Learning_Pyspark_part3

August 30, 2022

```
[1]: #The sudo apt-get update command is used to download package information from
     ↪all configured sources
     !sudo apt update

     # innstall java
     !apt-get install openjdk-8-jdk-headless -qq > /dev/null

     # install spark
     !wget -q https://dlcdn.apache.org/spark/spark-3.3.0/spark-3.3.0-bin-hadoop3.tgz

     # unzip the spark file to the current folder
     !tar -xvf spark-3.3.0-bin-hadoop3.tgz

     # install findspark using pip
     !pip install -q findspark

     #For python users, also install pyspark using the following command.
     !pip install pyspark
```

```
Hit:1 http://security.ubuntu.com/ubuntu bionic-security InRelease
Hit:2 http://archive.ubuntu.com/ubuntu bionic InRelease
Hit:3 http://archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:4 https://cloud.r-project.org/bin/linux/ubuntu bionic-cran40/ InRelease
Hit:5 http://archive.ubuntu.com/ubuntu bionic-backports InRelease
Ign:6 https://developer.download.nvidia.com/compute/machine-
learning/repos/ubuntu1804/x86_64  InRelease
Hit:7 https://developer.download.nvidia.com/compute/cuda/repos/ubuntu1804/x86_64
InRelease
Hit:8 http://ppa.launchpad.net/c2d4u.team/c2d4u4.0+/ubuntu bionic InRelease
Hit:9 https://developer.download.nvidia.com/compute/machine-
learning/repos/ubuntu1804/x86_64  Release
Hit:10 http://ppa.launchpad.net/cran/libgit2/ubuntu bionic InRelease
Hit:11 http://ppa.launchpad.net/deadsnakes/ppa/ubuntu bionic InRelease
Hit:12 http://ppa.launchpad.net/graphics-drivers/ppa/ubuntu bionic InRelease
Reading package lists… Done
Building dependency tree
Reading state information… Done
```

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43 packages can be upgraded. Run 'apt list --upgradable' to see them.
spark-3.3.0-bin-hadoop3/
spark-3.3.0-bin-hadoop3/NOTICE
spark-3.3.0-bin-hadoop3/kubernetes/
spark-3.3.0-bin-hadoop3/kubernetes/tests/
spark-3.3.0-bin-hadoop3/kubernetes/tests/python_executable_check.py
spark-3.3.0-bin-hadoop3/kubernetes/tests/autoscale.py
spark-3.3.0-bin-hadoop3/kubernetes/tests/worker_memory_check.py
spark-3.3.0-bin-hadoop3/kubernetes/tests/py_container_checks.py
spark-3.3.0-bin-hadoop3/kubernetes/tests/decommissioning.py
spark-3.3.0-bin-hadoop3/kubernetes/tests/pyfiles.py
spark-3.3.0-bin-hadoop3/kubernetes/tests/decommissioning_cleanup.py
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/spark/
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/spark/decom.sh
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/spark/entrypoint.sh
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/spark/bindings/
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/spark/bindings/R/
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/spark/bindings/R/Dockerfile
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/spark/bindings/python/
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/spark/bindings/python/Dockerfile
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/spark/Dockerfile
spark-3.3.0-bin-hadoop3/kubernetes/dockerfiles/spark/Dockerfile.java17
spark-3.3.0-bin-hadoop3/jars/
spark-3.3.0-bin-hadoop3/jars/spark-network-shuffle_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/shapeless_2.12-2.3.7.jar
