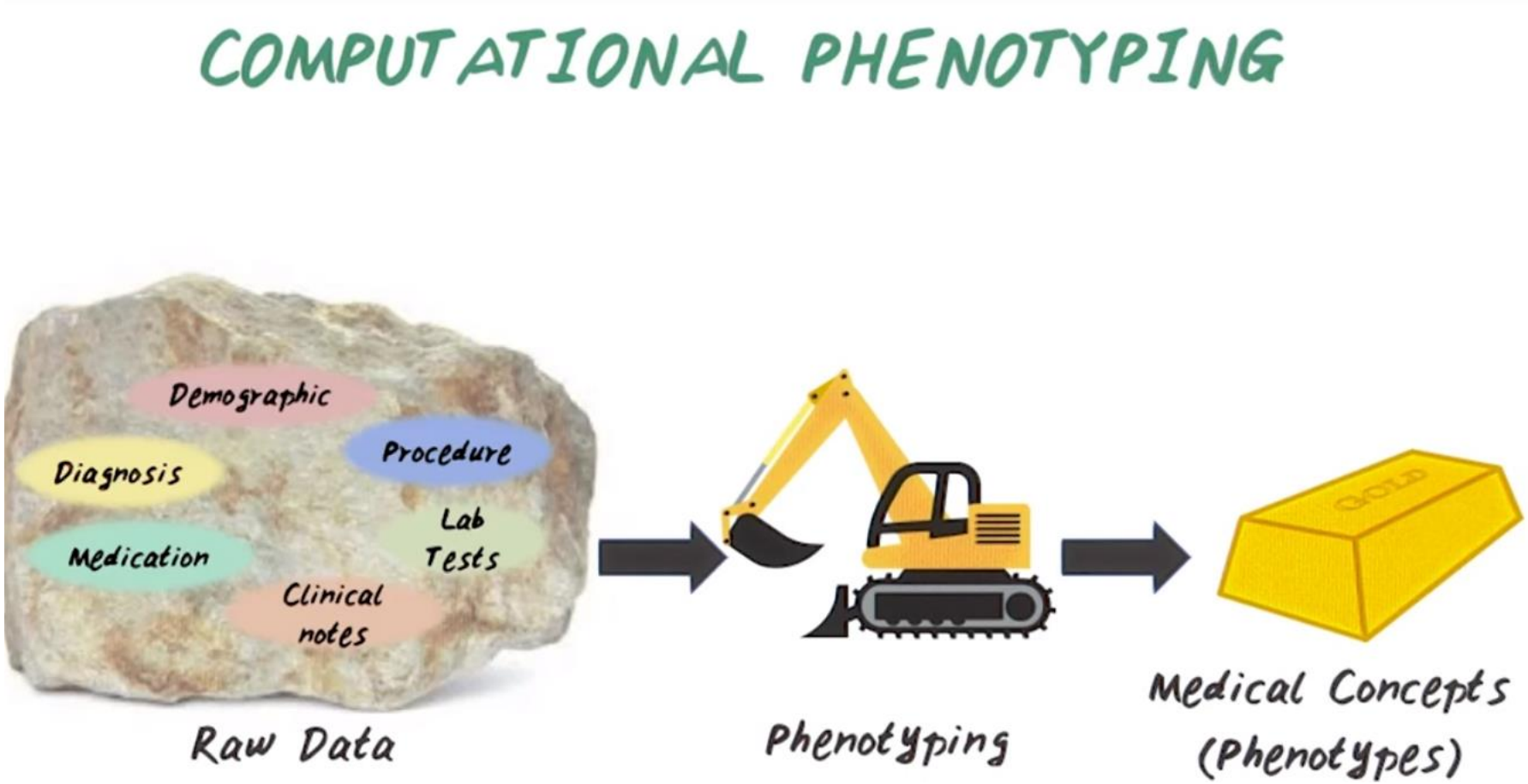

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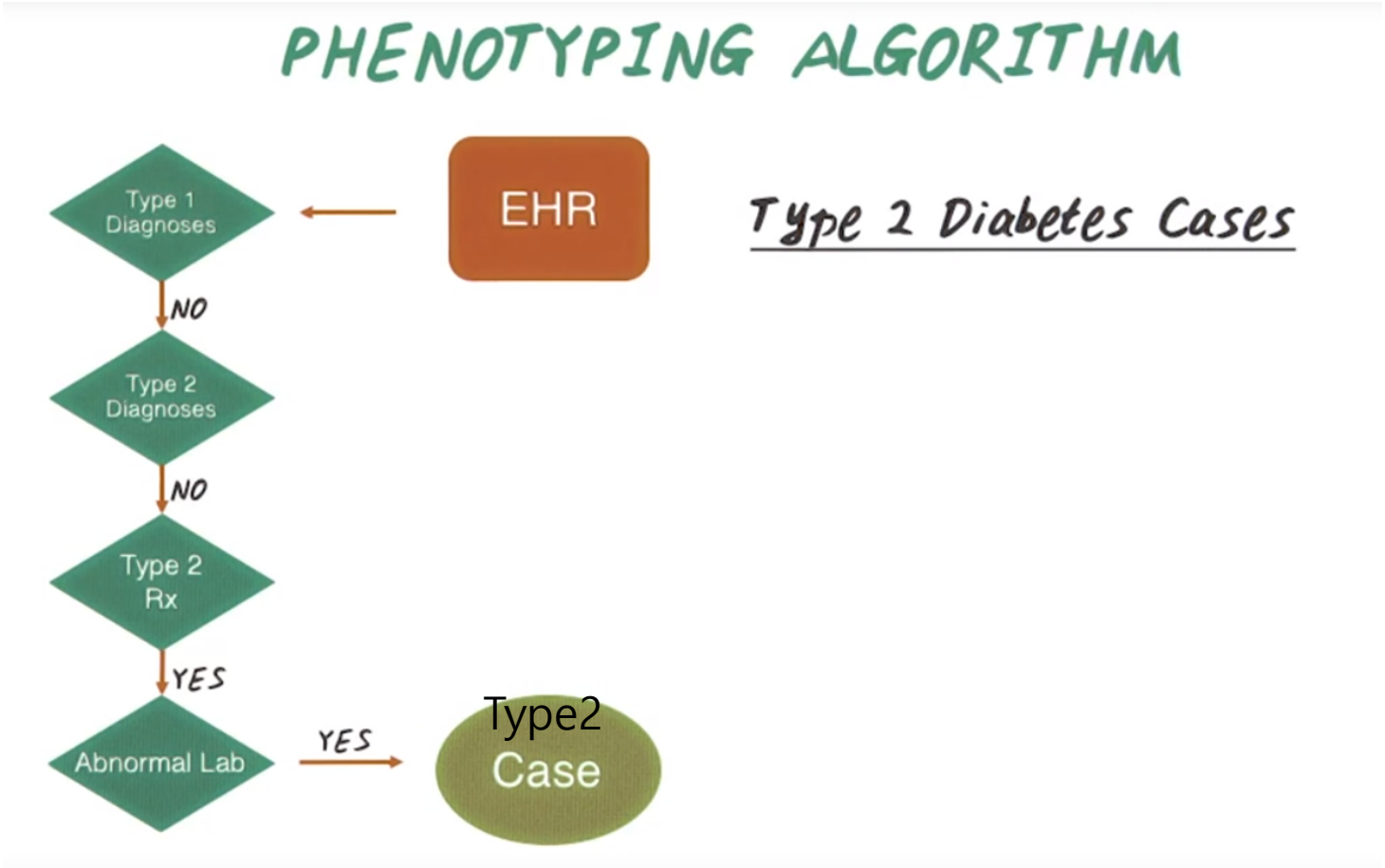

