Apache Zeppelin

A Notebook Interface to our Big Data

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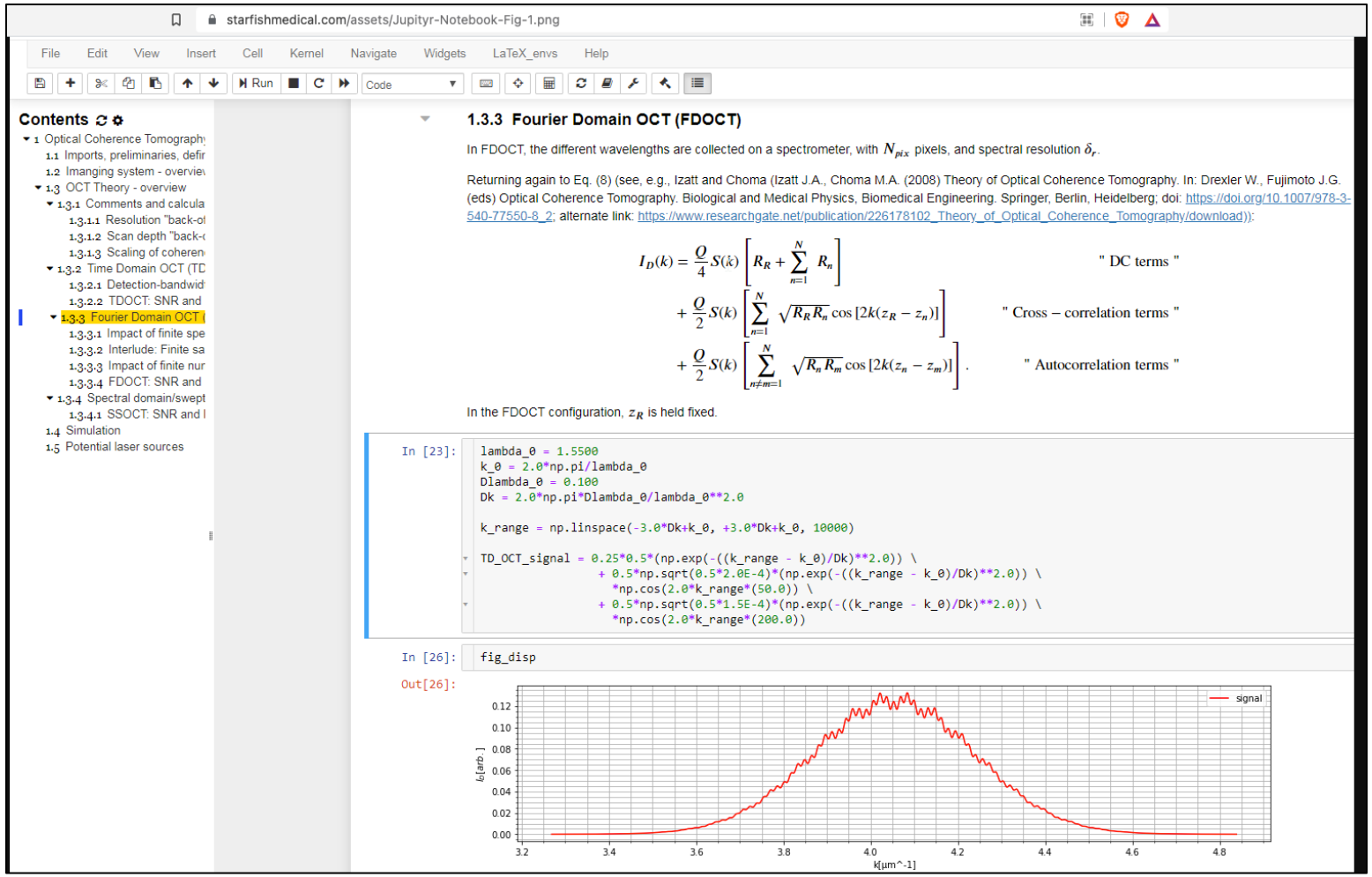
Apache Zeppelin

- primarily used as a quick way to experiment with Apache Spark script
- visualize our big data in an interactive manner
- has plug-ins for other components in Hadoop cluster, like HBase, Cassandra…
- a tool for doing data science on HDFS cluster

What is Zeppelin

- It's a *notebook*
- Let us interactively run scripts / code against the data
- interleave with nicely formatted notes
- Share notebooks with others on the cluster
- Speed up development cycle
- Just like Jupyter Notebook (Python) or R Notebook (R)