spark-3.3.0-bin-hadoop3/jars/arrow-format-7.0.0.jar
spark-3.3.0-bin-hadoop3/jars/metrics-jvm-4.2.7.jar
spark-3.3.0-bin-hadoop3/jars/spark-tags_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/okhttp-3.12.12.jar
spark-3.3.0-bin-hadoop3/jars/hive-shims-common-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/spire_2.12-0.17.0.jar
spark-3.3.0-bin-hadoop3/jars/logging-interceptor-3.12.12.jar
spark-3.3.0-bin-hadoop3/jars/hive-serde-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/objenesis-3.2.jar
spark-3.3.0-bin-hadoop3/jars/spark-streaming_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/avro-1.11.0.jar
spark-3.3.0-bin-hadoop3/jars/zookeeper-3.6.2.jar
spark-3.3.0-bin-hadoop3/jars/spark-kvstore_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/kryo-shaded-4.0.2.jar
spark-3.3.0-bin-hadoop3/jars/hive-jdbc-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/jackson-annotations-2.13.3.jar
spark-3.3.0-bin-hadoop3/jars/commons-logging-1.1.3.jar
spark-3.3.0-bin-hadoop3/jars/commons-compiler-3.0.16.jar
spark-3.3.0-bin-hadoop3/jars/spark-sql_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/jdo-api-3.0.1.jar
spark-3.3.0-bin-hadoop3/jars/pickle-1.2.jar
spark-3.3.0-bin-hadoop3/jars/JLargeArrays-1.5.jar
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spark-3.3.0-bin-hadoop3/jars/kubernetes-model-apiextensions-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/parquet-common-1.12.2.jar
spark-3.3.0-bin-hadoop3/jars/httpcore-4.4.14.jar
spark-3.3.0-bin-hadoop3/jars/commons-codec-1.15.jar
spark-3.3.0-bin-hadoop3/jars/parquet-format-structures-1.12.2.jar
spark-3.3.0-bin-hadoop3/jars/commons-io-2.11.0.jar
spark-3.3.0-bin-hadoop3/jars/stax-api-1.0.1.jar
spark-3.3.0-bin-hadoop3/jars/hive-storage-api-2.7.2.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-certificates-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/zookeeper-jute-3.6.2.jar
spark-3.3.0-bin-hadoop3/jars/spark-yarn_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/commons-collections4-4.4.jar
spark-3.3.0-bin-hadoop3/jars/jline-2.14.6.jar
spark-3.3.0-bin-hadoop3/jars/dropwizard-metrics-hadoop-
metrics2-reporter-0.1.2.jar
spark-3.3.0-bin-hadoop3/jars/commons-pool-1.5.4.jar
spark-3.3.0-bin-hadoop3/jars/snakeyaml-1.30.jar
spark-3.3.0-bin-hadoop3/jars/xbean-asm9-shaded-4.20.jar
spark-3.3.0-bin-hadoop3/jars/lz4-java-1.8.0.jar
spark-3.3.0-bin-hadoop3/jars/cats-kernel_2.12-2.1.1.jar
spark-3.3.0-bin-hadoop3/jars/jta-1.1.jar
spark-3.3.0-bin-hadoop3/jars/istack-commons-runtime-3.0.8.jar
spark-3.3.0-bin-hadoop3/jars/jackson-module-scala_2.12-2.13.3.jar
spark-3.3.0-bin-hadoop3/jars/hive-common-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/shims-0.9.25.jar
spark-3.3.0-bin-hadoop3/jars/compress-lzf-1.1.jar
spark-3.3.0-bin-hadoop3/jars/commons-collections-3.2.2.jar
spark-3.3.0-bin-hadoop3/jars/audience-annotations-0.5.0.jar
spark-3.3.0-bin-hadoop3/jars/joda-time-2.10.13.jar
spark-3.3.0-bin-hadoop3/jars/jpam-1.1.jar
spark-3.3.0-bin-hadoop3/jars/jakarta.annotation-api-1.3.5.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-coordination-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/tink-1.6.1.jar
spark-3.3.0-bin-hadoop3/jars/metrics-json-4.2.7.jar
