What is data engineering?

INTRODUCTION TO DATA ENGINEERING

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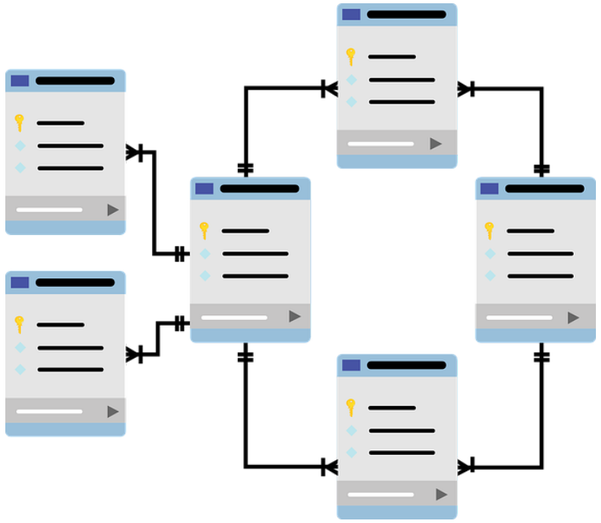
What to expect

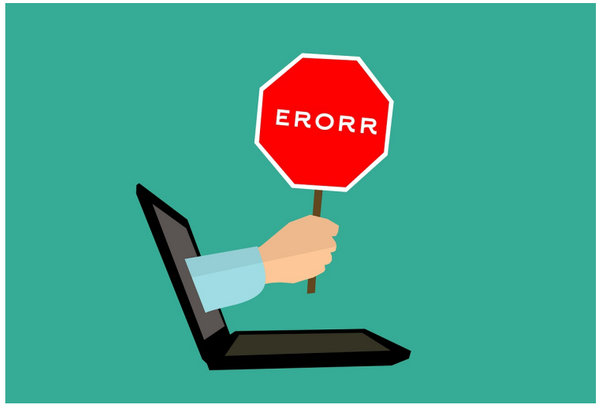
- Chapter 1
  - What is data engineering?
- Chapter 2
  - Tools data engineers use
- Chapter 3
  - Extract
  - Transform
  - Load
- Chapter 4
  - Data engineering at DataCamp!

In comes the data engineer

- Data is scattered
- Not optimized for analyses
- Legacy code is causing corrupt data



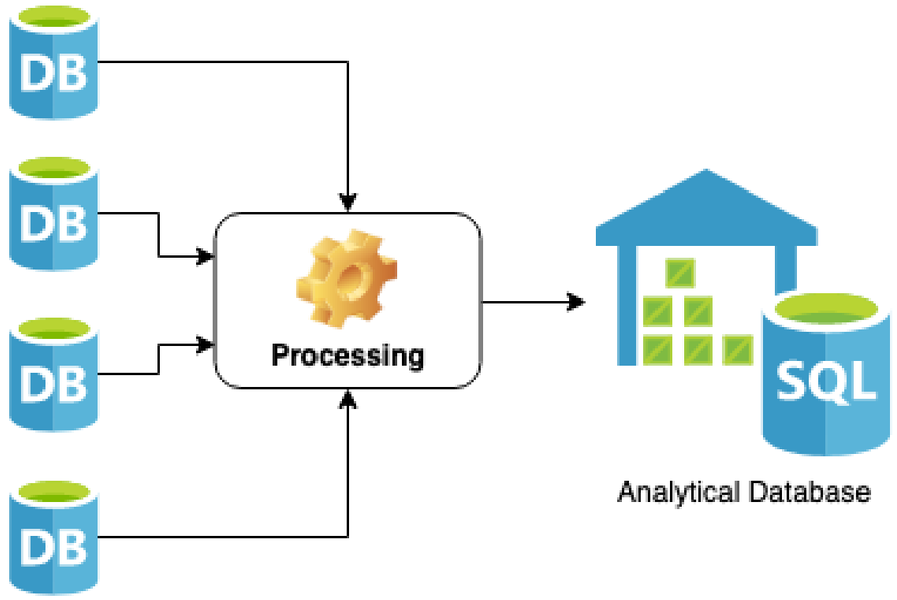
Data engineer to the rescue!



Data engineers: making your life easier

- Gather data from different sources
- Optimized database for analyses
- Removed corrupt data

Data scientist's life got way easier!



Definition of the job

> An engineer that develops, constructs, tests, and maintains architectures such as databases and large-scale processing systems

- Processing large amounts of data
- Use of clusters of machines

Data Engineer vs Data Scientist

Data Engineer

- Develop scalable data architecture
- Streamline data acquisition
- Set up processes to bring together data
- Clean corrupt data
- Well versed in cloud technology

Data Scientist

- Mining data for patterns
- Statistical modeling
- Predictive models using machine learning
- Monitor business processes
- Clean outliers in data

Let's practice!