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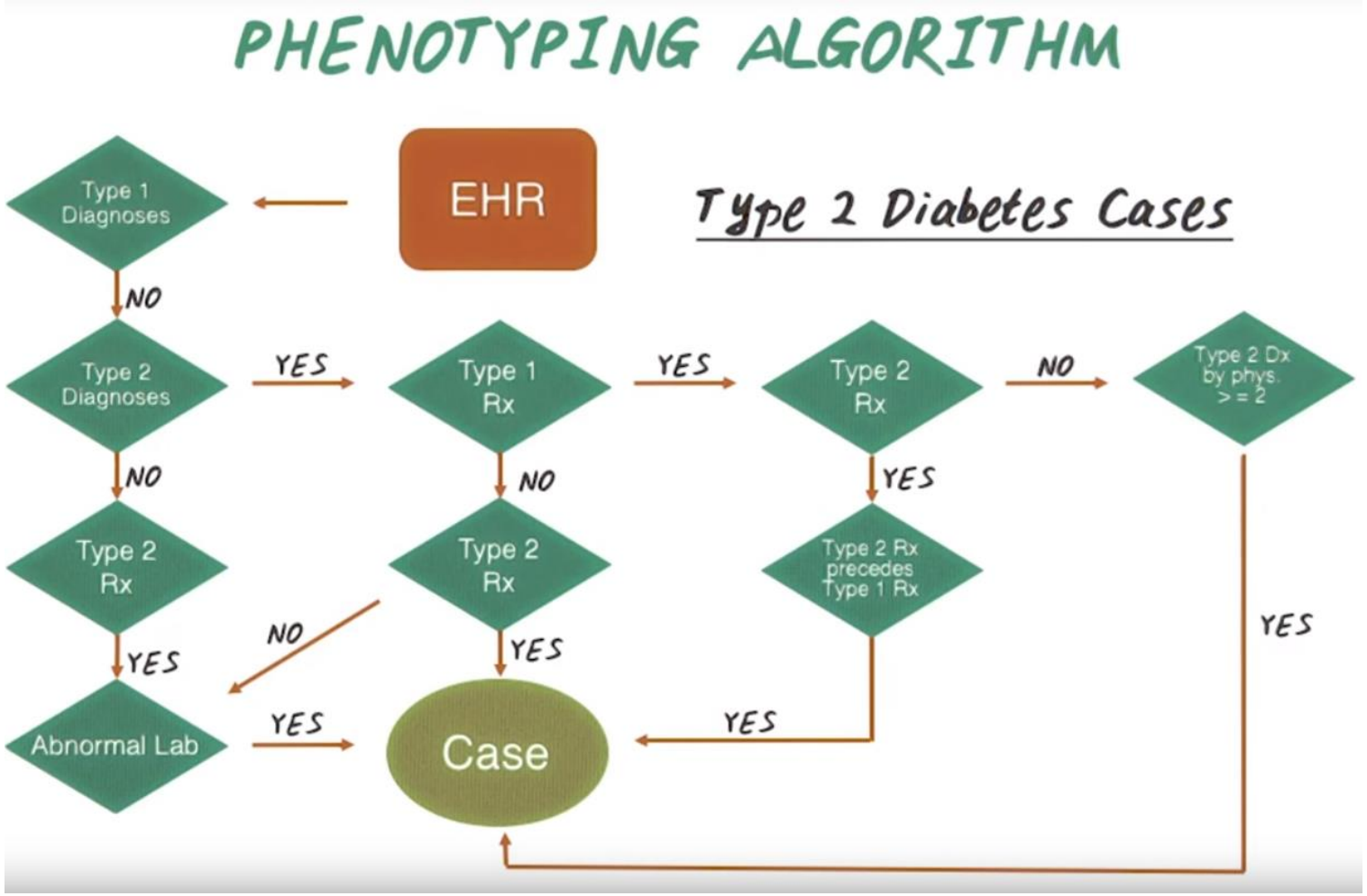

이렇게 복잡한 알고리즘이 필요한 이유

⇒ EHR 데이터가 매우 실뢰할 수 없기 때문

⇒ Missing Data, 중복 Data

빅데이터 시스템을 사용해서 이와 같은 알고리즘을 효율적 개발하는 것을 배울 것임.