spark-3.3.0-bin-hadoop3/jars/spark-kubernetes_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/jersey-common-2.34.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-common-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/spark-graphx_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/parquet-hadoop-1.12.2.jar
spark-3.3.0-bin-hadoop3/jars/curator-recipes-2.13.0.jar
spark-3.3.0-bin-hadoop3/jars/zstd-jni-1.5.2-1.jar
spark-3.3.0-bin-hadoop3/jars/commons-math3-3.6.1.jar
spark-3.3.0-bin-hadoop3/jars/spark-tags_2.12-3.3.0-tests.jar
spark-3.3.0-bin-hadoop3/jars/orc-shims-1.7.4.jar
spark-3.3.0-bin-hadoop3/jars/netty-transport-4.1.74.Final.jar
spark-3.3.0-bin-hadoop3/jars/netty-tcnative-classes-2.0.48.Final.jar
spark-3.3.0-bin-hadoop3/jars/spark-launcher_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/antlr4-runtime-4.8.jar
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spark-3.3.0-bin-hadoop3/jars/javax.jdo-3.2.0-m3.jar
spark-3.3.0-bin-hadoop3/jars/spark-hive-thriftserver_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/paranamer-2.8.jar
spark-3.3.0-bin-hadoop3/jars/spark-network-common_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/netty-all-4.1.74.Final.jar
spark-3.3.0-bin-hadoop3/jars/arrow-memory-core-7.0.0.jar
spark-3.3.0-bin-hadoop3/jars/orc-core-1.7.4.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-storageclass-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/flatbuffers-java-1.12.0.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-autoscaling-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/json4s-core_2.12-3.7.0-M11.jar
spark-3.3.0-bin-hadoop3/jars/stream-2.9.6.jar
spark-3.3.0-bin-hadoop3/jars/log4j-core-2.17.2.jar
spark-3.3.0-bin-hadoop3/jars/arpack-2.2.1.jar
spark-3.3.0-bin-hadoop3/jars/avro-ipc-1.11.0.jar
spark-3.3.0-bin-hadoop3/jars/hive-shims-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/datanucleus-api-jdo-4.2.4.jar
spark-3.3.0-bin-hadoop3/jars/gson-2.2.4.jar
spark-3.3.0-bin-hadoop3/jars/jersey-container-servlet-2.34.jar
spark-3.3.0-bin-hadoop3/jars/commons-compress-1.21.jar
spark-3.3.0-bin-hadoop3/jars/curator-client-2.13.0.jar
spark-3.3.0-bin-hadoop3/jars/opencsv-2.3.jar
spark-3.3.0-bin-hadoop3/jars/hive-exec-2.3.9-core.jar
spark-3.3.0-bin-hadoop3/jars/jsr305-3.0.0.jar
spark-3.3.0-bin-hadoop3/jars/netty-transport-native-epoll-4.1.74.Final-
linux-x86_64.jar
spark-3.3.0-bin-hadoop3/jars/derby-10.14.2.0.jar
spark-3.3.0-bin-hadoop3/jars/spark-catalyst_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/commons-dbcp-1.4.jar
spark-3.3.0-bin-hadoop3/jars/scala-reflect-2.12.15.jar
spark-3.3.0-bin-hadoop3/jars/okio-1.14.0.jar
spark-3.3.0-bin-hadoop3/jars/hk2-api-2.6.1.jar
spark-3.3.0-bin-hadoop3/jars/netty-transport-native-epoll-4.1.74.Final-linux-
aarch_64.jar
spark-3.3.0-bin-hadoop3/jars/hive-shims-0.23-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/spark-hive_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/jakarta.servlet-api-4.0.3.jar
spark-3.3.0-bin-hadoop3/jars/commons-lang3-3.12.0.jar
spark-3.3.0-bin-hadoop3/jars/automaton-1.11-8.jar
spark-3.3.0-bin-hadoop3/jars/commons-lang-2.6.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-core-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/ivy-2.5.0.jar
