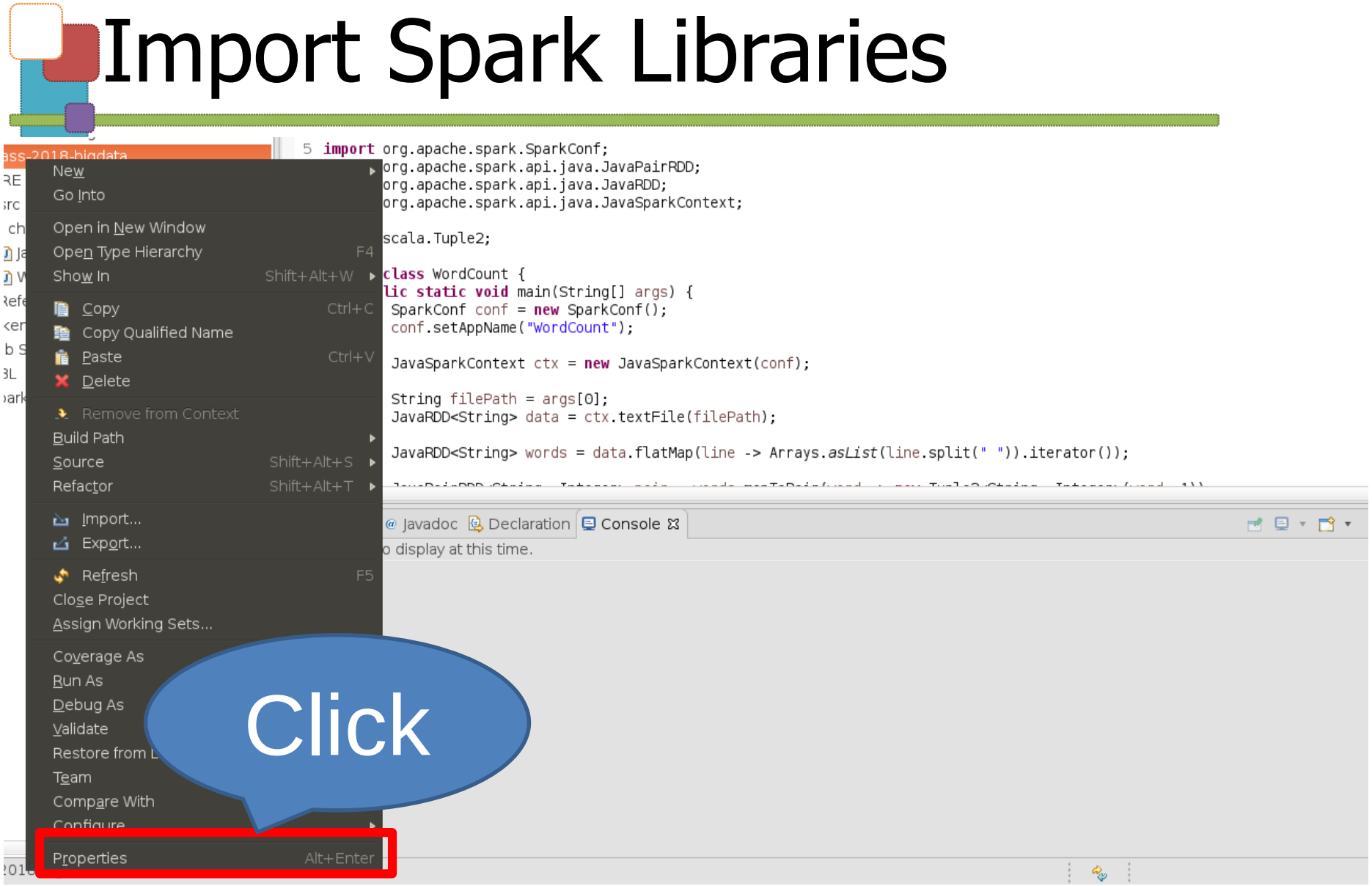
WordCount using Spark in Java

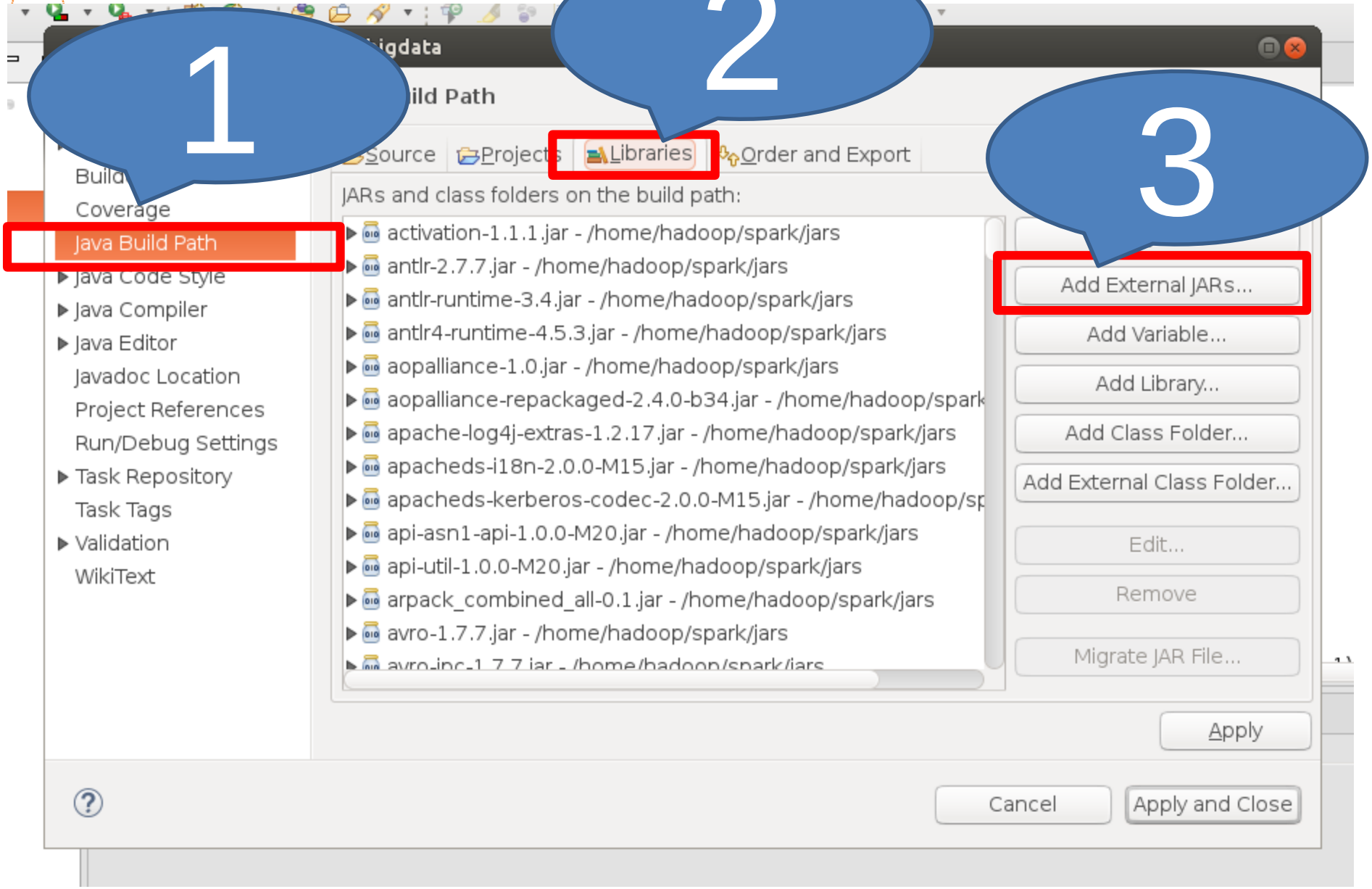
