How to Develop Spark Applications on Windows 10 Using IntelliJ IDEA

Software Installation on WINDOWS 10

- Prerequisites:
 - 1. The Spark commodity cluster has been built on Linux (CentOS is recommended)
 https://github.com/QiqiDuan257/parallel-pso-spark/blob/master/How-to-Install-Spark-on-CentOS7-English.md

Linux can be used for developing, testing, and deploying Spark applications Both Mac OS X and WINDOWS can be only used for developing and testing

- 2. The PC should be in the same LAN with the Spark commodity cluster
- Software installed on WINDOWS 10:
 - 1. Java version 1.8.0_131 use the CMD command "java --version" to validate whether Java can work
 - 2. Scala version 2.11.11

use the CMD command "scala --version" to validate whether Scala can work

3. IntelliJ IDEA (the community version)

https://www.jetbrains.com/idea/download/#section=windows

(NOTE that both the Java and Scala version on WINDOWS 10 should be the same as the corresponding version on the Spark commodity cluster.)

Configure System Environment Variables on WINDOWS 10

• Add the binding of the hostname and IP address of all the nodes on the Spark commodity cluster to the *hosts* file, which is usually located in:

C:\Windows\System32\drivers\etc\hosts

A sample for the *hosts* file:

```
# for the Spark commodity cluster 10.20.51.154 dc001.syhlab dc001 10.20.42.194 dc002.syhlab dc002 dc003.syhlab dc003 dc004.syhlab dc004
```

Configure System Environment Variables on WINDOWS 10

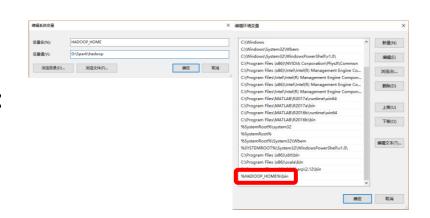
• Download a Hadoop component to a new folder (e.g., "D:\Spark\hadoop"). The website of the Hadoop component is presented below:

https://github.com/srccodes/hadoop-common-2.2.0-bin

Note that the new folder should not include other files.

Configure the following system environment variables:

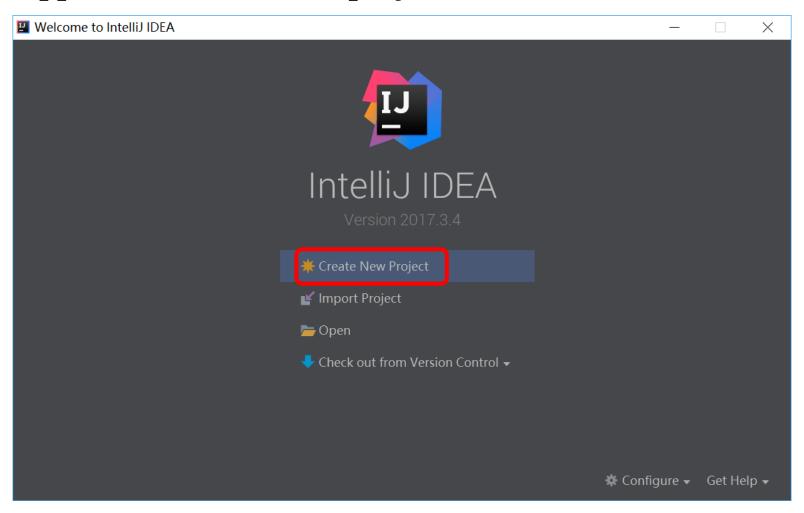
HADOOP_HOME PATH



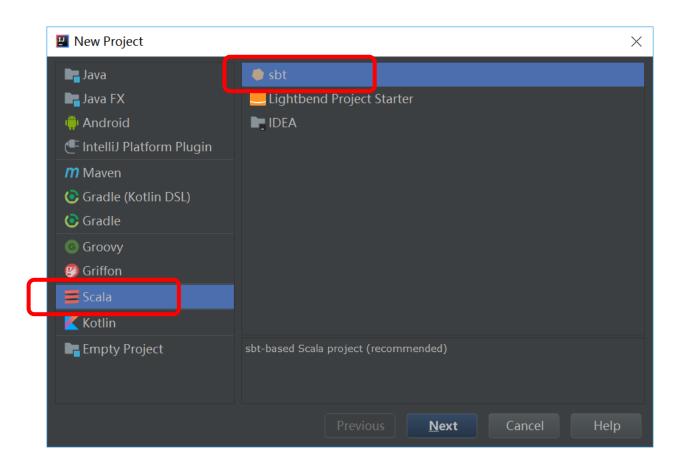
If you can't configure them correctly, the below error may be thrown:

java.io.IOException: Could not locate executable null\bin\winutils.exe in the Hadoop binaries.

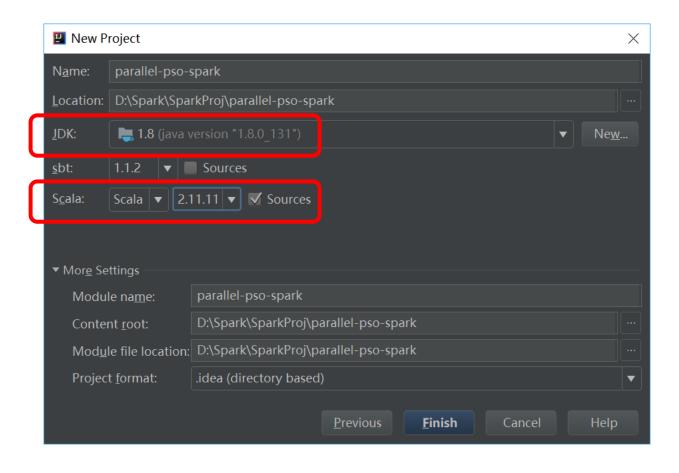
• Create a Spark application: create new project



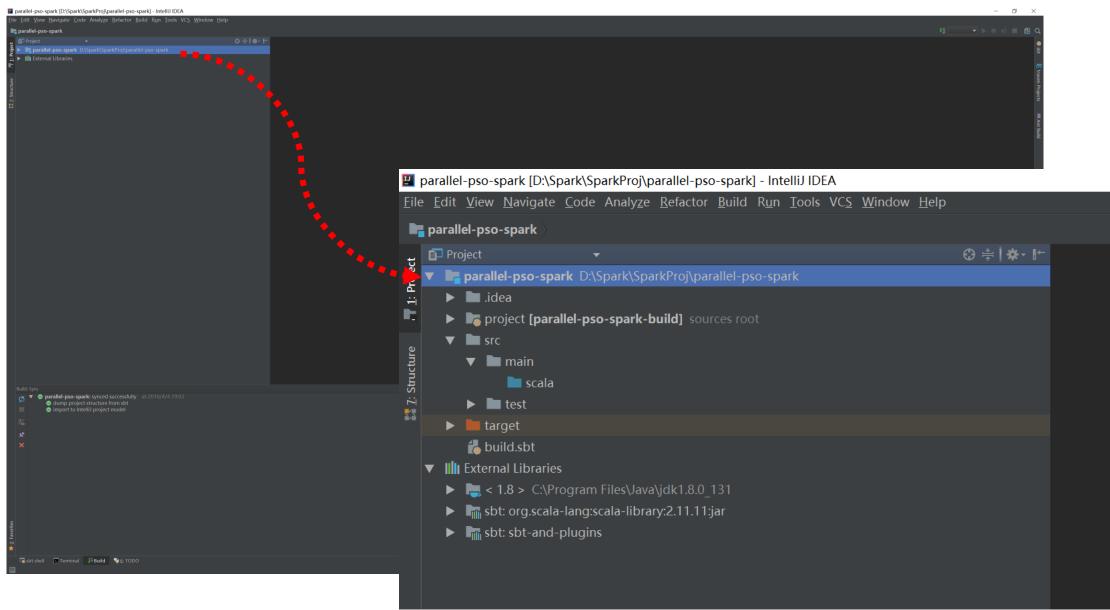
• Create a Spark application: create a sbt project