Example of Jupyter Notebook



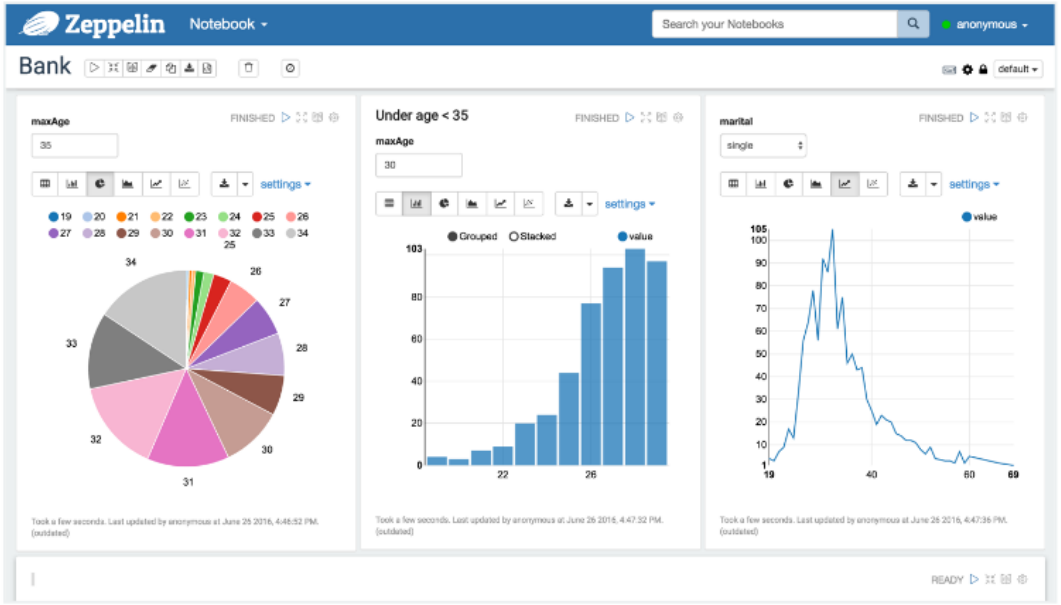
https://bit.ly/3ugdAV0

Zeppelin notebook

Multi-purpose Notebook

The Notebook is the place for all your needs

- Data Ingestion
- Data Discovery
- Data Analytics
- Data Visualization & Collaboration



https://bit.ly/3bHbWoY

Apache Spark integration

- Can run Spark code interactively

  -allows easy experimentation and exploration of the big data
- Can execute SQL queries directly against SparkSQL
- Query results may be visualized in charts and graphs
- Make Spark feel more like a data science tool!

instead of writing Spark script in puTTY and run using spark-submit wondering what the output would be

