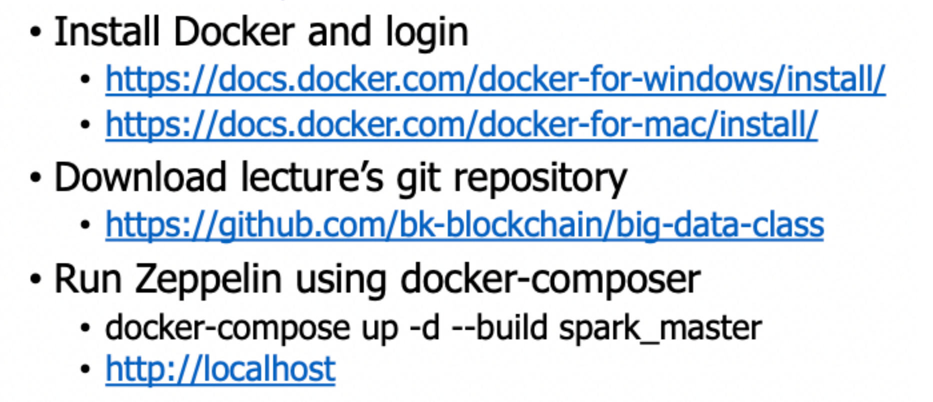
Spark Load Inspect

Zeppelin notebook

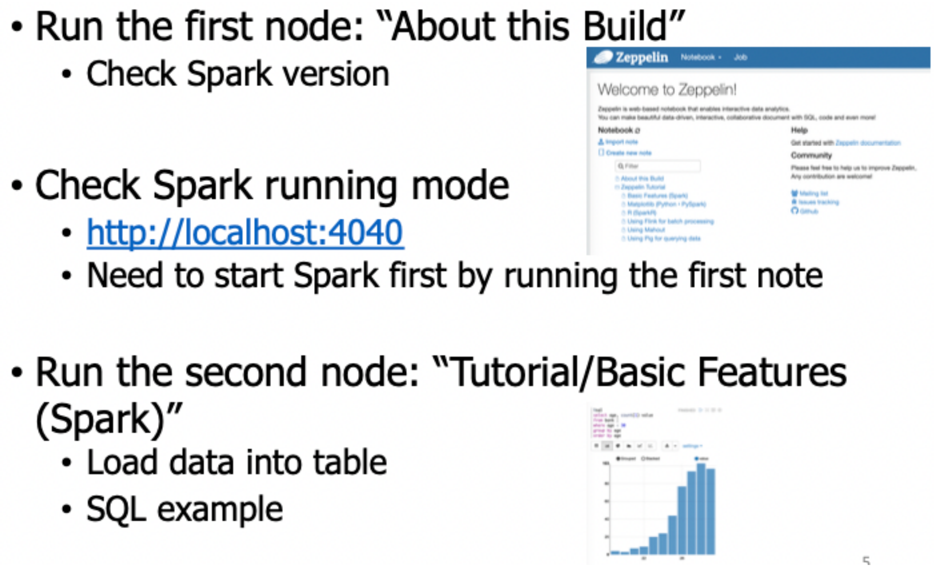
- A web-based interface for interactive data analytics.
    - Easy to write and access your code.
    - Support many programming languages.
        - Scala (with Apache Spark), Python (with Apache Spark), SparkSQL, Hive, Markdown, Angular, and Shell.
    - Data visualization.
- Monitoring Spark jobs.

Installation Using Docker



- Install Docker and login
    - https://docs.docker.com/docker-for-windows/install/
    - https://docs.docker.com/docker-for-mac/install/
- Download lecture's git repository
    - https://github.com/bk-blockchain/big-data-class
- Run Zeppelin using docker-composer
    - docker-compose up -d --build spark_master
    - http://localhost

Zeppelin usage



- Run the first node: "About this Build"
    - Check Spark version
- Check Spark running mode
    - http://localhost:4040
    - Need to start Spark first by running the first note
- Run the second node: "Tutorial/Basic Features (Spark)"
    - Load data into table
    - SQL example

Welcome to Zeppelin!

Zeppelin is web-based notebook that enables interactive data analytics.
You can make beautiful data-driven, interactive, collaborative document with SQL, code and even more!