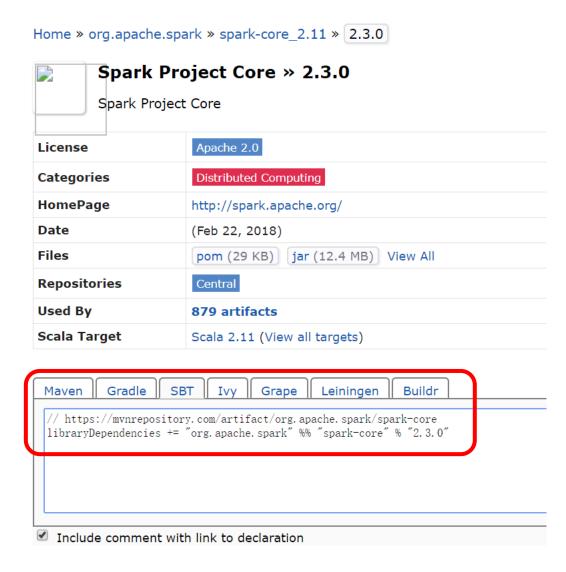
• Create a Spark application: configure the Java, sbt, and Scala version



• Create a Spark application: show the UI when starting the project



• Download all the sbt library dependencies from the website https://mvnrepository.com/ for the Spark application



• Create a Spark application: update the *build.sbt* file, which can automatically load all the library dependencies

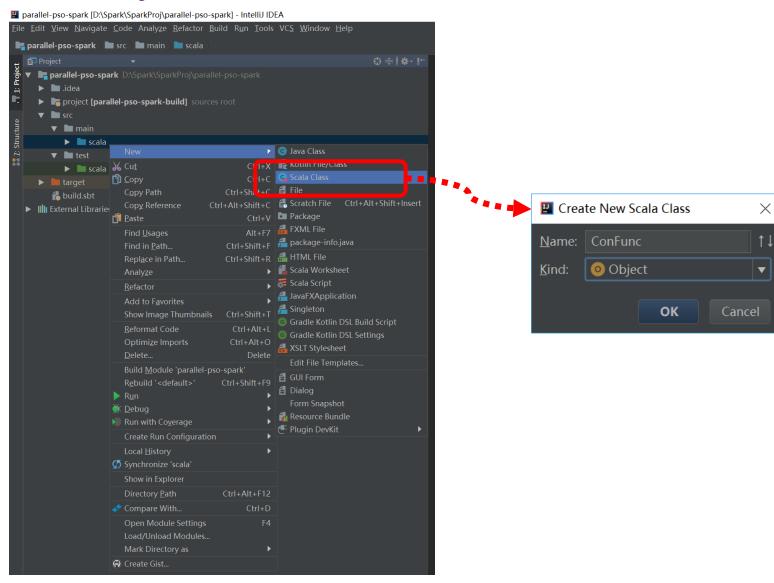
note that you may need wait a long time, which depends on the network speed

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• Create a Spark application: check all the library dependencies automatically loaded

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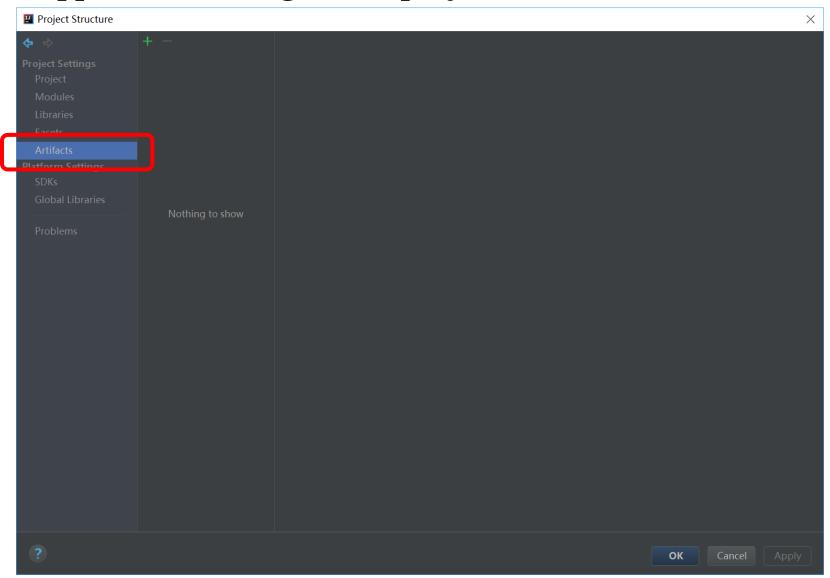
• Create a Spark application: create *Object* (rather than *class*)



