How To Install Apache Spark On Windows 10

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Contents

Introduction

Apache Spark is an open-source framework that processes large volumes of stream data from multiple sources. Spark is used in distributed computing with machine learning applications, data analytics, and graph-parallel processing.

This guide will show you **how to install Apache Spark on Windows 10** and test the installation**.**

Prerequisites

- A system running Windows 10
- A user account with administrator privileges (required to install software, modify file permissions, and modify system PATH)
- Command Prompt or Powershell
- A tool to extract .tar files, such as 7-Zip

Install Apache Spark on Windows

Installing Apache Spark on Windows 10 may seem complicated to novice users, but this simple tutorial will have you up and running. If you already have Java 8 and Python 3 installed, you can skip the first two steps.

Step 1: Install Java 8

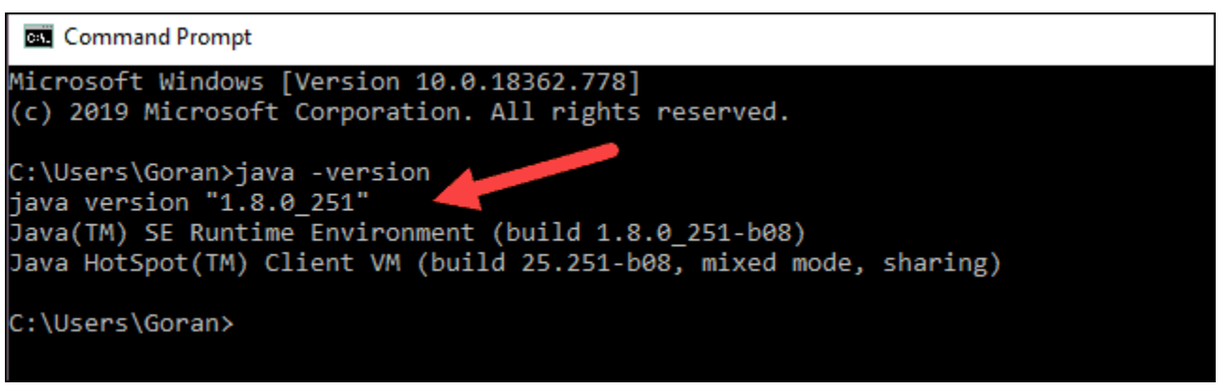
Apache Spark requires Java 8. You can check to see if Java is installed using the command prompt.

Open the command line by clicking **Start** > type *cmd* > click **Command Prompt**.

Type the following command in the command prompt:

```
java -version
```

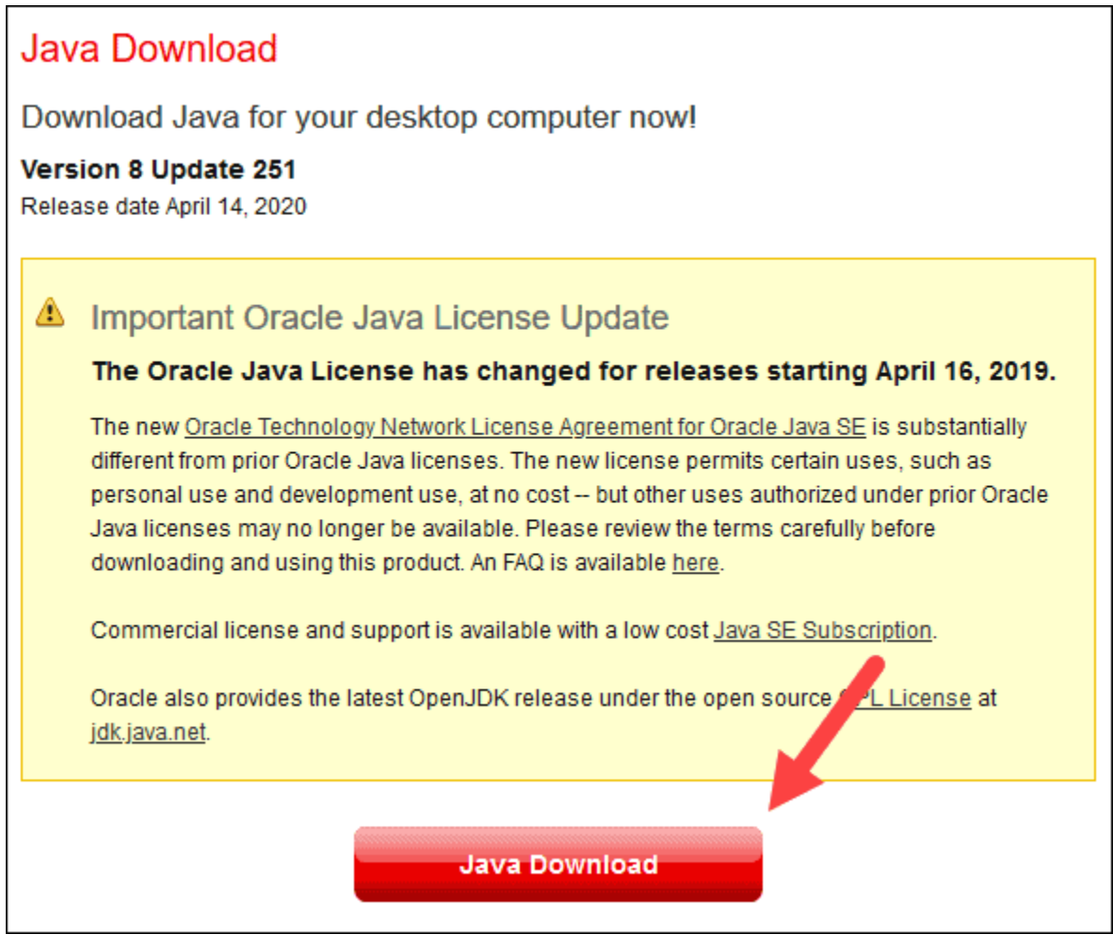
If Java is installed, it will respond with the following output:



Your version may be different. The second digit is the Java version – in this case, Java 8.

If you don't have Java installed:

1. Open a browser window, and navigate to https://java.com/en/download/.



2. Click the **Java Download** button and save the file to a location of your choice.

3. Once the download finishes double-click the file to install Java.

Note: At the time this article was written, the latest Java version is 1.8.0_251. Installing a later

version will still work. This process only needs the Java Runtime Environment (JRE) – the full Development Kit (JDK) is not required. The download link to JDK is https://www.oracle.com/java/technologies/javase-downloads.html.