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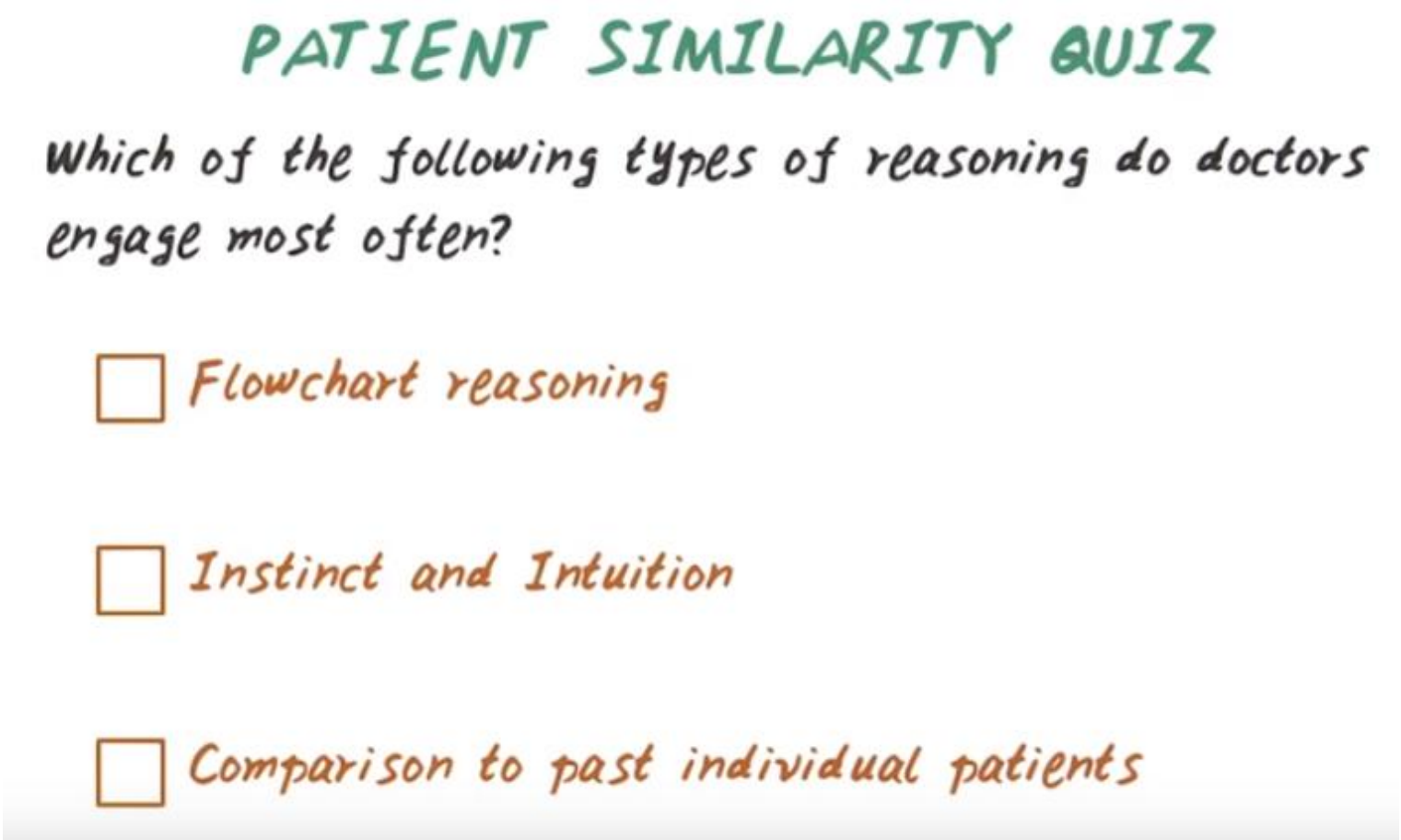

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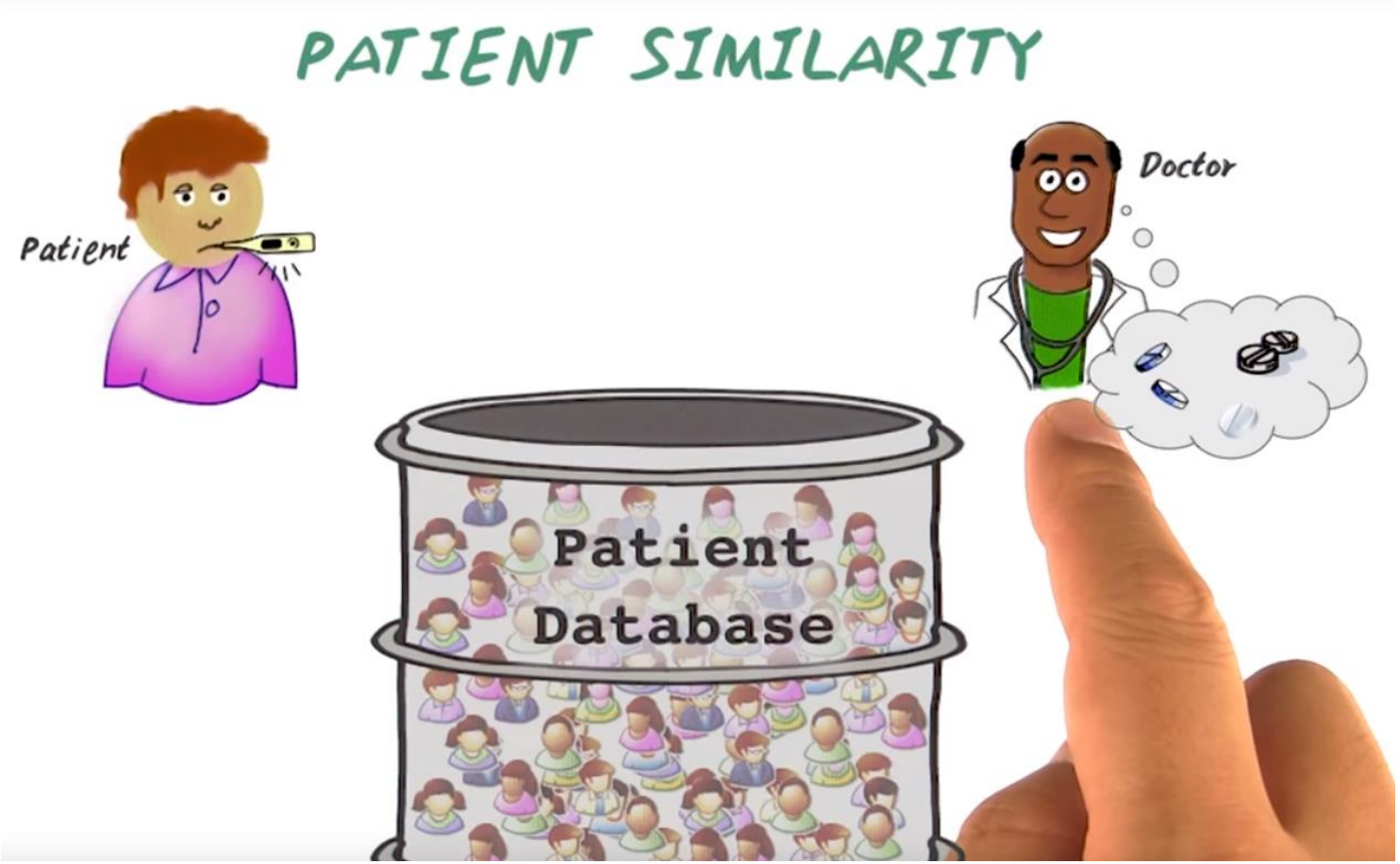