Step-by-Step

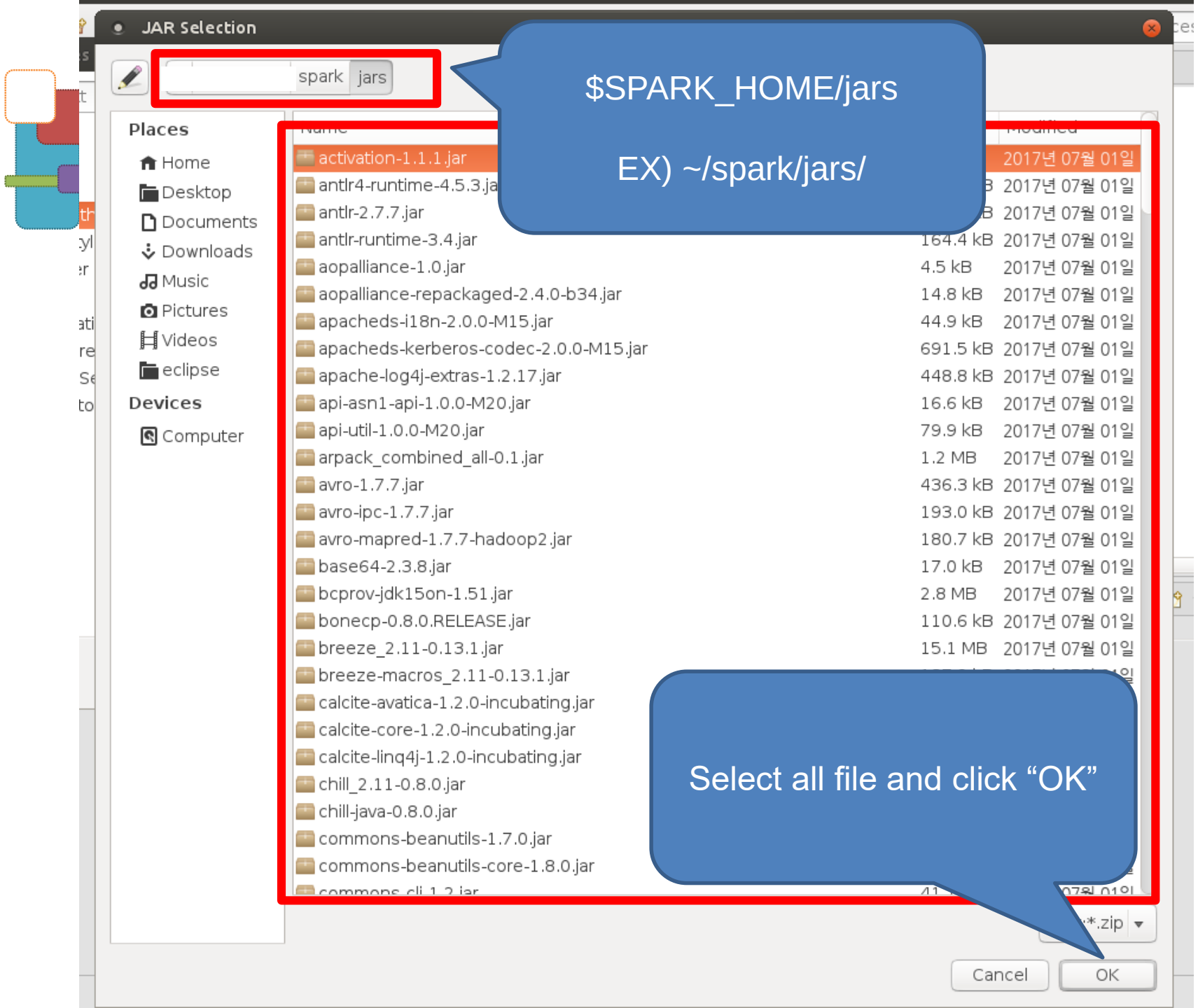
BigDataMiningLab.