Step 2: Install Python

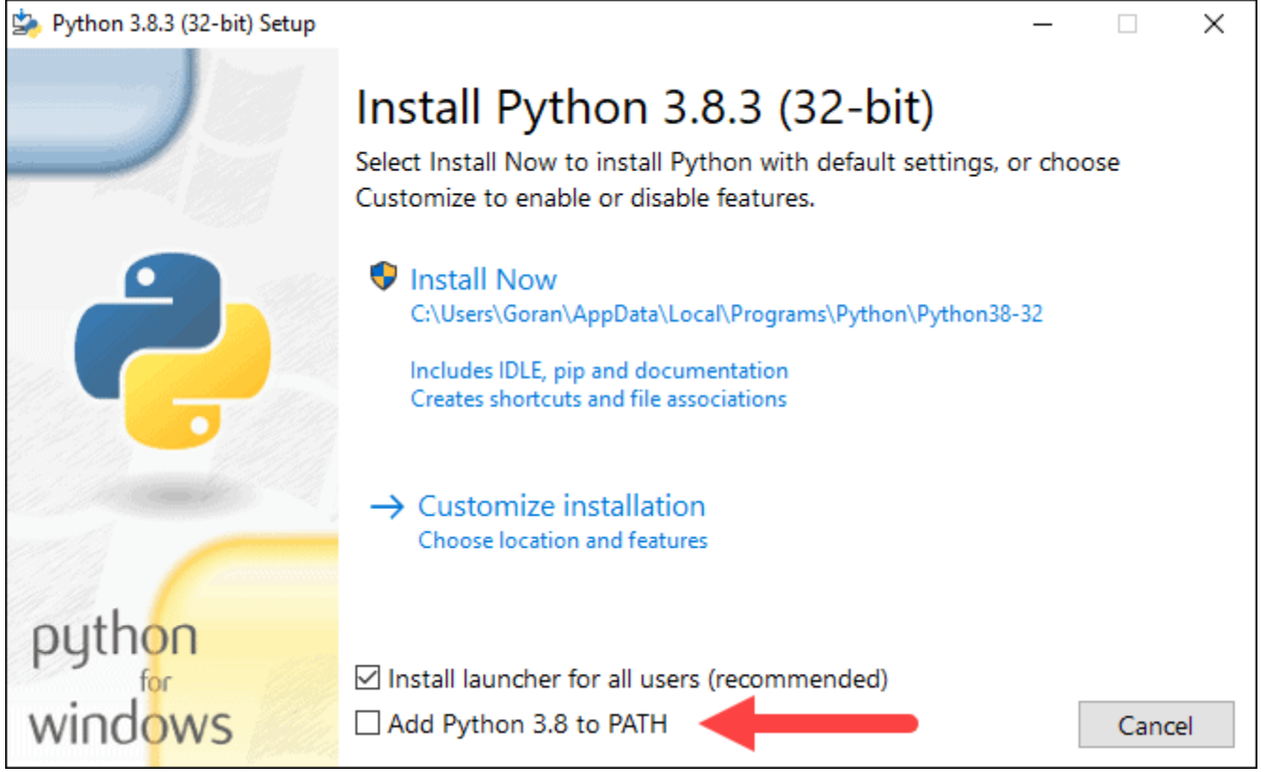
1. To install the Python package manager, navigate to https://www.python.org/ in your web browser.

2. Mouse over the **Download** menu option and click **Python 3.8.3**. 3.8.3 is the latest version at the time of writing the article.

3. Once the download finishes, run the file.

4. Near the bottom of the first setup dialog box, check off *Add Python 3.8 to PATH*. Leave the other box checked.

5. Next, click **Customize installation**.



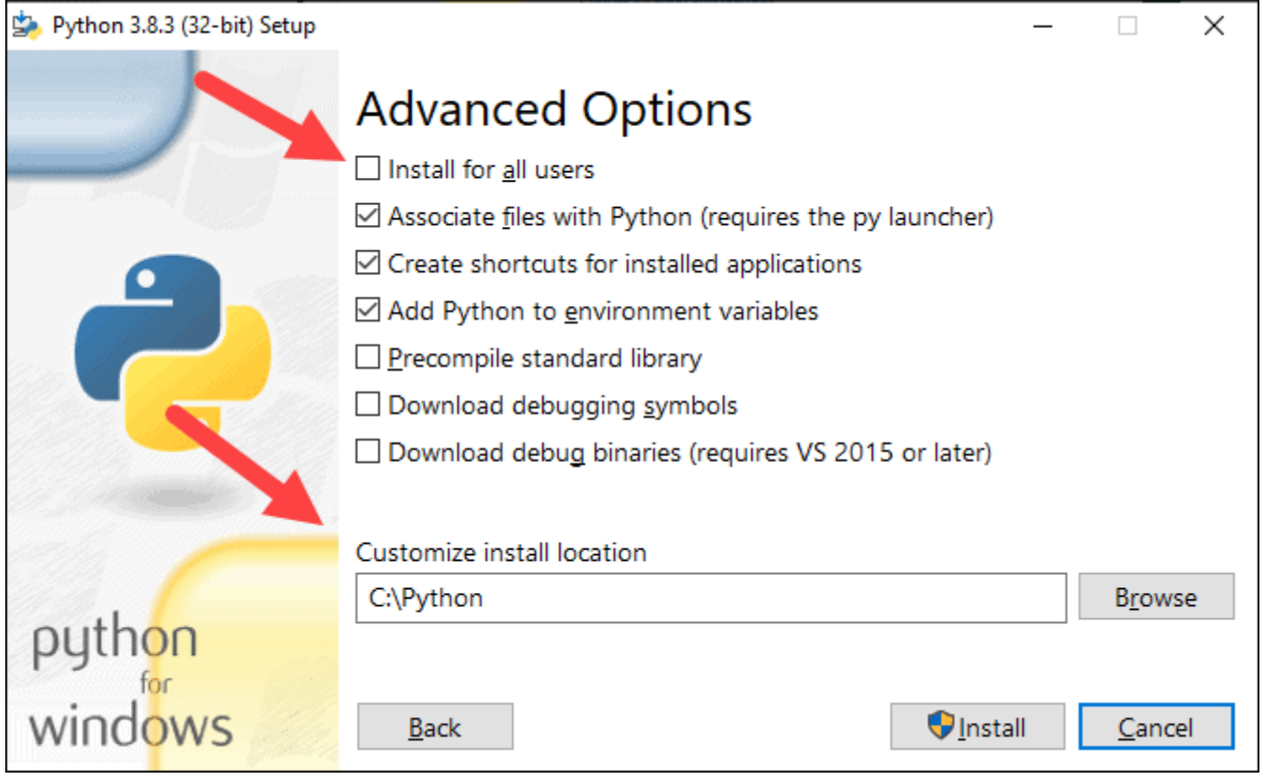
6. You can leave all boxes checked at this step, or you can uncheck the options you do not want.