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Tools of the data engineer

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Databases

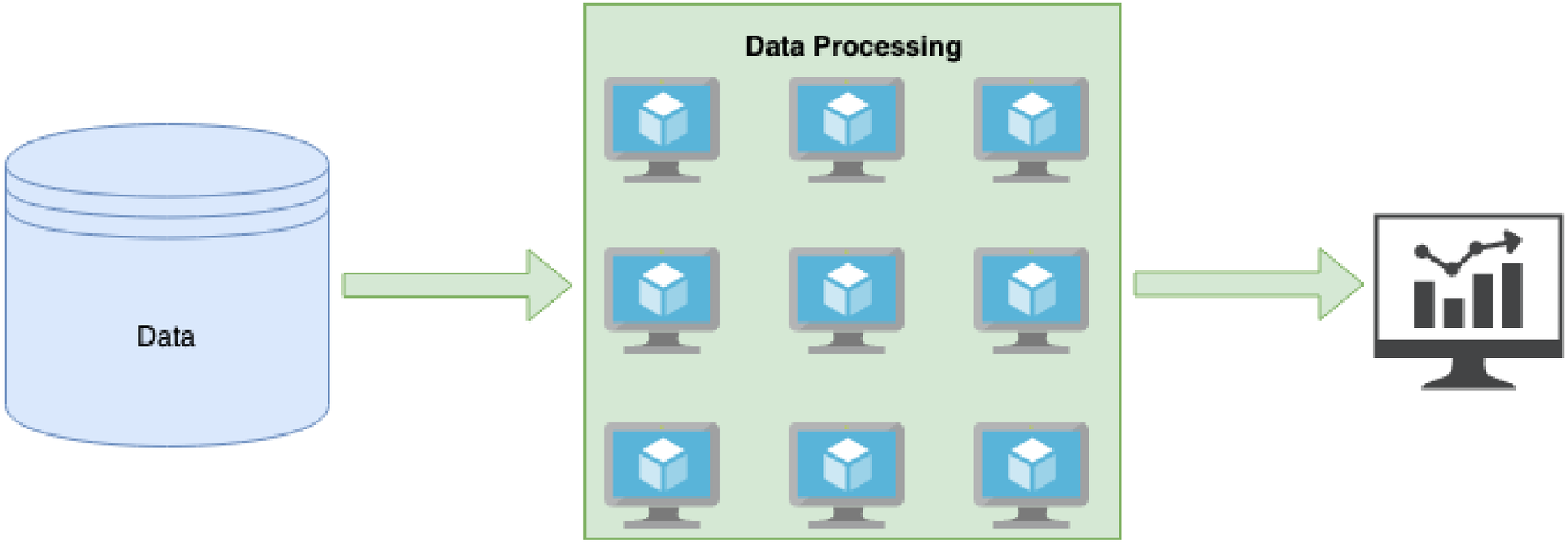
- Hold large amounts of data
- Support application

- Other databases are used for analyses

Product
name
price
stock_amount

Processing

- Clean data
- Aggregate data
- Join data



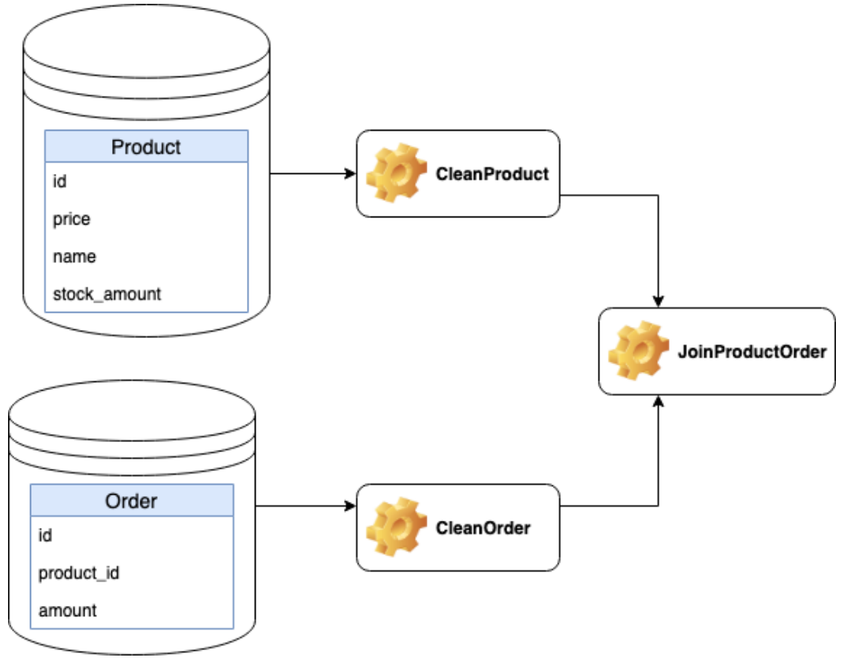
Processing: an example

```
df = spark.read.parquet("users.parquet")

outliers = df.filter(df["age"] > 100)

print(outliers.count())
```

Data engineer understands the abstractions.