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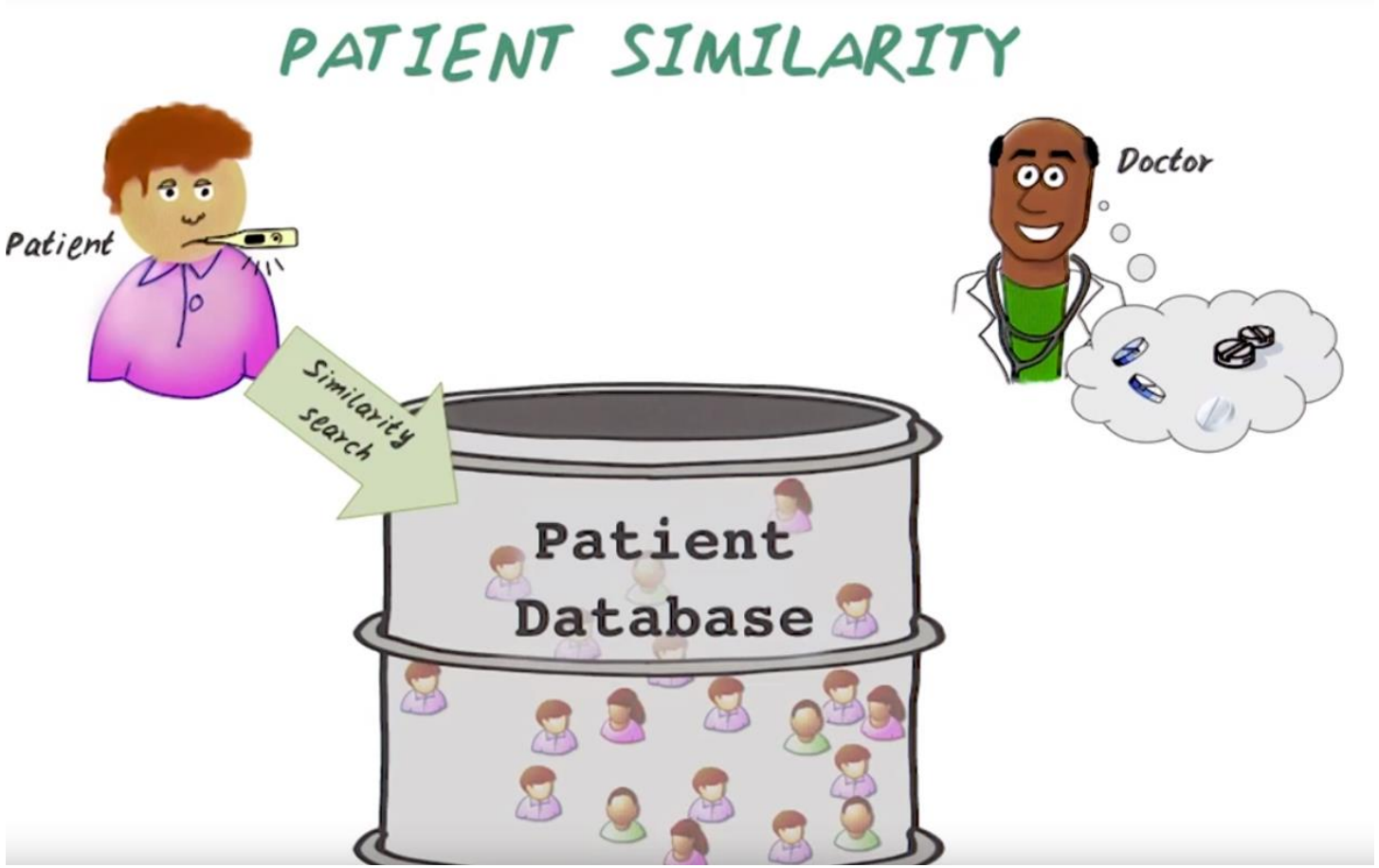

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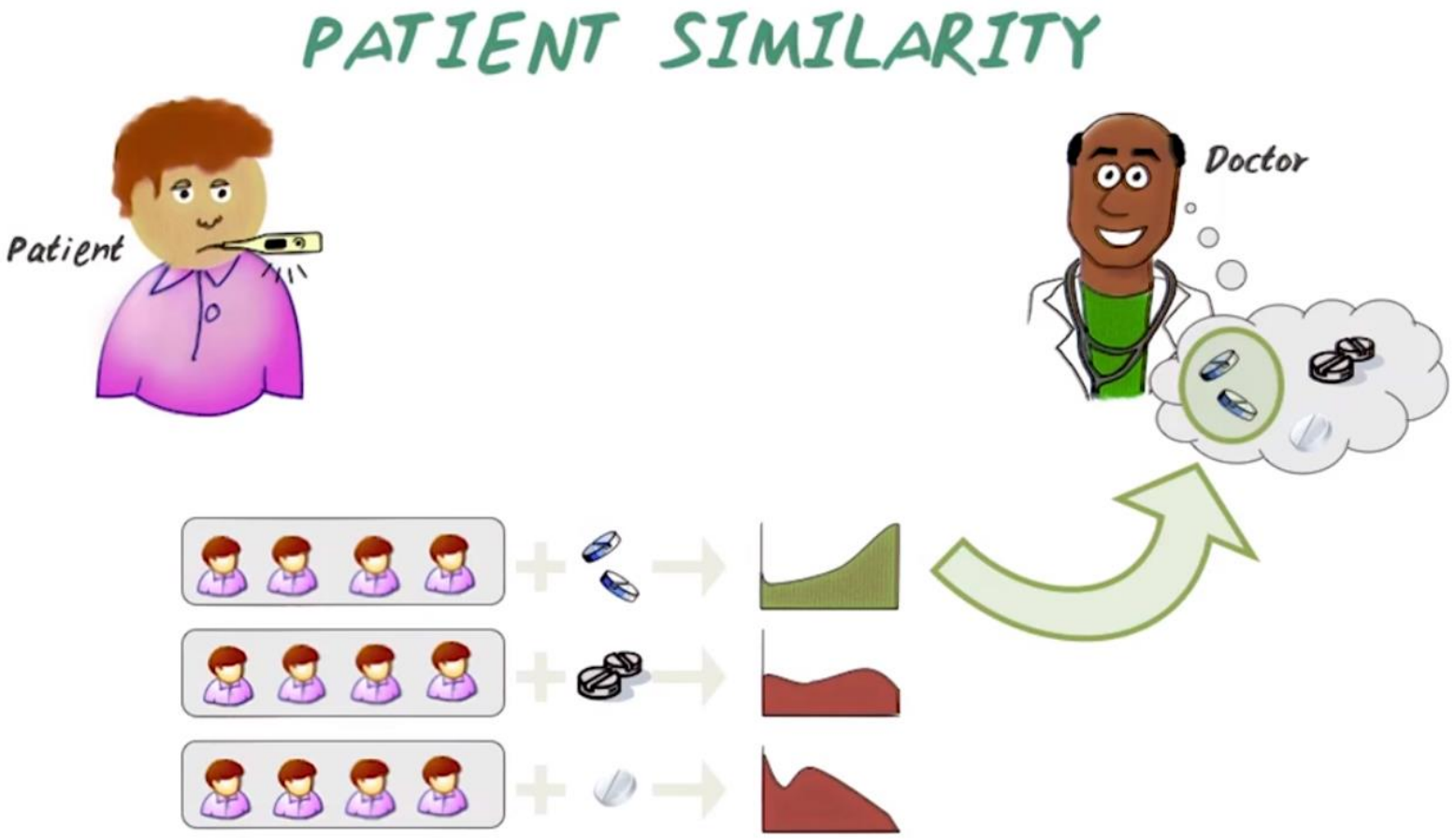