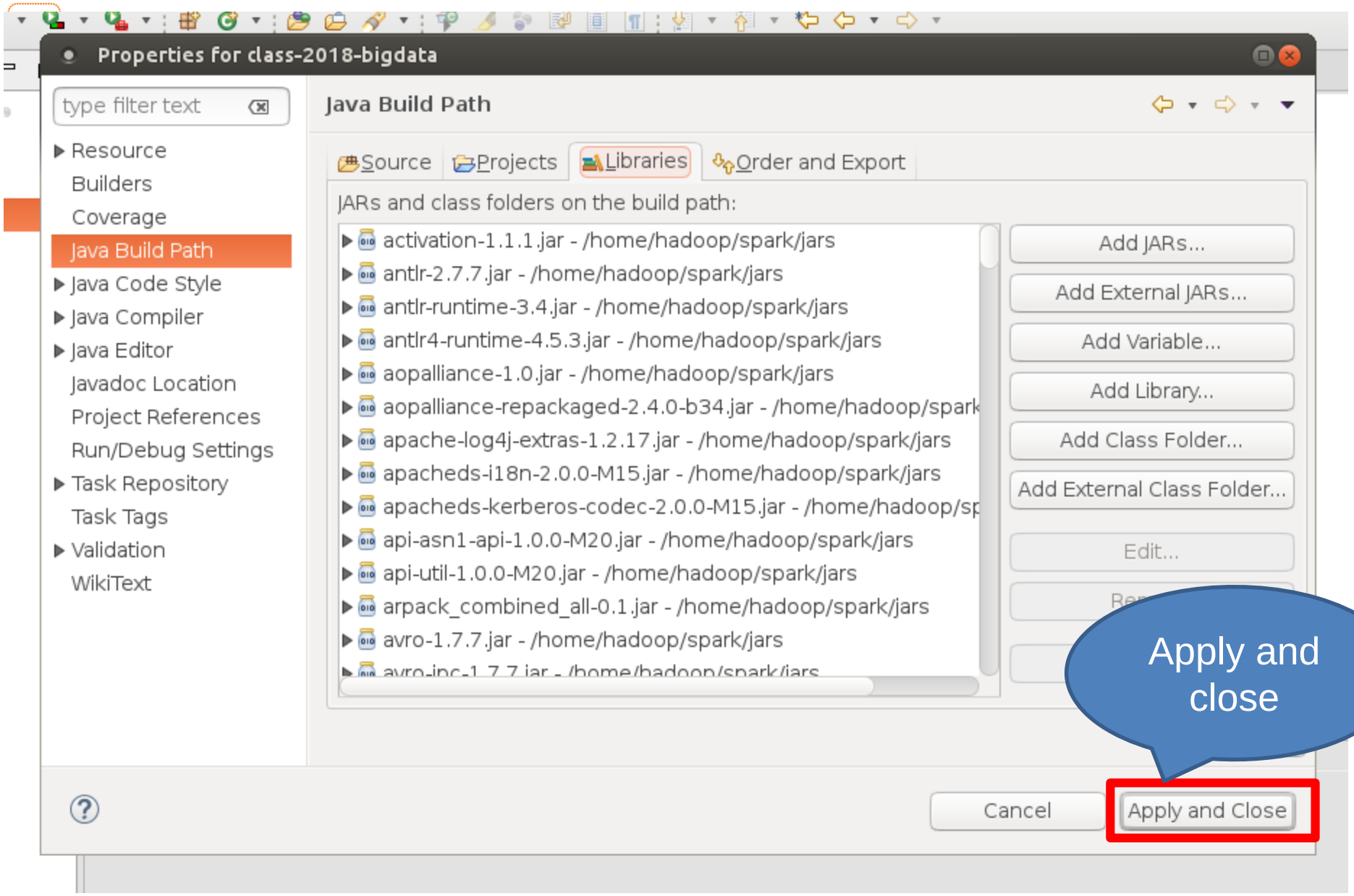
Import Spark Libraries into Project

Import Spark Libraries




1
2
3
igdata
ild Path
Source
Projects
Libraries
Order and Export
Build
Coverage
Java Build Path
Java Code Style
Java Compiler
Java Editor
Javadoc Location
Project References
Run/Debug Settings
Task Repository
Task Tags
Validation
WikiText
JARs and class folders on the build path:
activation-1.1.1.jar - /home/hadoop/spark/jars
antlr-2.7.7.jar - /home/hadoop/spark/jars
antlr-runtime-3.4.jar - /home/hadoop/spark/jars
antlr4-runtime-4.5.3.jar - /home/hadoop/spark/jars
aopalliance-1.0.jar - /home/hadoop/spark/jars
aopalliance-repackaged-2.4.0-b34.jar - /home/hadoop/spark
apache-log4j-extras-1.2.17.jar - /home/hadoop/spark/jars
apacheds-i18n-2.0.0-M15.jar - /home/hadoop/spark/jars
apacheds-kerberos-codec-2.0.0-M15.jar - /home/hadoop/sp
api-asn1-api-1.0.0-M20.jar - /home/hadoop/spark/jars
api-util-1.0.0-M20.jar - /home/hadoop/spark/jars
arpack_combined_all-0.1.jar - /home/hadoop/spark/jars
avro-1.7.7.jar - /home/hadoop/spark/jars
Add External JARs...
Add Variable...
Add Library...
Add Class Folder...
Add External Class Folder...
Edit...
Remove
Migrate JAR File...
Apply
Cancel
Apply and Close


JAR Selection
spark
jars
$SPARK_HOME/jars