7. Click **Next**.

8. Select the box **Install for all users** and leave other boxes as they are.

9. Under *Customize install location,* click **Browse** and navigate to the C drive. Add a new folder and name it *Python*.

10. Select that folder and click **OK**.



11. Click **Install**, and let the installation complete.

12. When the installation completes, click the *Disable path length limit* option at the bottom and then click **Close**.

13. If you have a command prompt open, restart it. Verify the installation by checking the version of Python:

```
python --version
```

The output should print `Python 3.8.3`.

Note: For detailed instructions on how to install Python 3 on Windows or how to troubleshoot potential issues, refer to our Install Python 3 on Windows guide.

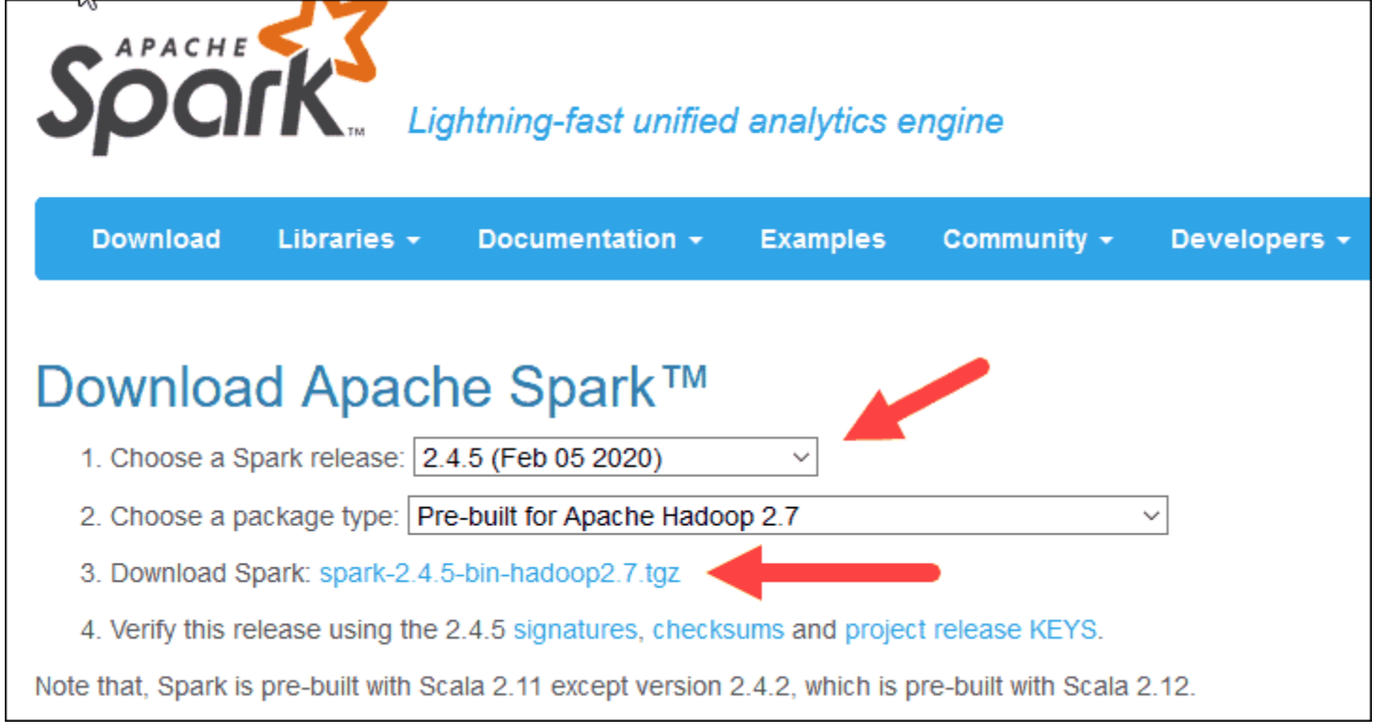
Step 3: Download Apache Spark

1. Open a browser and navigate to https://spark.apache.org/downloads.html.

2. Under the *Download Apache Spark* heading, there are two drop-down menus. Use the current non-preview version.

   - In our case, in ***Choose a Spark release*** drop-down menu select **2.4.5 (Feb 05 2020)**.
   - In the second drop-down ***Choose a package type*****,** leave the selection **Pre-built for Apache Hadoop 2.7**.

3. Click the ***spark-2.4.5-bin-hadoop2.7.tgz*** link.



4. A page with a list of mirrors loads where you can see different servers to download from. Pick any from the list and save the file to your Downloads folder.

Step 4: Verify Spark Software File

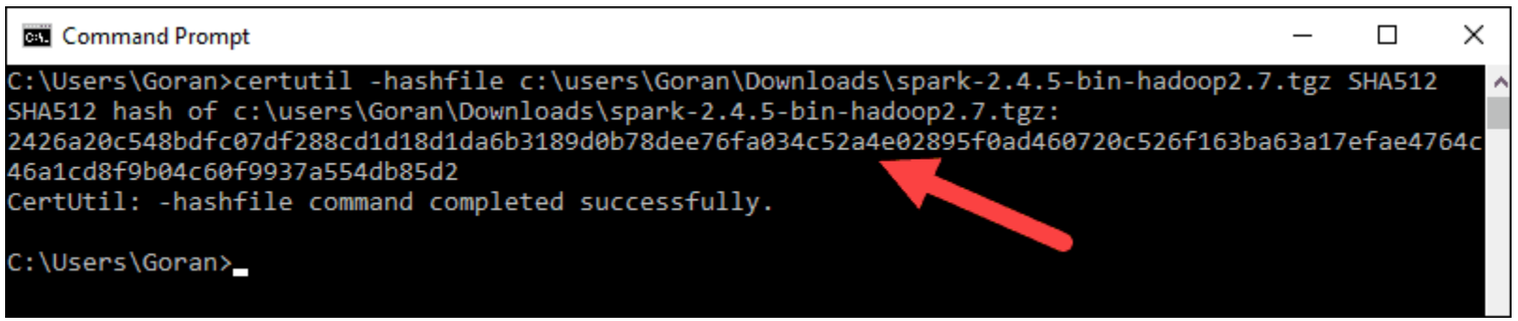
1. Verify the integrity of your download by checking the **checksum** of the file. This ensures you are working with unaltered, uncorrupted software.