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BIG DATA ALGORITHMS

- Classification
- Clustering
- Dimensionality reduction
- Graph analysis

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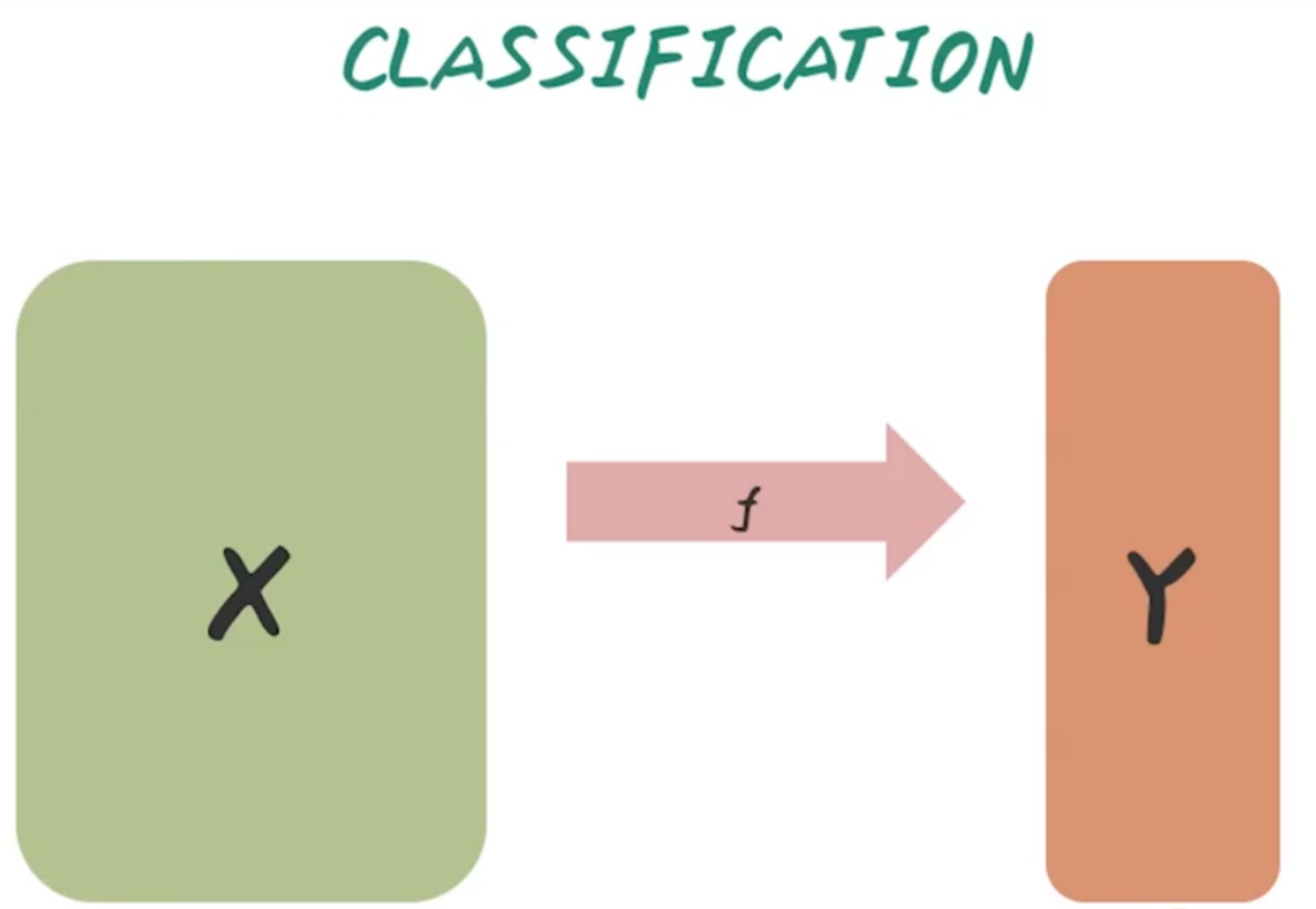