EX) ~/spark/jars/
Places
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
eclipse
Devices
Computer
activation-1.1.1.jar 2017년 07월 01일
antlr4-runtime-4.5.3.ja 2017년 07월 01일
antlr-2.7.7.jar 2017년 07월 01일
antlr-runtime-3.4.jar 164.4 kB 2017년 07월 01일
aopalliance-1.0.jar 4.5 kB 2017년 07월 01일
aopalliance-repackaged-2.4.0-b34.jar 14.8 kB 2017년 07월 01일
apacheds-i18n-2.0.0-M15.jar 44.9 kB 2017년 07월 01일
apacheds-kerberos-codec-2.0.0-M15.jar 691.5 kB 2017년 07월 01일
apache-log4j-extras-1.2.17.jar 448.8 kB 2017년 07월 01일
api-asn1-api-1.0.0-M20.jar 16.6 kB 2017년 07월 01일
api-util-1.0.0-M20.jar 79.9 kB 2017년 07월 01일
arpack_combined_all-0.1.jar 1.2 MB 2017년 07월 01일
avro-1.7.7.jar 436.3 kB 2017년 07월 01일
avro-ipc-1.7.7.jar 193.0 kB 2017년 07월 01일
avro-mapred-1.7.7-hadoop2.jar 180.7 kB 2017년 07월 01일
base64-2.3.8.jar 17.0 kB 2017년 07월 01일
bcprov-jdk15on-1.51.jar 2.8 MB 2017년 07월 01일
bonecp-0.8.0.RELEASE.jar 110.6 kB 2017년 07월 01일
breeze_2.11-0.13.1.jar 15.1 MB 2017년 07월 01일
breeze-macros_2.11-0.13.1.jar
calcite-avatica-1.2.0-incubating.jar
calcite-core-1.2.0-incubating.jar
calcite-linq4j-1.2.0-incubating.jar
chill_2.11-0.8.0.jar
chill-java-0.8.0.jar
commons-beanutils-1.7.0.jar
commons-beanutils-core-1.8.0.jar
Select all file and click “OK”
*.zip
Cancel
OK