spark-3.3.0-bin-hadoop3/jars/hk2-utils-2.6.1.jar
spark-3.3.0-bin-hadoop3/jars/parquet-column-1.12.2.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-events-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-node-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/velocity-1.5.jar
spark-3.3.0-bin-hadoop3/jars/netty-buffer-4.1.74.Final.jar
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spark-3.3.0-bin-hadoop3/jars/httpclient-4.5.13.jar
spark-3.3.0-bin-hadoop3/jars/JTransforms-3.1.jar
spark-3.3.0-bin-hadoop3/jars/netty-handler-4.1.74.Final.jar
spark-3.3.0-bin-hadoop3/jars/json4s-scalap_2.12-3.7.0-M11.jar
spark-3.3.0-bin-hadoop3/jars/slf4j-api-1.7.32.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-rbac-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/spark-repl_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-discovery-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/RoaringBitmap-0.9.25.jar
spark-3.3.0-bin-hadoop3/jars/jersey-server-2.34.jar
spark-3.3.0-bin-hadoop3/jars/netty-transport-classes-kqueue-4.1.74.Final.jar
spark-3.3.0-bin-hadoop3/jars/aircompressor-0.21.jar
spark-3.3.0-bin-hadoop3/jars/arrow-vector-7.0.0.jar
spark-3.3.0-bin-hadoop3/jars/jackson-core-2.13.3.jar
spark-3.3.0-bin-hadoop3/jars/jcl-over-slf4j-1.7.32.jar
spark-3.3.0-bin-hadoop3/jars/metrics-core-4.2.7.jar
spark-3.3.0-bin-hadoop3/jars/spark-core_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/jakarta.validation-api-2.0.2.jar
spark-3.3.0-bin-hadoop3/jars/jul-to-slf4j-1.7.32.jar
spark-3.3.0-bin-hadoop3/jars/netty-transport-native-kqueue-4.1.74.Final-
osx-x86_64.jar
spark-3.3.0-bin-hadoop3/jars/guava-14.0.1.jar
spark-3.3.0-bin-hadoop3/jars/parquet-jackson-1.12.2.jar
spark-3.3.0-bin-hadoop3/jars/zjsonpatch-0.3.0.jar
spark-3.3.0-bin-hadoop3/jars/hive-service-rpc-3.1.2.jar
spark-3.3.0-bin-hadoop3/jars/metrics-graphite-4.2.7.jar
spark-3.3.0-bin-hadoop3/jars/oro-2.0.8.jar
spark-3.3.0-bin-hadoop3/jars/commons-text-1.9.jar
spark-3.3.0-bin-hadoop3/jars/libfb303-0.9.3.jar
spark-3.3.0-bin-hadoop3/jars/core-1.1.2.jar
spark-3.3.0-bin-hadoop3/jars/avro-mapred-1.11.0.jar
spark-3.3.0-bin-hadoop3/jars/datanucleus-rdbms-4.1.19.jar
spark-3.3.0-bin-hadoop3/jars/super-csv-2.2.0.jar
spark-3.3.0-bin-hadoop3/jars/hadoop-yarn-server-web-proxy-3.3.2.jar
spark-3.3.0-bin-hadoop3/jars/scala-compiler-2.12.15.jar
spark-3.3.0-bin-hadoop3/jars/log4j-api-2.17.2.jar
spark-3.3.0-bin-hadoop3/jars/osgi-resource-locator-1.0.3.jar
spark-3.3.0-bin-hadoop3/jars/spark-sketch_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/hadoop-client-api-3.3.2.jar
spark-3.3.0-bin-hadoop3/jars/arrow-memory-netty-7.0.0.jar
spark-3.3.0-bin-hadoop3/jars/json-1.8.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-policy-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/antlr-runtime-3.5.2.jar
spark-3.3.0-bin-hadoop3/jars/jackson-datatype-jsr310-2.13.3.jar
spark-3.3.0-bin-hadoop3/jars/jackson-databind-2.13.3.jar
spark-3.3.0-bin-hadoop3/jars/spark-mllib_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/netty-transport-classes-epoll-4.1.74.Final.jar
spark-3.3.0-bin-hadoop3/jars/threeten-extra-1.5.0.jar