2. Navigate back to the *Spark Download* page and open the **Checksum** link, preferably in a new tab.

3. Next, open a command line and enter the following command:

```
certutil -hashfile c:\users\username\Downloads\spark-2.4.5-bin-hadoop2.7.tgz SHA512
```

4. Change the username to your username. The system displays a long alphanumeric code, along with the message **`Certutil: -hashfile completed successfully`**.



5. Compare the code to the one you opened in a new browser tab. If they match, your download file is uncorrupted.

Step 5: Install Apache Spark

Installing Apache Spark involves **extracting the downloaded file** to the desired location.

1. Create a new folder named *Spark* in the root of your C: drive. From a command line, enter the following:

```
cd \

mkdir Spark
```

2. In Explorer, locate the Spark file you downloaded.

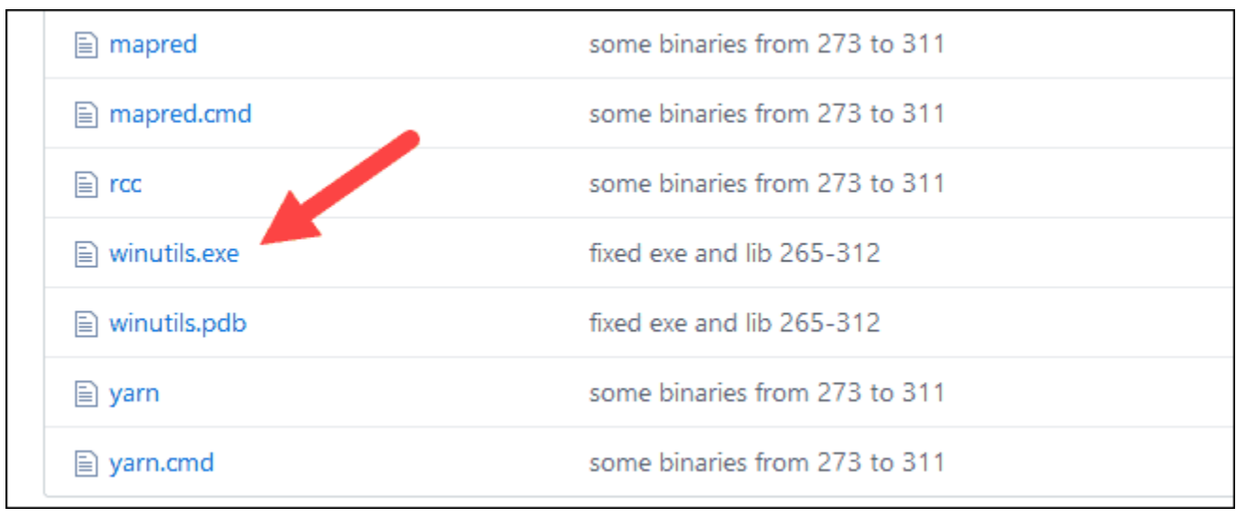
3. Right-click the file and extract it to *C:\Spark* using the tool you have on your system (e.g., 7-Zip).

4. Now, your *C:\Spark* folder has a new folder *spark-2.4.5-bin-hadoop2.7* with the necessary files inside.

Step 6: Add winutils.exe File

Download the **winutils.exe** file for the underlying Hadoop version for the Spark installation you downloaded.

1. Navigate to this URL https://github.com/cdarlint/winutils and inside the **bin** folder, locate **winutils.exe**, and click it.



2. Find the **Download** button on the right side to download the file.

3. Now, create new folders ***Hadoop*** and **bin** on C: using Windows Explorer or the Command Prompt.

4. Copy the winutils.exe file from the Downloads folder to **C:\hadoop\bin**.

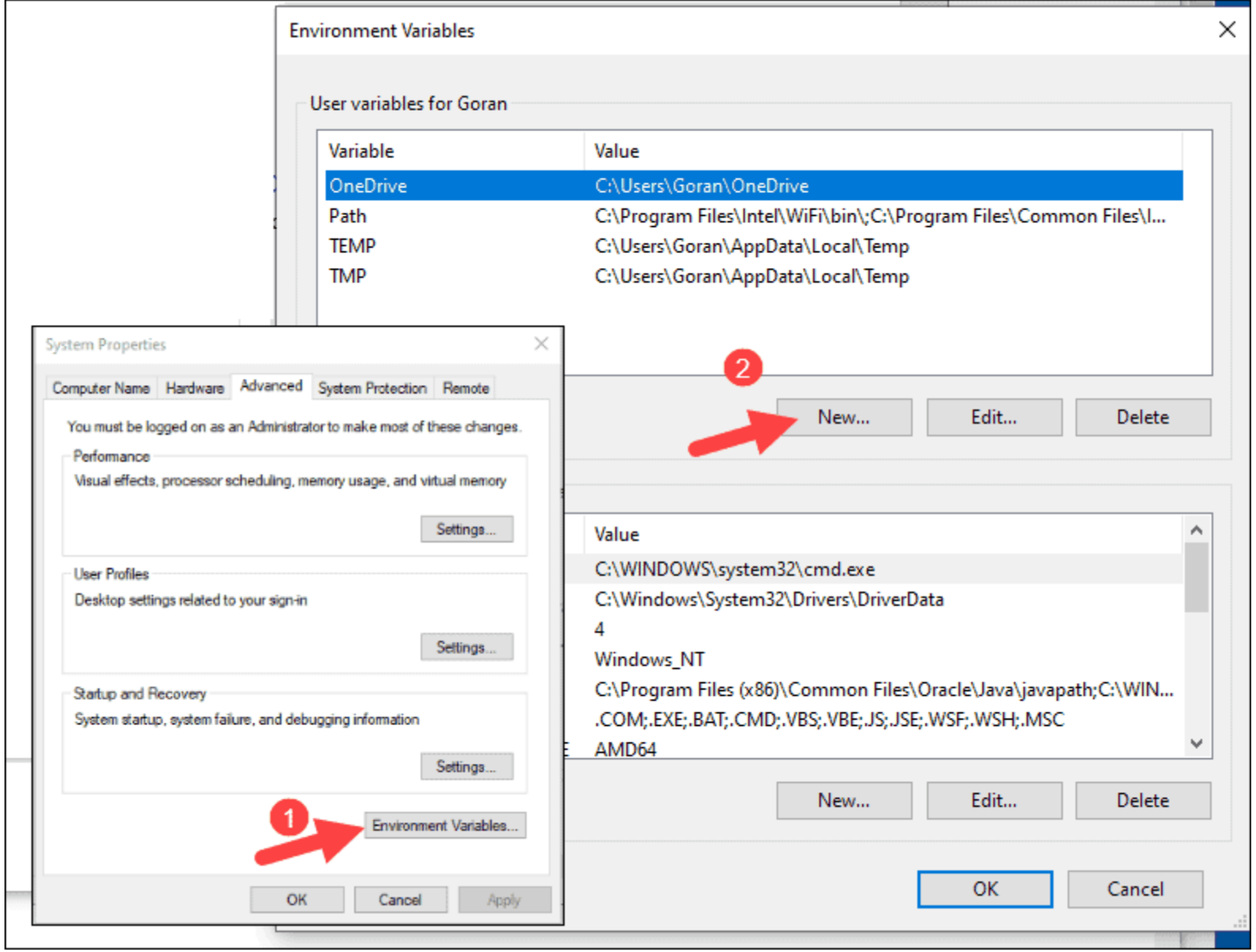
Step 7: Configure Environment Variables

This step adds the Spark and Hadoop locations to your system PATH. It allows you to run the Spark shell directly from a command prompt window.