Properties for class-2018-bigdata
type filter text
Resource
Builders
Coverage
Java Build Path
Java Code Style
Java Compiler
Java Editor
Javadoc Location
Project References
Run/Debug Settings
Task Repository
Task Tags
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Order and Export
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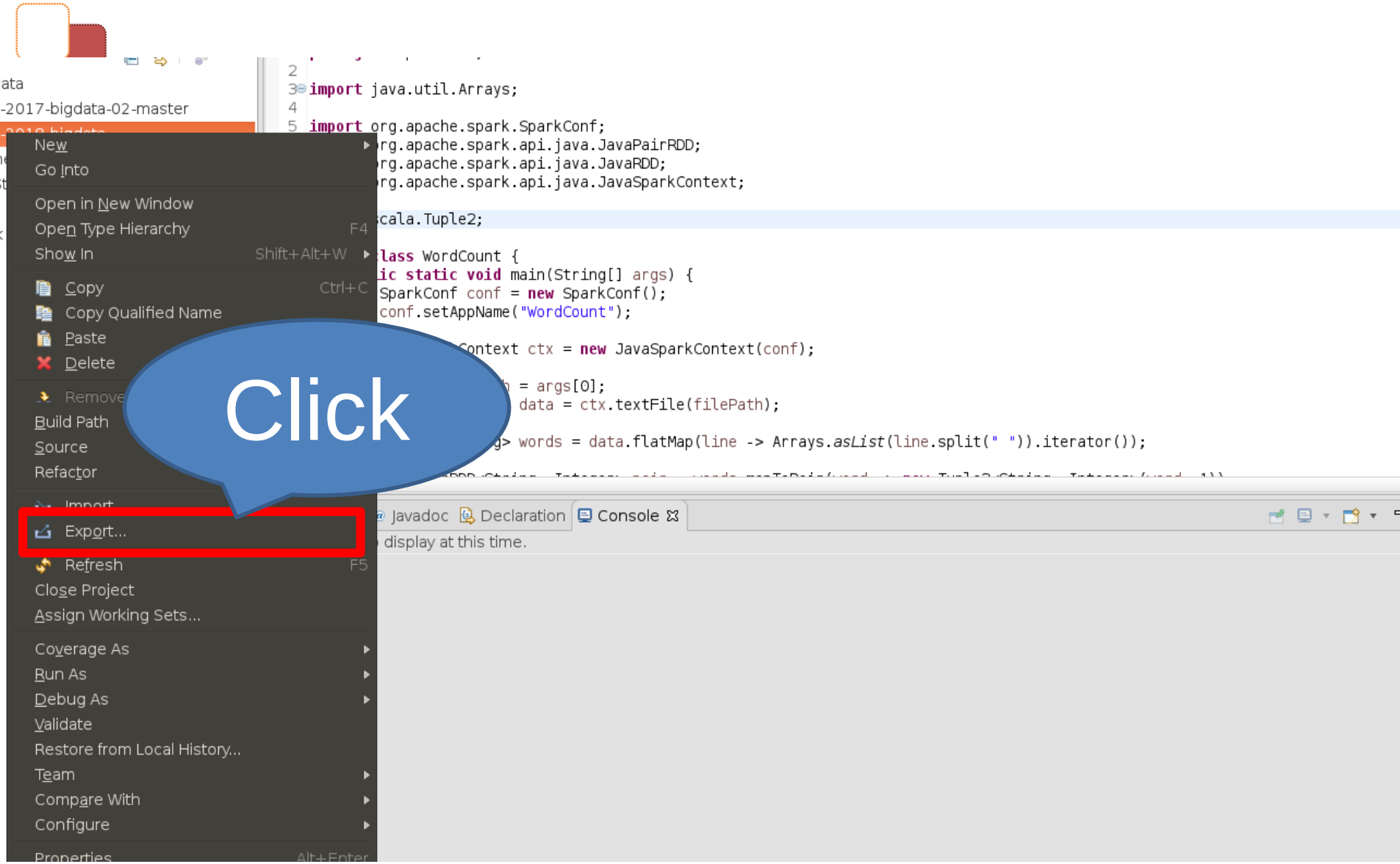