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spark-3.3.0-bin-hadoop3/jars/kubernetes-client-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/scala-library-2.12.15.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-metrics-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/snappy-java-1.1.8.4.jar
spark-3.3.0-bin-hadoop3/jars/activation-1.1.1.jar
spark-3.3.0-bin-hadoop3/jars/annotations-17.0.0.jar
spark-3.3.0-bin-hadoop3/jars/commons-crypto-1.1.0.jar
spark-3.3.0-bin-hadoop3/jars/log4j-1.2-api-2.17.2.jar
spark-3.3.0-bin-hadoop3/jars/libthrift-0.12.0.jar
spark-3.3.0-bin-hadoop3/jars/HikariCP-2.5.1.jar
spark-3.3.0-bin-hadoop3/jars/generex-1.0.2.jar
spark-3.3.0-bin-hadoop3/jars/leveldbjni-all-1.8.jar
spark-3.3.0-bin-hadoop3/jars/jaxb-runtime-2.3.2.jar
spark-3.3.0-bin-hadoop3/jars/rocksdbjni-6.20.3.jar
spark-3.3.0-bin-hadoop3/jars/netty-transport-native-unix-common-4.1.74.Final.jar
spark-3.3.0-bin-hadoop3/jars/lapack-2.2.1.jar
spark-3.3.0-bin-hadoop3/jars/jackson-core-asl-1.9.13.jar
spark-3.3.0-bin-hadoop3/jars/spark-mllib-local_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/hive-cli-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/hive-beeline-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/scala-xml_2.12-1.2.0.jar
spark-3.3.0-bin-hadoop3/jars/hk2-locator-2.6.1.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-apps-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/metrics-jmx-4.2.7.jar
spark-3.3.0-bin-hadoop3/jars/jackson-mapper-asl-1.9.13.jar
spark-3.3.0-bin-hadoop3/jars/blas-2.2.1.jar
spark-3.3.0-bin-hadoop3/jars/ST4-4.0.4.jar
spark-3.3.0-bin-hadoop3/jars/jackson-dataformat-yaml-2.13.3.jar
spark-3.3.0-bin-hadoop3/jars/chill_2.12-0.10.0.jar
spark-3.3.0-bin-hadoop3/jars/json4s-jackson_2.12-3.7.0-M11.jar
spark-3.3.0-bin-hadoop3/jars/netty-resolver-4.1.74.Final.jar
spark-3.3.0-bin-hadoop3/jars/breeze-macros_2.12-1.2.jar
spark-3.3.0-bin-hadoop3/jars/xz-1.8.jar
spark-3.3.0-bin-hadoop3/jars/minlog-1.3.0.jar
spark-3.3.0-bin-hadoop3/jars/jersey-hk2-2.34.jar
spark-3.3.0-bin-hadoop3/jars/netty-common-4.1.74.Final.jar
spark-3.3.0-bin-hadoop3/jars/jakarta.ws.rs-api-2.1.6.jar
spark-3.3.0-bin-hadoop3/jars/spark-unsafe_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/jersey-container-servlet-core-2.34.jar
spark-3.3.0-bin-hadoop3/jars/aopalliance-repackaged-2.6.1.jar
spark-3.3.0-bin-hadoop3/jars/netty-transport-native-kqueue-4.1.74.Final-osx-
aarch_64.jar
spark-3.3.0-bin-hadoop3/jars/bonecp-0.8.0.RELEASE.jar
spark-3.3.0-bin-hadoop3/jars/jodd-core-3.5.2.jar
spark-3.3.0-bin-hadoop3/jars/orc-mapreduce-1.7.4.jar
spark-3.3.0-bin-hadoop3/jars/spire-util_2.12-0.17.0.jar
spark-3.3.0-bin-hadoop3/jars/protobuf-java-2.5.0.jar
spark-3.3.0-bin-hadoop3/jars/jersey-client-2.34.jar
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spark-3.3.0-bin-hadoop3/jars/datanucleus-core-4.1.17.jar
spark-3.3.0-bin-hadoop3/jars/janino-3.0.16.jar
spark-3.3.0-bin-hadoop3/jars/spire-platform_2.12-0.17.0.jar
spark-3.3.0-bin-hadoop3/jars/javolution-5.5.1.jar
spark-3.3.0-bin-hadoop3/jars/transaction-api-1.1.jar
spark-3.3.0-bin-hadoop3/jars/mesos-1.4.3-shaded-protobuf.jar
spark-3.3.0-bin-hadoop3/jars/curator-framework-2.13.0.jar
spark-3.3.0-bin-hadoop3/jars/parquet-encoding-1.12.2.jar
spark-3.3.0-bin-hadoop3/jars/jakarta.inject-2.6.1.jar