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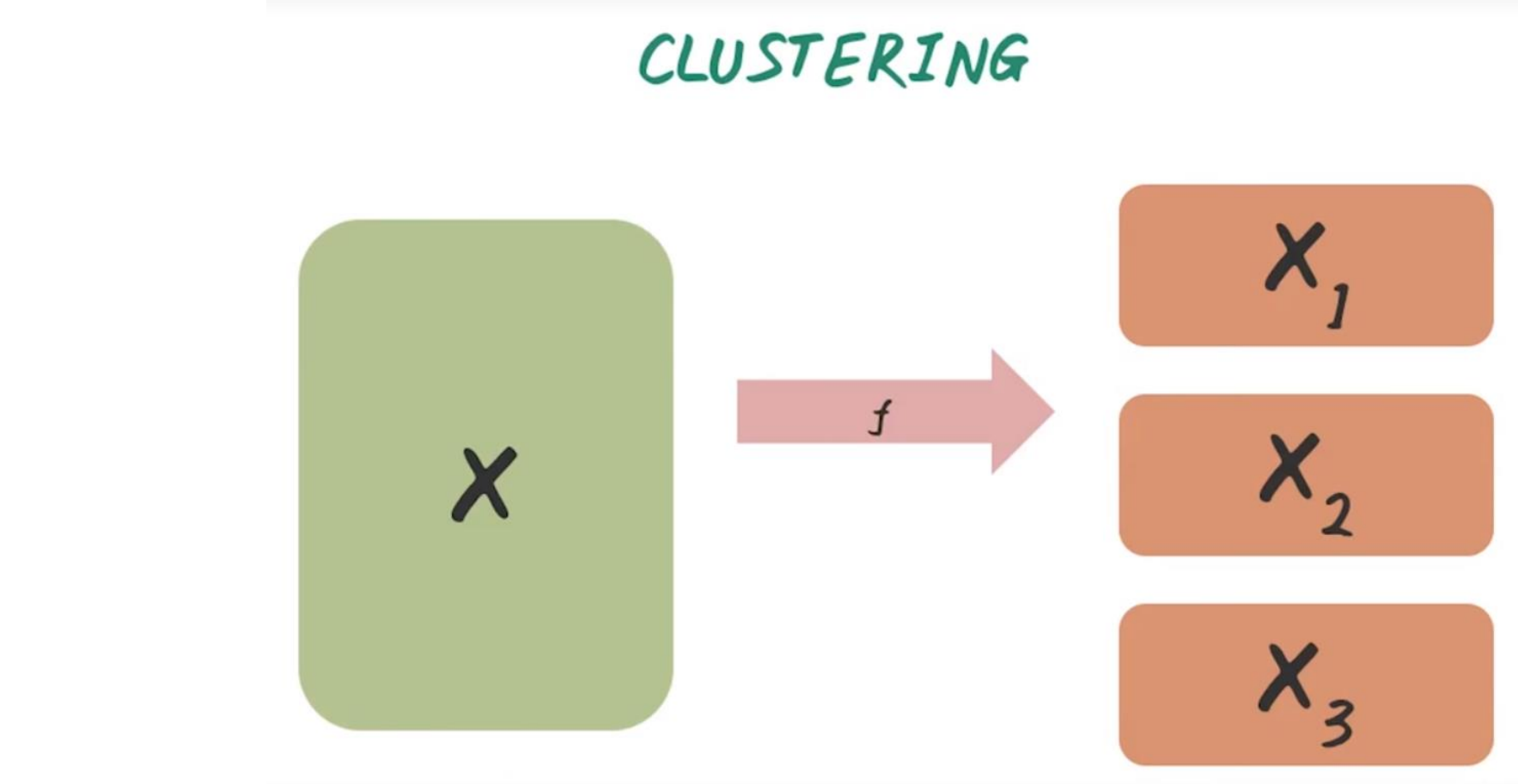

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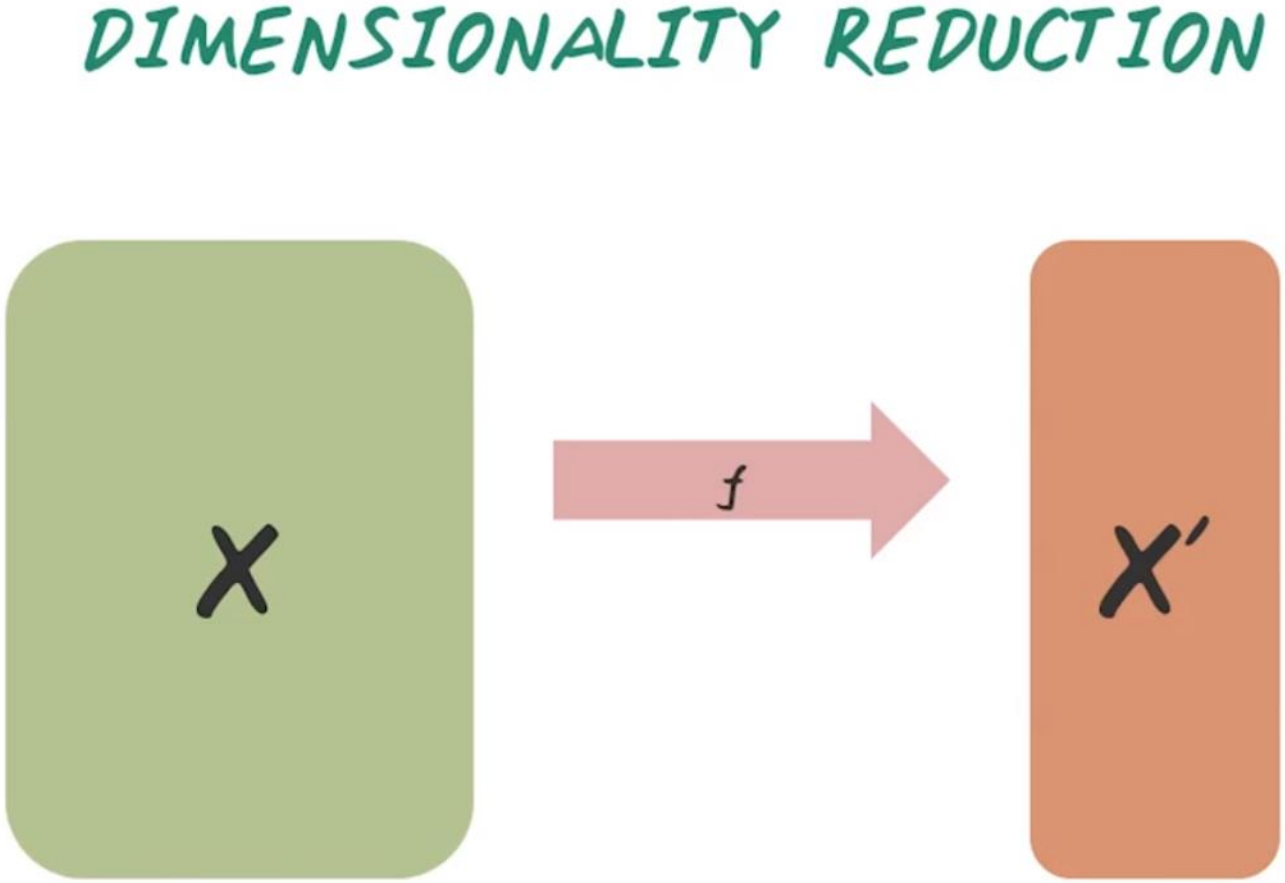