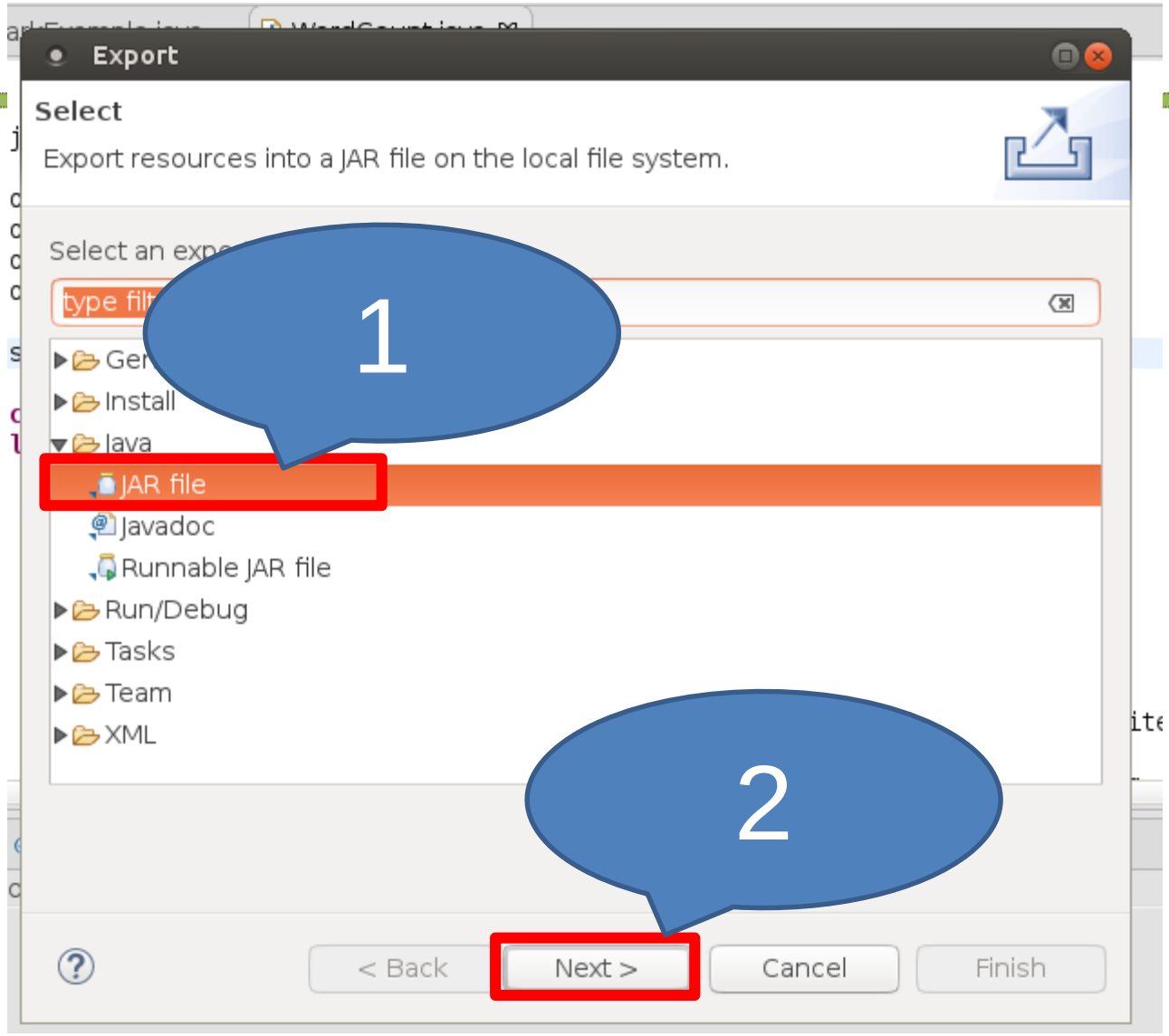
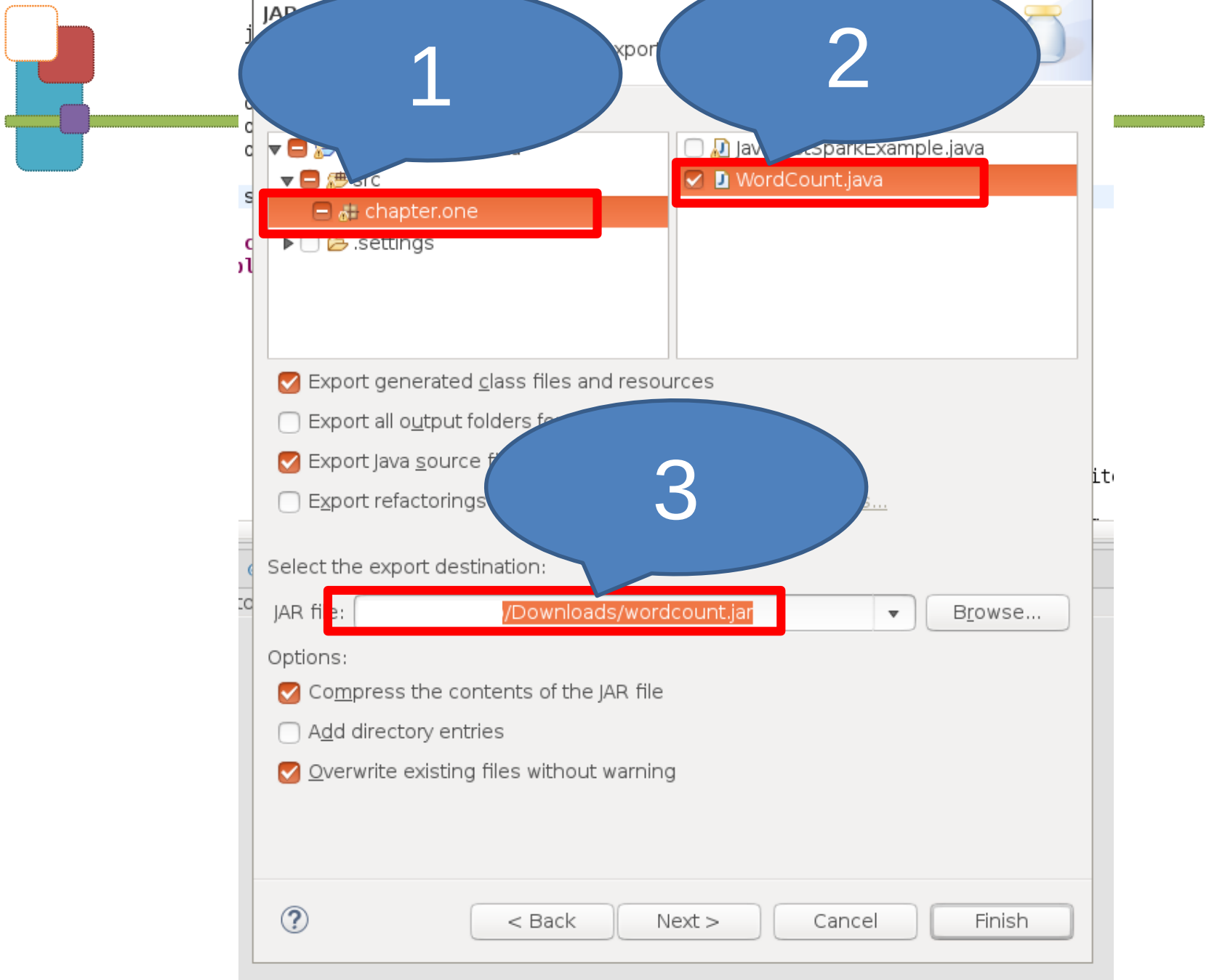
antlr4-runtime-4.5.3.jar - /home/hadoop/spark/jars
aopalliance-1.0.jar - /home/hadoop/spark/jars
aopalliance-repackaged-2.4.0-b34.jar - /home/hadoop/spark
apache-log4j-extras-1.2.17.jar - /home/hadoop/spark/jars
apacheds-i18n-2.0.0-M15.jar - /home/hadoop/spark/jars
apacheds-kerberos-codec-2.0.0-M15.jar - /home/hadoop/sp
api-asn1-api-1.0.0-M20.jar - /home/hadoop/spark/jars
api-util-1.0.0-M20.jar - /home/hadoop/spark/jars
arpack_combined_all-0.1.jar - /home/hadoop/spark/jars
avro-1.7.7.jar - /home/hadoop/spark/jars
Add JARs...
Add External JARs...
Add Variable...
Add Library...
Add Class Folder...
Add External Class Folder...
Edit...
Apply and close
Cancel
Apply and Close