spark-3.3.0-bin-hadoop3/jars/hive-llap-common-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/commons-cli-1.5.0.jar
spark-3.3.0-bin-hadoop3/jars/jakarta.xml.bind-api-2.3.2.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-flowcontrol-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/algebra_2.12-2.0.1.jar
spark-3.3.0-bin-hadoop3/jars/hadoop-shaded-guava-1.1.1.jar
spark-3.3.0-bin-hadoop3/jars/arpack_combined_all-0.1.jar
spark-3.3.0-bin-hadoop3/jars/hive-vector-code-gen-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-admissionregistration-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/spark-mesos_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/jars/json4s-ast_2.12-3.7.0-M11.jar
spark-3.3.0-bin-hadoop3/jars/log4j-slf4j-impl-2.17.2.jar
spark-3.3.0-bin-hadoop3/jars/javassist-3.25.0-GA.jar
spark-3.3.0-bin-hadoop3/jars/scala-collection-compat_2.12-2.1.1.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-networking-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/py4j-0.10.9.5.jar
spark-3.3.0-bin-hadoop3/jars/netty-codec-4.1.74.Final.jar
spark-3.3.0-bin-hadoop3/jars/hadoop-client-runtime-3.3.2.jar
spark-3.3.0-bin-hadoop3/jars/univocity-parsers-2.9.1.jar
spark-3.3.0-bin-hadoop3/jars/hive-shims-scheduler-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-extensions-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/breeze_2.12-1.2.jar
spark-3.3.0-bin-hadoop3/jars/chill-java-0.10.0.jar
spark-3.3.0-bin-hadoop3/jars/spire-macros_2.12-0.17.0.jar
spark-3.3.0-bin-hadoop3/jars/scala-parser-combinators_2.12-1.1.2.jar
spark-3.3.0-bin-hadoop3/jars/hive-metastore-2.3.9.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-scheduling-5.12.2.jar
spark-3.3.0-bin-hadoop3/jars/kubernetes-model-batch-5.12.2.jar
spark-3.3.0-bin-hadoop3/data/
spark-3.3.0-bin-hadoop3/data/mllib/
spark-3.3.0-bin-hadoop3/data/mllib/sample_lda_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/sample_libsvm_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/sample_svm_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/sample_multiclass_classification_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/sample_linear_regression_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/sample_lda_libsvm_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/sample_fpgrowth.txt
spark-3.3.0-bin-hadoop3/data/mllib/sample_binary_classification_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/sample_isotonic_regression_libsvm_data.txt
```

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spark-3.3.0-bin-hadoop3/data/mllib/sample_movielens_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/als/
spark-3.3.0-bin-hadoop3/data/mllib/als/test.data
spark-3.3.0-bin-hadoop3/data/mllib/als/sample_movielens_ratings.txt
spark-3.3.0-bin-hadoop3/data/mllib/sample_kmeans_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/pic_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/images/
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/kittens/
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/kittens/54893.jpg
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/kittens/not-image.txt
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spark-3.3.0-bin-hadoop3/data/mllib/images/origin/kittens/29.5.a_b_EGDP022204.jpg