1. Click **Start** and type *environment*.

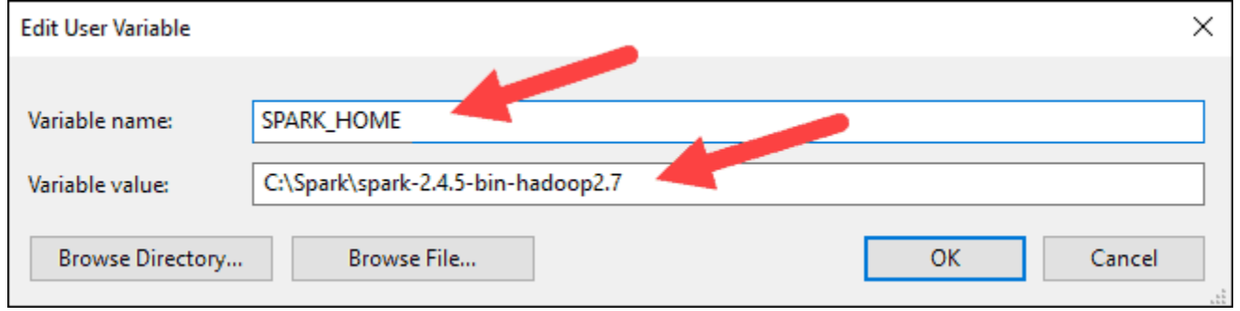
2. Select the result labeled ***Edit the system environment variables***.

3. A System Properties dialog box appears. In the lower-right corner, click **Environment Variables** and then click **New** in the next window.

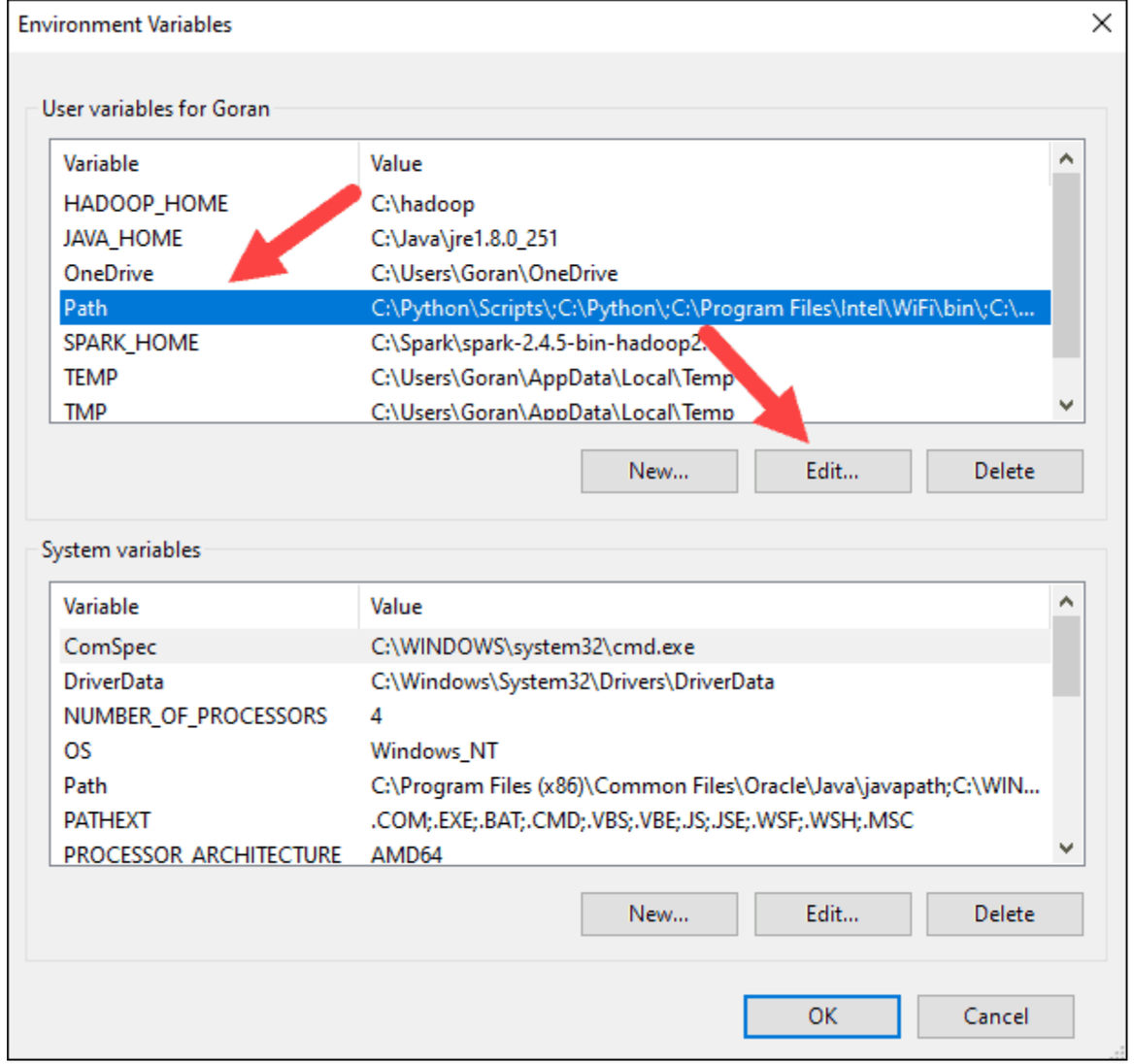


4. For *Variable Name* type ***SPARK_HOME***.

5. For *Variable Value* type **C:\Spark\spark-2.4.5-bin-hadoop2.7** and click OK. If you changed the folder path, use that one instead.