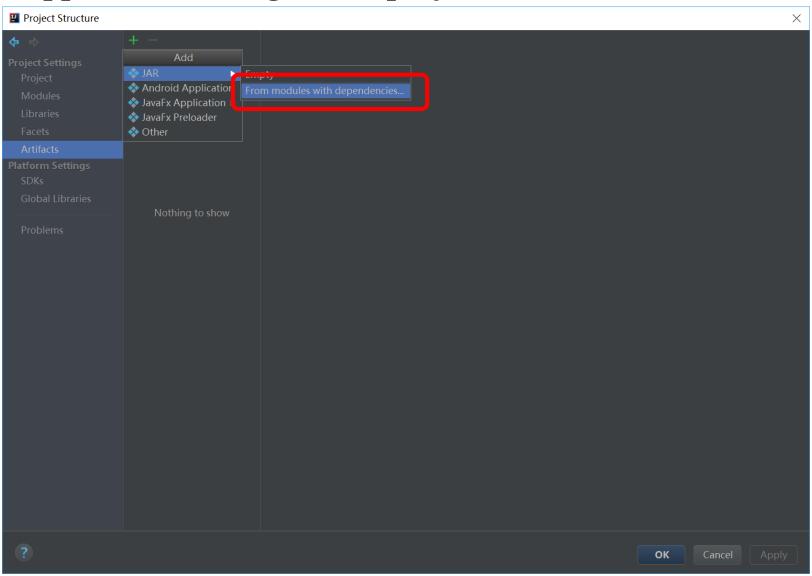
• Create a Spark application: create a simple *demo* program to show how to connect the Spark commodity cluster

```
Jobject DemoConnectSparkCluster extends App {
  val sc = new SparkContext(sparkConf)
  println(f''PI =  \{4.0 * count / numSamples\}\%9.7f'')
```

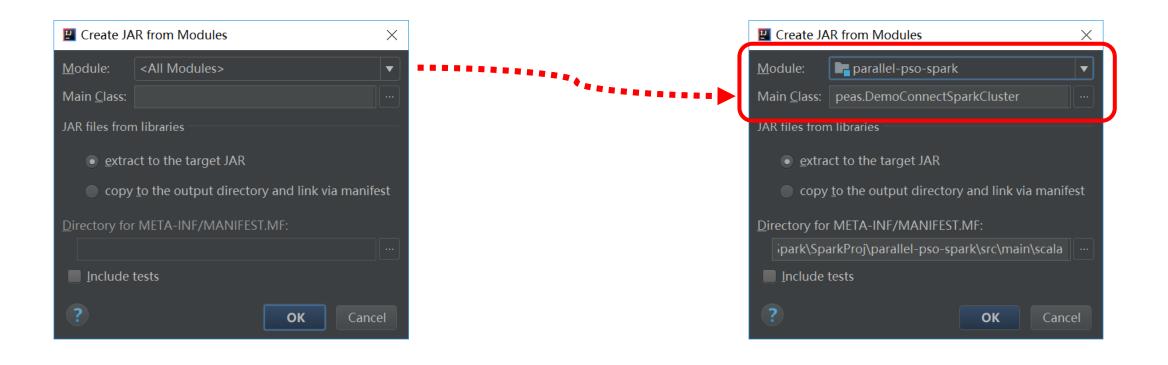
• Create a Spark application: configure the project