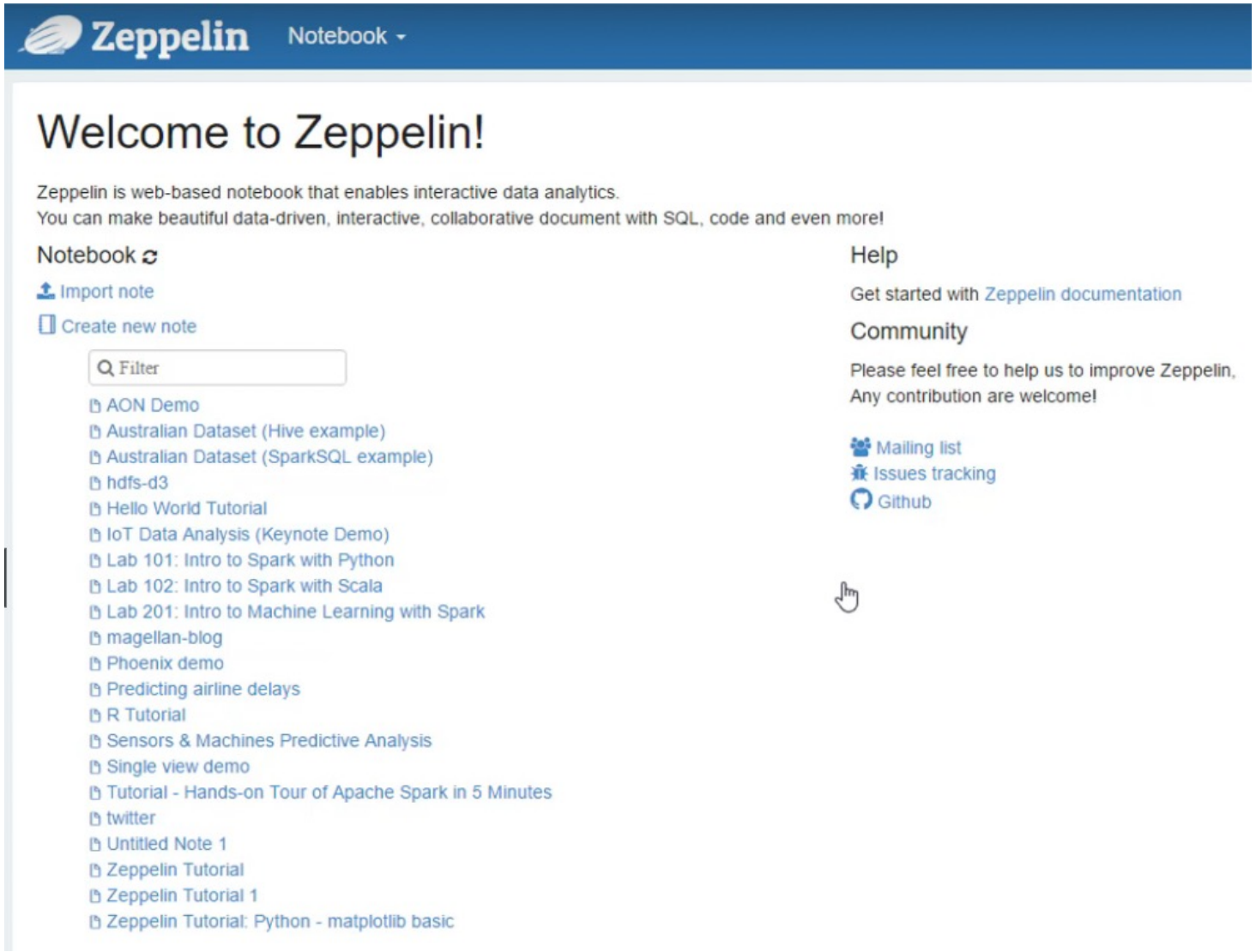
Multiple Language Backend

Apache Zeppelin interpreter concept allows any language/data-processing-backend to be plugged into Zeppelin. Currently Apache Zeppelin supports many interpreters such as Apache Spark, Apache Flink, Python, R, JDBC, Markdown and Shell.

https://bit.ly/3bHbWoY

To connect Zeppelin

- Open a browser window, connect to the following port number
  - ***127.0.0.1:9995***
- Click ***"Create new note"*** button to start writing a notebook



Hands on: Playing with Movielens using Zeppelin

- First, need to prioritize the backend interpreters
- click the ***gear button*** on top right →***interpreter binding***
- drag ***spark*** to the top (if it is not), and ***md*** second

```
%md
### Let's make sure Spark is working first!
Let's see what version we're working with.
```

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Let's see what version we're working with.

```
sc.version
```

Execute shell command in Zeppelin

```
%sh

wget http://media.sundog-soft.com/hadoop/ml-100k/u.data -O /tmp/u.data
wget http://media.sundog-soft.com/hadoop/ml-100k/u.item -O /tmp/u.item
echo "Downloaded!"
```

Copy data to HDFS

```
%sh

hadoop fs -rm -r -f /tmp/ml-100k

hadoop fs -mkdir /tmp/ml-100k

hadoop fs -put /tmp/u.data /tmp/ml-100k/
hadoop fs -put /tmp/u.item /tmp/ml-100k/
```

Write Scala code (primary interpreter for Spark!!!)

- Extract 2nd and 3rd field from u.data

```
final case class Rating(movieID: Int, rating: Int)

val lines = sc.textFile("hdfs:///tmp/ml-100k/u.data").map(x => {val fields = x.split("\t"); Rating(fields(1).toInt, fields(2).toInt)})
```

- Create Spark DataFrame

```
import sqlContext.implicits._
val ratingsDF = lines.toDF()

ratingsDF.printSchema()
```

Write Scala code *[continued...]*

- Get top movieIDs

```
val topMovieIDs = ratingsDF.groupBy("movieID").count().orderBy(desc("count")).cache()
topMovieIDs.show()
```

Write SQL query

- Create a table [convert from dataframe to a table]

```
ratingsDF.registerTempTable("ratings")
```

- Run SQL command

```
%sql

SELECT * FROM ratings LIMIT 10
```

```
%sql
SELECT rating, COUNT(*) as count FROM ratings GROUP BY rating
```

Get movie title name

```
final case class Movie(movieID: Int, title: String)

val lines = sc.textFile("hdfs:///tmp/ml-100k/u.item").map(x => {val fields = x.split('|'); Movie(fields(0).toInt, fields(1))})

import sqlContext.implicits._
val moviesDF = lines.toDF()

moviesDF.show()
```

```
moviesDF.registerTempTable("titles")
```

```
%sql

SELECT t.title, count(*) cnt FROM ratings r JOIN titles t ON r.movieID = t.movieID GROUP BY t.title ORDER BY cnt DESC LIMIT 20
```

Remember to share your Zeppelin notebook with Others!!!

Hue – *H*adoop *U*ser *E*xperience ☺

- A close competitor of Hortonworks Data Platform [HDP]
- access Hue here: gethue.com

☺Thanks for tagging along on this journey for the past one year ☺

Good Luck !!!

&

until we meet again, take care!!!

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