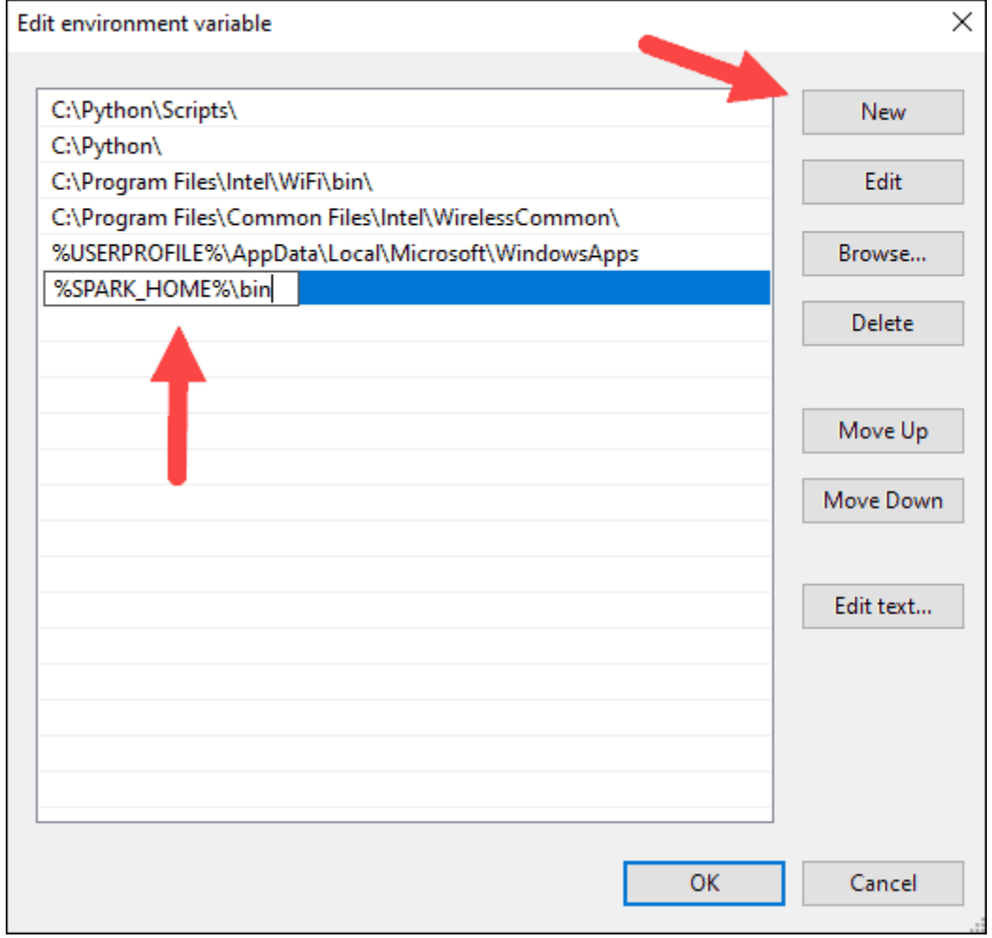


6. In the top box, click the **Path** entry, then click **Edit**. Be careful with editing the system path. Avoid deleting any entries already on the list.



7. You should see a box with entries on the left. On the right, click **New**.

8. The system highlights a new line. Enter the path to the Spark folder **C:\Spark\spark-2.4.5-bin-hadoop2.7\bin**. We recommend using **%SPARK_HOME%\bin** to avoid possible issues with the path.



9. Repeat this process for Hadoop and Java.

- For Hadoop, the variable name is **HADOOP_HOME** and for the value use the path of the folder you created earlier: **C:\hadoop.** Add **C:\hadoop\bin** to the **Path variable** field, but we recommend using **%HADOOP_HOME%\bin**.
- For Java, the variable name is **JAVA_HOME** and for the value use the path to your Java JDK directory (in our case it's **C:\Program Files\Java\jdk1.8.0_251**).

10. Click **OK** to close all open windows.

Note: Star by restarting the Command Prompt to apply changes. If that doesn't work, you will need to reboot the system.

Step 8: Launch Spark

1. Open a new command-prompt window using the right-click and **Run as administrator**:

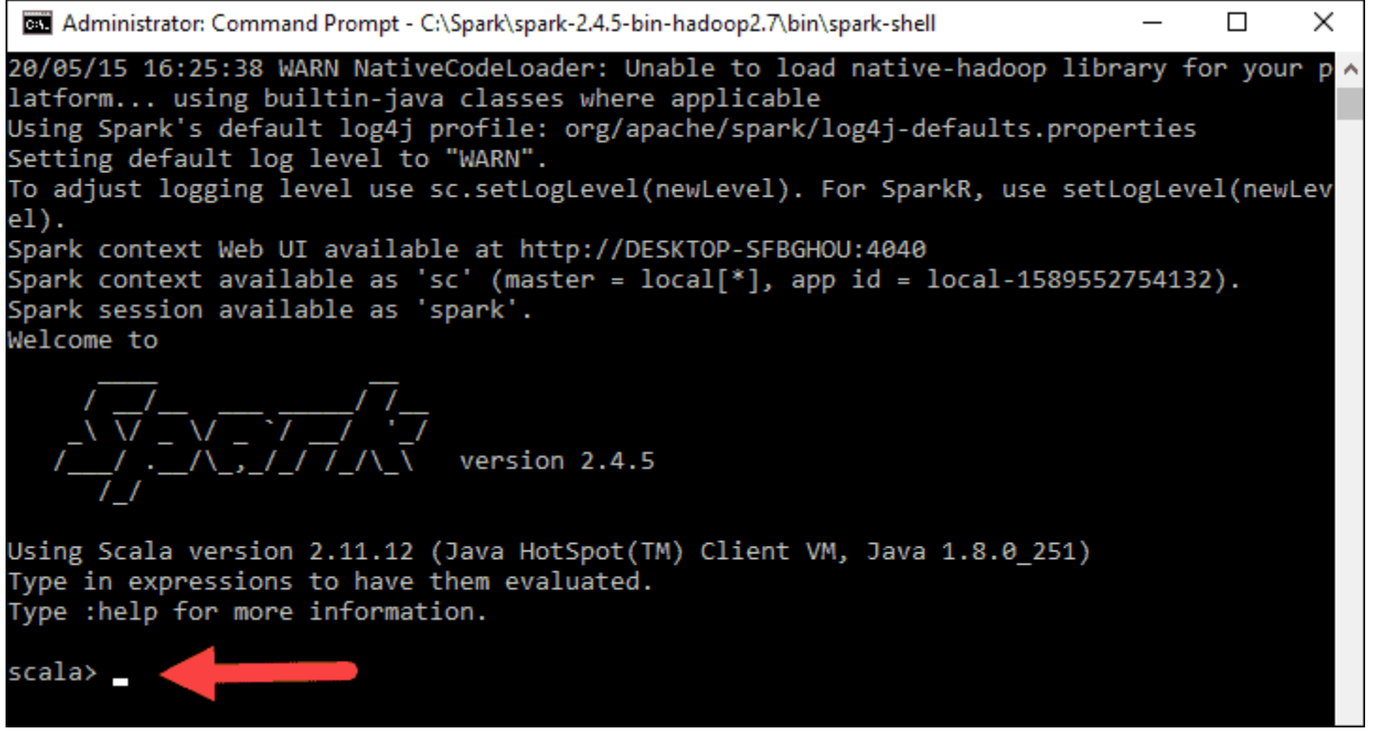
2. To start Spark, enter:

```
C:\Spark\spark-2.4.5-bin-hadoop2.7\bin\spark-shell
```