Notebook

- Import note
- Create new note
- Filter
    - About this Build
    - Zeppelin Tutorial
        - Basic Features (Spark)
        - Matplotlib (Python • PySpark)
        - R (SparkR)
        - Using Flink for batch processing
        - Using Mahout
        - Using Pig for querying data

Help

Get started with Zeppelin documentation

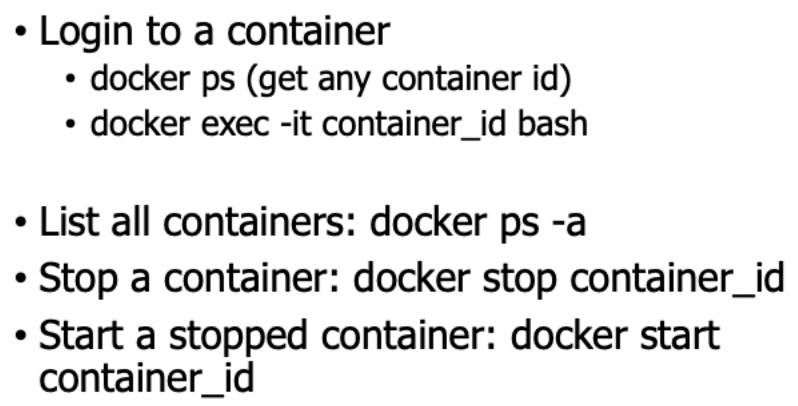
Community

Please feel free to help us to improve Zeppelin.
Any contribution are welcome!

- Mailing list
- Issues tracking
- Github

```
%sql
select age, count(1) value
from bank
where age < 30
group by age
order by age
```

Useful Docker Commands



- Login to a container
  - docker ps (get any container id)
  - docker exec -it container_id bash

- List all containers: docker ps -a
- Stop a container: docker stop container_id
- Start a stopped container: docker start container_id

Load, Inspect, and Save Data

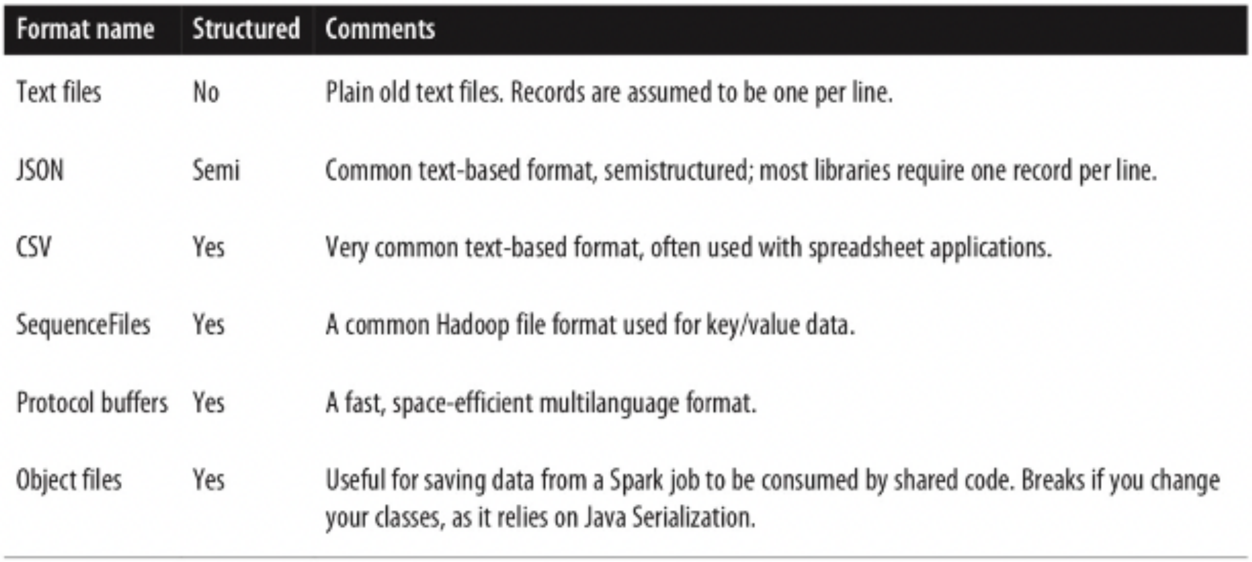
- Data is always huge that does not fit on a single machine.
  - Data is distributed on many storage nodes.
- Data scientists can likely focus on the format that their data is already in.
  - Engineers may wish to explore more output formats.
- Spark supports a wide range of input and output sources.

Data sources

- File formats and file systems.
  - Local or distributed filesystem, such as NFS, HDFS, or Amazon S3.
  - File formats including text, JSON, SequenceFiles, and protocol buffers.
- Structured data sources through Spark SQL:
  - Apache Hive.
  - Parquet.
  - JSON.
  - From RDDs.
- Databases and key/value stores.
  - Cassandra, HBase, Elasticsearch, and JDBC dbs.

File Formats

- Formats range from unstructured, like text to semi-structured, like JSON, to structured, like SequenceFiles.



Format name	Structured	Comments
Text files	No	Plain old text files. Records are assumed to be one per line.
JSON	Semi	Common text-based format, semistructured; most libraries require one record per line.
CSV	Yes	Very common text-based format, often used with spreadsheet applications.
SequenceFiles	Yes	A common Hadoop file format used for key/value data.
Protocol buffers	Yes	A fast, space-efficient multilanguage format.
Object files	Yes	Useful for saving data from a Spark job to be consumed by shared code. Breaks if you change your classes, as it relies on Java Serialization.

From Learning Spark [1]