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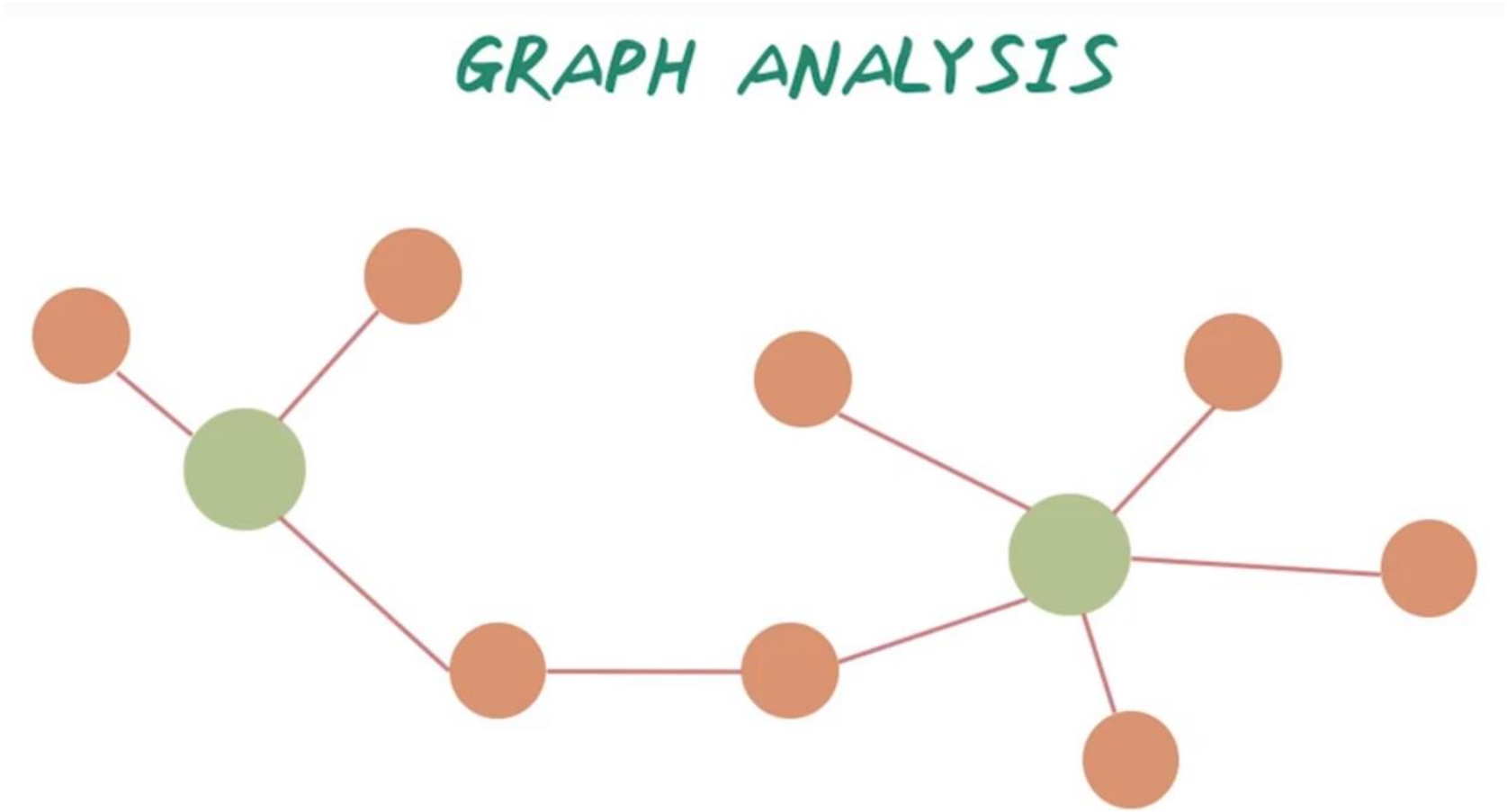