If you set the **environment path** correctly, you can type `spark-shell` to launch Spark.

3. The system should display several lines indicating the status of the application. You may get a Java pop-up. Select **Allow access** to continue.

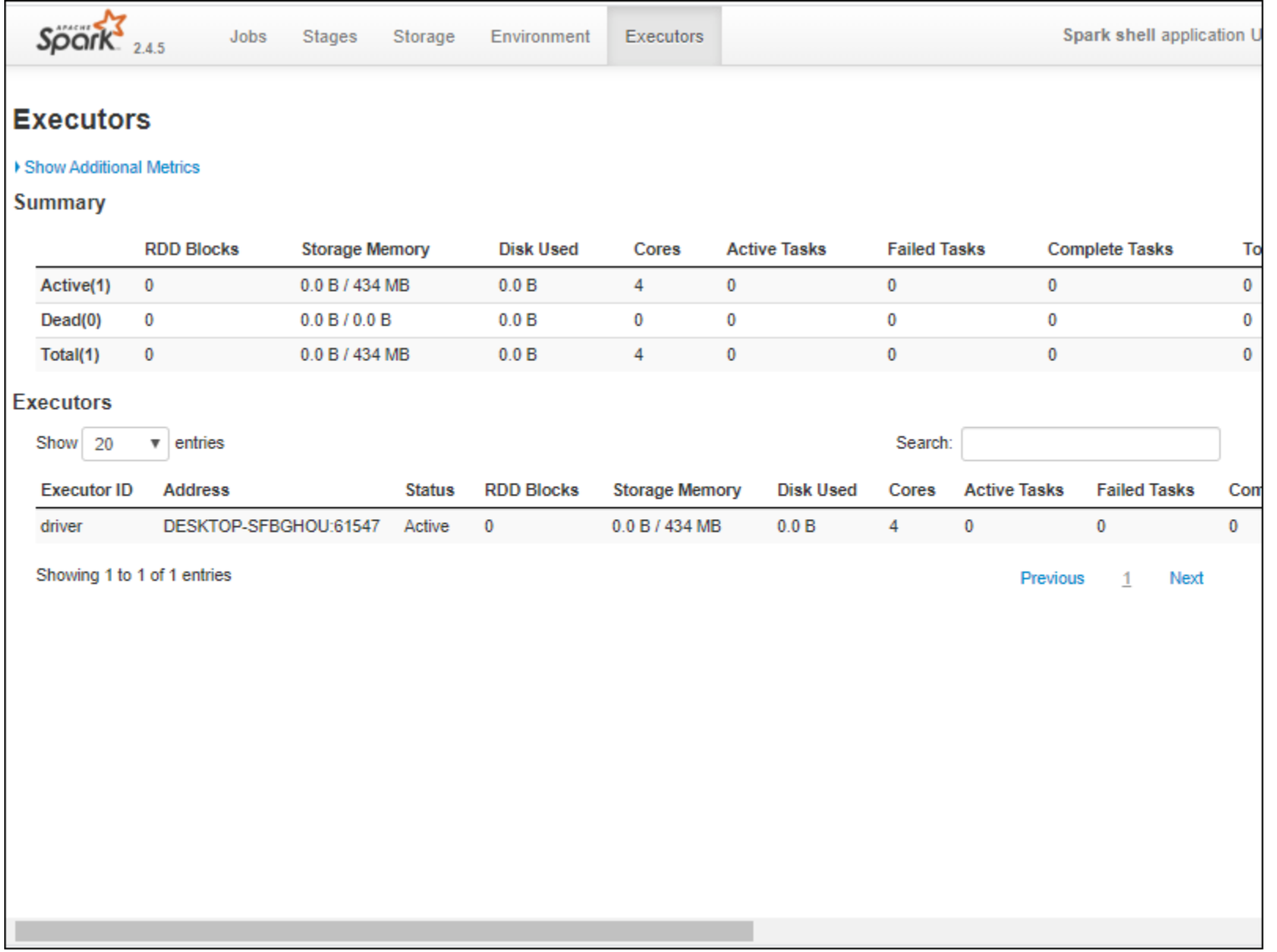
Finally, the Spark logo appears, and the prompt displays the **Scala shell**.



4., Open a web browser and navigate to **http://localhost:4040/**.

5. You can replace **localhost** with the name of your system.

6. You should see an Apache Spark shell Web UI. The example below shows the *Executors* page.



7. To exit Spark and close the Scala shell, press `ctrl-d` in the command-prompt window.

Note: If you installed Python, you can run Spark using Python with this command:

```
pyspark
```

Exit using **`quit()`**.

Test Spark

In this example, we will launch the Spark shell and use Scala to read the contents of a file. You can use an existing file, such as the *README* file in the Spark directory, or you can create your own. We created *pnaptest* with some text.