Scheduling

- Plan jobs with specific intervals
- Resolve dependency requirements of jobs



`JoinProductOrder` needs to run after `CleanProduct` and `CleanOrder`

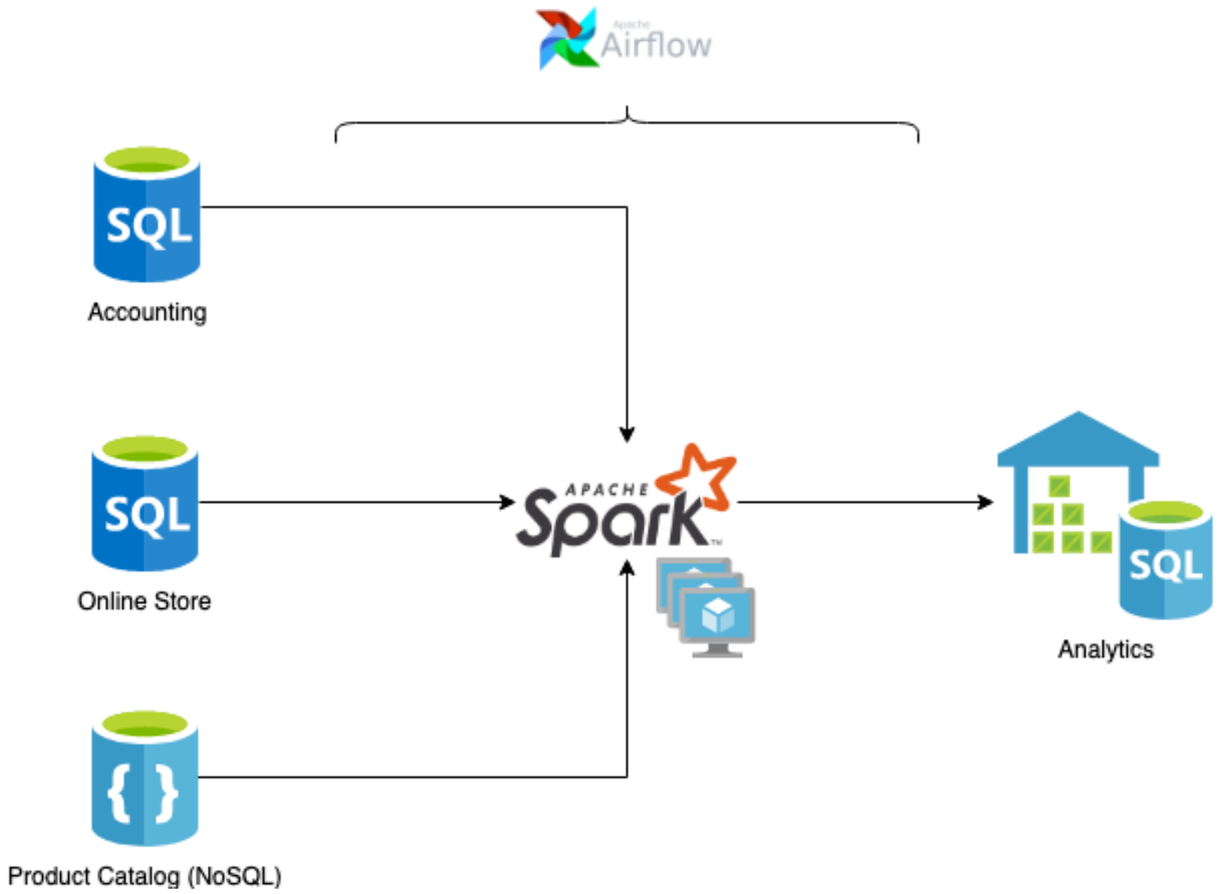
Existing tools

Databases

Processing

Scheduling

A data pipeline



Let's practice!

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Cloud providers

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Data processing in the cloud

Clusters of machines required

Problem: self-host data-center

- Cover electrical and maintenance costs
- Peaks vs. quiet moments: hard to optimize

Solution: use the cloud

Data storage in the cloud

Reliability is required

Problem: self-host data-center

- Disaster will strike
- Need different geographical locations

Solution: use the cloud

The big three: AWS, Azure and Google

32% market share in 2018

17% market share in 2018

10% market share in 2018

- Storage
- Computation
- Databases.

Storage

Upload files, e.g. storing product images

Services

- AWS S3
- Azure Blob Storage
- Google Cloud Storage

Computation

Perform calculations, e.g. hosting a web server

Services

- AWS EC2
- Azure Virtual Machines
- Google Compute Engine

Databases

Hold structured information

Services

- AWS RDS
- Azure SQL Database
- Google Cloud SQL

Let's practice!

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