• Create a Spark application: configure the project

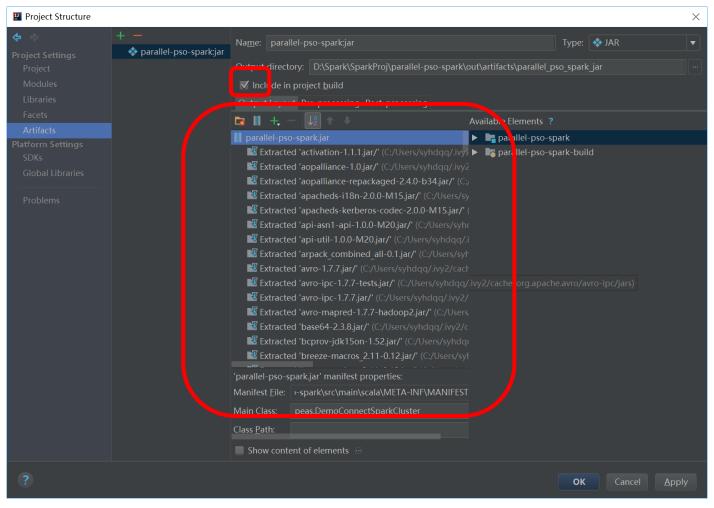


• Create a Spark application: configure the project



• Create a Spark application: configure the project If you can't correctly configure the settings, the below error will be thrown:

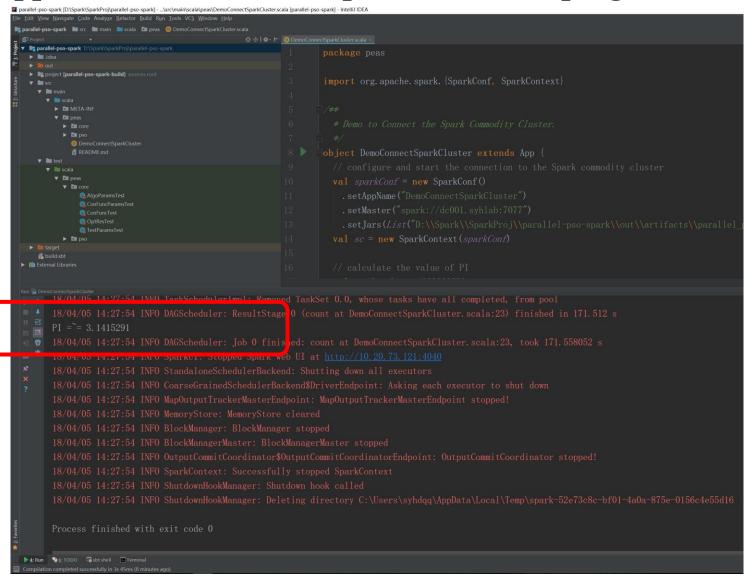
ERROR SparkContext: Failed to add *.jar to Spark environment java.lang.ClassNotFoundException



• Create a Spark application: configure the project If you can't correctly configure the settings, the below error will be thrown:

ERROR SparkContext: Failed to add *.jar to Spark environment java.lang.ClassNotFoundException Project Structure Name: parallel-pso-spark:jar Type: 🔷 JAR parallel-pso-spark:jar Output directory: D:\Spark\Spark\Proj\parallel-pso-spark\out\artifacts\parallel pso spark jar ✓ Include in project build Output Layout Pre-processing Post-processing Available Elements ? 📴 parallel-pso-spark rparallel-pso-spark' compile output arallel-pso-spark-build 'parallel-pso-spark.jar' manifest properties: Manifest File: >-spark\src\main\scala\META-INF\MANIFEST Main Class: peas.DemoConnectSparkCluster Show content of elements ...

• Create a Spark application: show the output of the demo program



• Create a Spark application: monitor the Spark commodity cluster via WEB UI