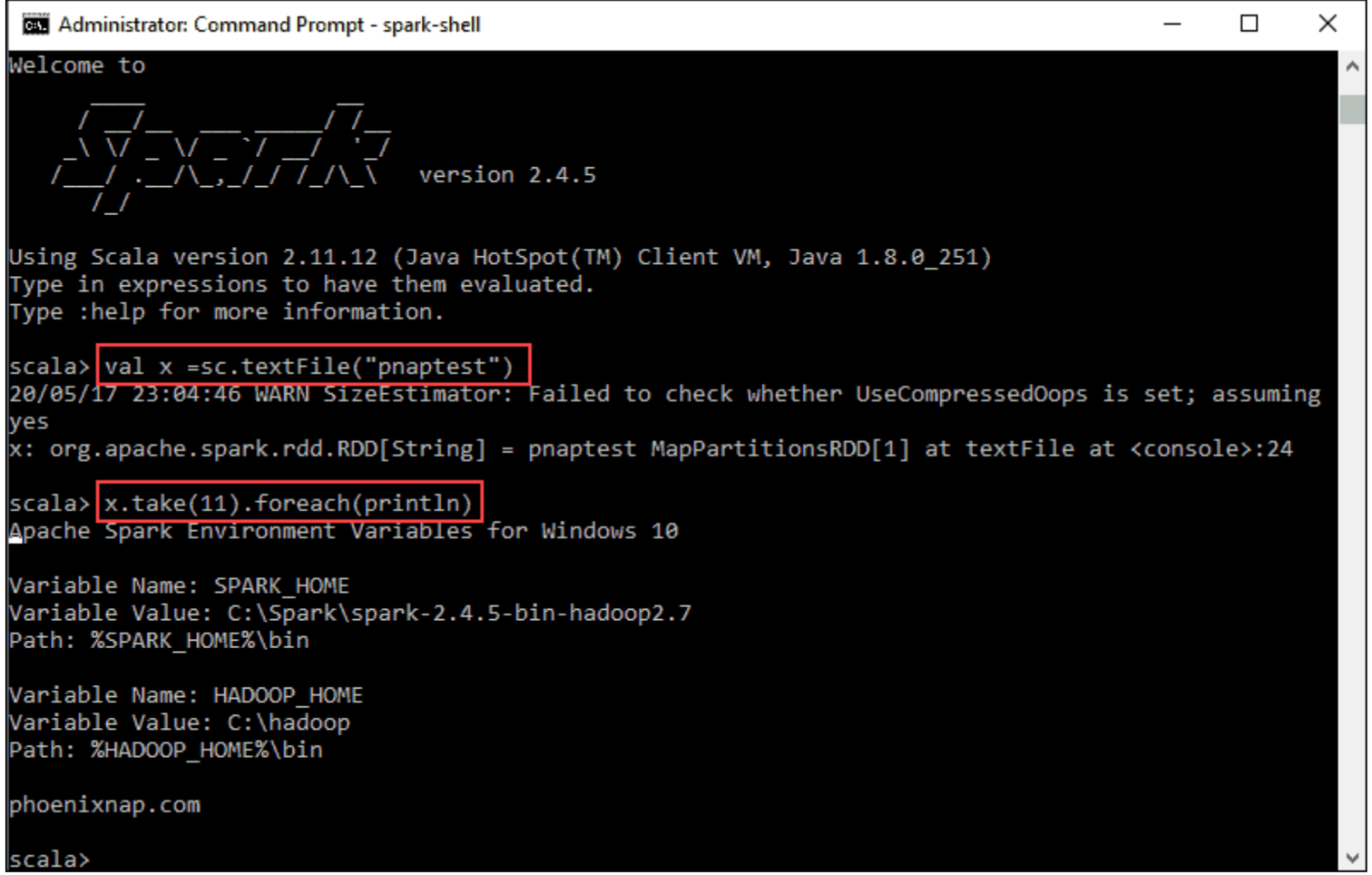
1. Open a command-prompt window and navigate to the folder with the file you want to use and launch the Spark shell.

2. First, state a variable to use in the Spark context with the name of the file. Remember to add the file extension if there is any.

```
val x =sc.textFile("pnaptest")
```

3. The output shows an RDD is created. Then, we can view the file contents by using this command to call an action:

```
x.take(11).foreach(println)
```



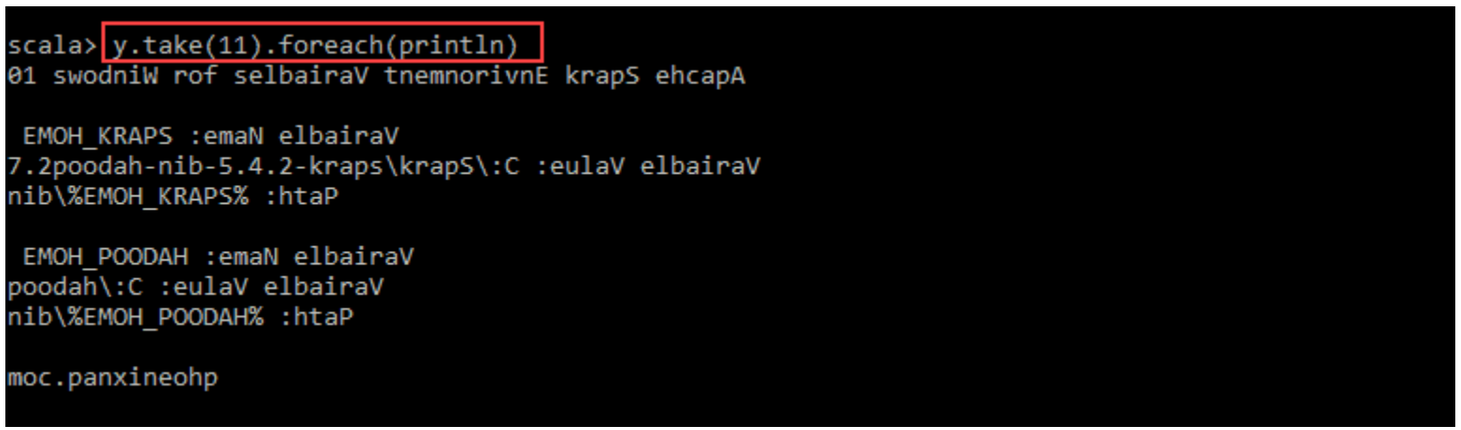
This command instructs Spark to print 11 lines from the file you specified. To perform an action on this file (**value x**), add another value **y**, and do a map transformation.

4. For example, you can print the characters in reverse with this command:

```
val y = x.map(_.reverse)
```

5. The system creates a child RDD in relation to the first one. Then, specify how many lines you want to print from the value **y**:

```
y.take(11).foreach(println)
```



The output prints 11 lines of the *pnaptest* file in the reverse order.

When done, exit the shell using **`ctrl-d`**.

Conclusion

You should now have a working installation of Apache Spark on Windows 10 with all dependencies installed. Get started running an instance of Spark in your Windows environment.

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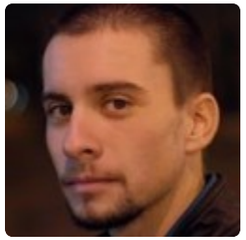

Goran Jevtic

Goran combines his passions for research, writing and technology as a technical writer at phoenixNAP. Working with multiple departments and on a variety of projects, he has developed extraordinary understanding of cloud and virtualization technology trends and best practices.