Lesson 2: Big Data Course Overview

BIG DATA SYSTEMS

Distributed disk-based big data system

Distributed in-memory big data system

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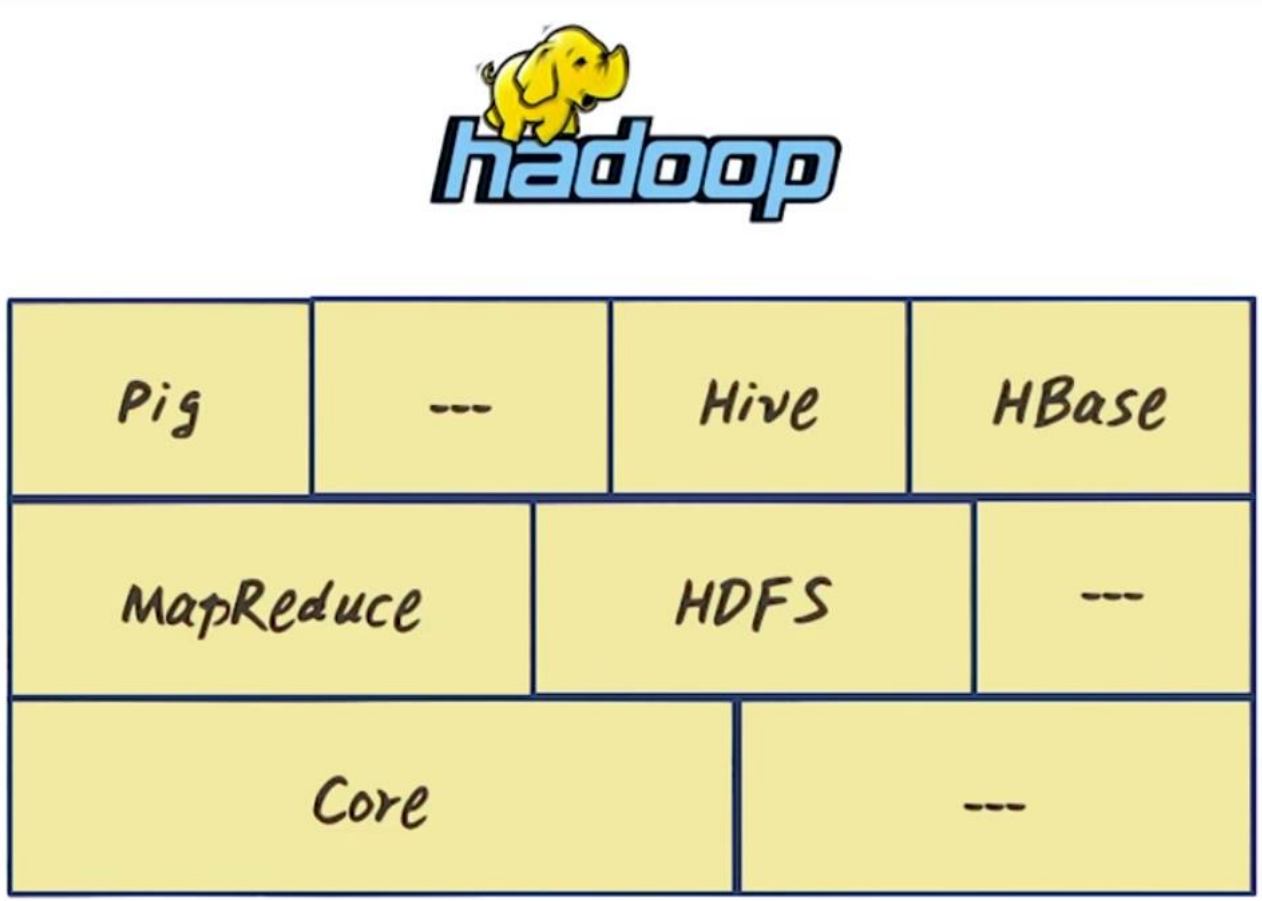
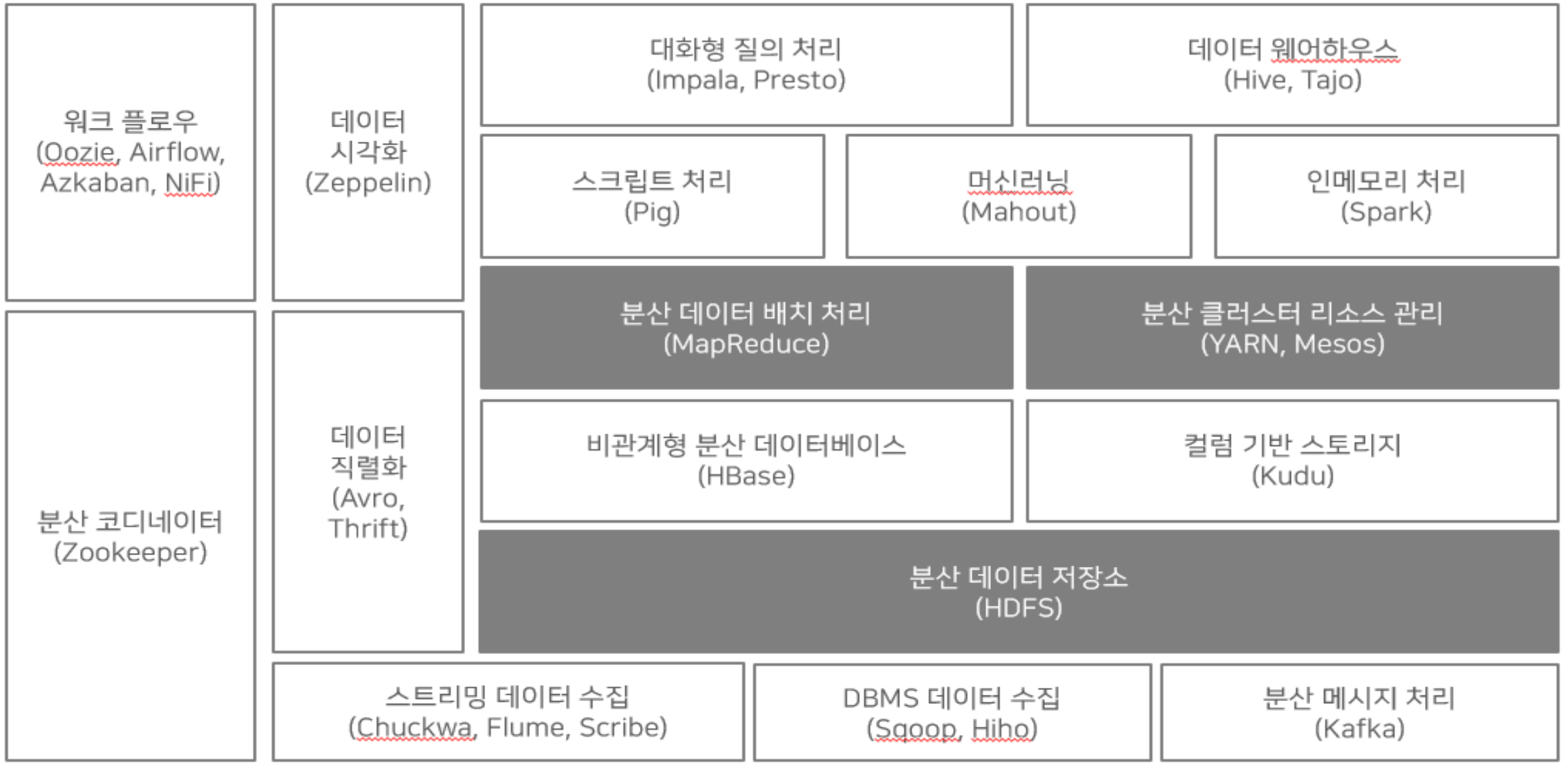


Hadoop 2.0과 Ecosystem



Hadoop Ecosystem

데이터 시각화: SAS Visual Analytics | Tableau | Qlik | SAP Lumina | R | D3.JS | iCHARTs | TimeLine JS | Apache Zeppelin

시스템 배포: Apache ambari | Cloudera Manager | Apache Mesos | Marathon | Apache Bigtop | Apache Eagle | Buildoop | Brooklyn | Apache Helix

데이터 수집

- Apache Flume
- Apache Sqoop
- Facebook Scribe
- Apache Kafa
- Netflix Suro
- Apache Samza
- Cloudera Morphline
- Apache NiFi
- HIHO

서비스프로그래밍

- Apache Thrift
- Apache Karaf
- Apache Zookeeper
- Elephant Bird
- Apache Avro
- Norbert

스케줄링/복제

- Apache Oozie
- Linkedin Azkaban
- Apache Falcon

보안

- Apache Sentry
- Apache Ranger

프레임워크

- SpingXD
- Jumbune

메타데이터

- Metascope
- Apache Tika

머신러닝

- Apache Mahout
- WEKA
- Spark MLLIB
- Deeplearning4j
- MADLib
- H2O
- Sparkling Water
- Apache SystemML

분산 프로그램밍

Apache Pig	Apache Flink	Apache Twill	Kangaroo
Apache MapReduce	Apache Apex	Apache Hama	Apache Beam
Apache Spark	Facebook Corona	Apache Tez	JQAL
Apache Storm	Apache REEF	Apache DataFu	TinkerPop

SQL on Hadoop

Apache Hive	Facebook Presto
Cloudera Impala	Kylin
Apache HCatalog	Apache Tajo
Apache HAWQ	Apache Phoenix

NoSQL Databases

Wide Column	Document	Key-Value	Graph
Apache HBase	MongoDB	Redis	Giraph
Apache Cassandra	CouchDB	OpenTSDB	Neo4j
Apache Parquet	DunamoDB	RocksDB	TitanDB
Apache Kudu	Gemfire	Linkedin Voldemort	OrientDB

NewSQL Databases

TokuDB	InfluxDB
SAP HANA	Haeinsa
VoltDB	Drizzle

분산 파일 시스템: Apache HDFS | Red Hat GlusterFS | Lustre File System | GridGain | XtreemFS | Quantcast File System | Ceph File System | Brooklyn

Cloudera Enterprise

데이터 시각화: SAS Visual Analytics | Tableau | Qlik | SAP Lumina | R | D3.JS | iCHARTs | TimeLine JS | Apache Zeppelin

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NewSQL Databases
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