Export “jar”

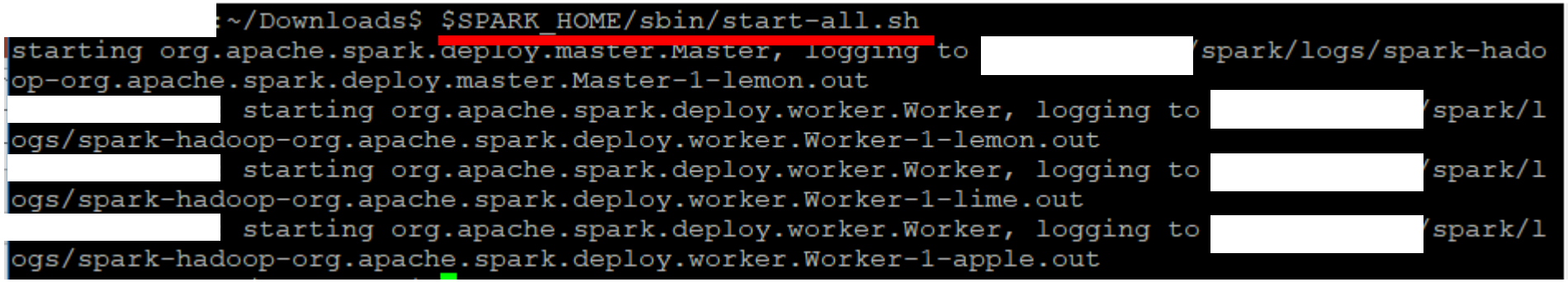

-data
ss-2017-bigdata-02-master
New
Go Into
Open in New Window
Open Type Hierarchy F4
Show In Shift+Alt+W
Copy Ctrl+C
Copy Qualified Name
Paste
Delete
Remove
Build Path
Source
Refactor
Import
Export...
Refresh F5
Close Project
Assign Working Sets...
Coverage As
Run As
Debug As
Validate
Restore from Local History...
Team
Compare With
Configure
Properties Alt+Enter
Click
import java.util.Arrays;
import org.apache.spark.SparkConf;
rg.apache.spark.api.java.JavaPairRDD;
rg.apache.spark.api.java.JavaRDD;
rg.apache.spark.api.java.JavaSparkContext;
cala.Tuple2;
lass WordCount {
ic static void main(String[] args) {
SparkConf conf = new SparkConf();
conf.setAppName("WordCount");
ontext ctx = new JavaSparkContext(conf);
= args[0];
data = ctx.textFile(filePath);
g> words = data.flatMap(line -> Arrays.asList(line.split(" ")).iterator());
Javadoc Declaration Console
display at this time.


Export
Select
Export resources into a JAR file on the local file system.
Select an exp
type filt
Ge
Install
Java
JAR file
Javadoc
Runnable JAR file
Run/Debug
Tasks
Team
XML
1
2
< Back
Next >
Cancel
Finish


JAR Export
1
2
3
chapter.one
.settings
WordCount.java
Export generated class files and resources
Export all output folders
Export Java source
Export refactorings
Select the export destination:
JAR file:
/Downloads/wordcount.jar
Browse...
Options:
Compress the contents of the JAR file
Add directory entries
Overwrite existing files without warning
< Back
Next >
Cancel
Finish

Run WordCount

$SPARK_HOME/sbin/start-all.sh



Spark UI

Spark Master at spark:// localhost:7077

URL: spark://
REST URL: spark: *(cluster mode)*
Alive Workers: 4
Cores in use: 32 Total, 0 Used
Memory in use: 58.4 GB Total, 0.0 B Used
Applications: 0 Running, 0 Completed
Drivers: 0 Running, 0 Completed
Status: ALIVE

Check where is spark running

Workers

Worker Id	Address	State	Cores	Memory
worker-20180906015228-		ALIVE	8 (0 Used)	22.5 GB (0.0 B Used)
worker-20180927161023-		ALIVE	8 (0 Used)	6.7 GB (0.0 B Used)
worker-20180927161156-		ALIVE	8 (0 Used)	6.7 GB (0.0 B Used)
worker-20180927161156-		ALIVE	8 (0 Used)	22.5 GB (0.0 B Used)

Running Applications

Application ID	Name	Cores	Memory per Executor	Submitted Time	User	State	Duration

Completed Applications

Application ID	Name	Cores	Memory per Executor	Submitted Time	User	State	Duration

Package name
For default package, it should be empty.
Ex) chapter.one.WordCount -> WordCount

Class name

```
$SPARK_HOME/bin/spark-submit --class chapter.one.WordCount --master spark://localhost:7077 wordcount.jar $SPARK_HOME/README.md
```

File path

```
~/Downloads$ ~/spark/bin/spark-submit --class chapter.one.WordCount --master spa
rk://                :7077 wordcount.jar ~/spark/README.md
```

Result

```
find    1
sc.parallelize(range(1000)).count()     1
contains        1
you     4
project 1
Pi      1
protocols       1
that    2
a       8
or      3
high-level      1
name    1
Hadoop, 2
to      17
available       1
core    1
(You    1
instance:       1
more    1
see     3
of      5
tools   1
"local[N]"      1
programs        2
option  1
package.)       1
["Building      1
must    1
and     9
command,        2
system  1
Hadoop  3
```

If you have any question, please feel free to email TA (woongheelee@hanyang.ac.kr).

Make an appointment and visit the lab.