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/kittens/DP153539.jpg
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/license.txt
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/multi-channel/
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/multi-channel/BGRA.png
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/multi-channel/BGRA_alpha_60.png
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/multi-channel/grayscale.jpg
spark-3.3.0-bin-hadoop3/data/mllib/images/origin/multi-channel/chr30.4.184.jpg
spark-3.3.0-bin-hadoop3/data/mllib/images/license.txt
spark-3.3.0-bin-hadoop3/data/mllib/ridge-data/
spark-3.3.0-bin-hadoop3/data/mllib/ridge-data/lpsa.data
spark-3.3.0-bin-hadoop3/data/mllib/kmeans_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/streaming_kmeans_data_test.txt
spark-3.3.0-bin-hadoop3/data/mllib/pagerank_data.txt
spark-3.3.0-bin-hadoop3/data/mllib/gmm_data.txt
spark-3.3.0-bin-hadoop3/data/graphx/
spark-3.3.0-bin-hadoop3/data/graphx/users.txt
spark-3.3.0-bin-hadoop3/data/graphx/followers.txt
spark-3.3.0-bin-hadoop3/data/streaming/
spark-3.3.0-bin-hadoop3/data/streaming/AFINN-111.txt
spark-3.3.0-bin-hadoop3/R/
spark-3.3.0-bin-hadoop3/R/lib/
spark-3.3.0-bin-hadoop3/R/lib/sparkr.zip
spark-3.3.0-bin-hadoop3/R/lib/SparkR/
spark-3.3.0-bin-hadoop3/R/lib/SparkR/tests/
spark-3.3.0-bin-hadoop3/R/lib/SparkR/tests/testthat/
spark-3.3.0-bin-hadoop3/R/lib/SparkR/tests/testthat/test_basic.R
spark-3.3.0-bin-hadoop3/R/lib/SparkR/DESCRIPTION
spark-3.3.0-bin-hadoop3/R/lib/SparkR/profile/
spark-3.3.0-bin-hadoop3/R/lib/SparkR/profile/shell.R
spark-3.3.0-bin-hadoop3/R/lib/SparkR/profile/general.R
spark-3.3.0-bin-hadoop3/R/lib/SparkR/INDEX
spark-3.3.0-bin-hadoop3/R/lib/SparkR/Meta/
spark-3.3.0-bin-hadoop3/R/lib/SparkR/Meta/features.rds
spark-3.3.0-bin-hadoop3/R/lib/SparkR/Meta/links.rds
spark-3.3.0-bin-hadoop3/R/lib/SparkR/Meta/nsInfo.rds
```

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spark-3.3.0-bin-hadoop3/R/lib/SparkR/Meta/package.rds
spark-3.3.0-bin-hadoop3/R/lib/SparkR/Meta/vignette.rds
spark-3.3.0-bin-hadoop3/R/lib/SparkR/Meta/Rd.rds
spark-3.3.0-bin-hadoop3/R/lib/SparkR/Meta/hsearch.rds
spark-3.3.0-bin-hadoop3/R/lib/SparkR/help/
spark-3.3.0-bin-hadoop3/R/lib/SparkR/help/SparkR.rdb
spark-3.3.0-bin-hadoop3/R/lib/SparkR/help/aliases.rds
spark-3.3.0-bin-hadoop3/R/lib/SparkR/help/SparkR.rdx
spark-3.3.0-bin-hadoop3/R/lib/SparkR/help/AnIndex
spark-3.3.0-bin-hadoop3/R/lib/SparkR/help/paths.rds
spark-3.3.0-bin-hadoop3/R/lib/SparkR/R/
spark-3.3.0-bin-hadoop3/R/lib/SparkR/R/SparkR.rdb
spark-3.3.0-bin-hadoop3/R/lib/SparkR/R/SparkR.rdx
spark-3.3.0-bin-hadoop3/R/lib/SparkR/R/SparkR
spark-3.3.0-bin-hadoop3/R/lib/SparkR/NAMESPACE
spark-3.3.0-bin-hadoop3/R/lib/SparkR/doc/
spark-3.3.0-bin-hadoop3/R/lib/SparkR/doc/sparkr-vignettes.Rmd
spark-3.3.0-bin-hadoop3/R/lib/SparkR/doc/index.html
spark-3.3.0-bin-hadoop3/R/lib/SparkR/doc/sparkr-vignettes.html
spark-3.3.0-bin-hadoop3/R/lib/SparkR/doc/sparkr-vignettes.R
spark-3.3.0-bin-hadoop3/R/lib/SparkR/html/
spark-3.3.0-bin-hadoop3/R/lib/SparkR/html/00Index.html
spark-3.3.0-bin-hadoop3/R/lib/SparkR/html/R.css
spark-3.3.0-bin-hadoop3/R/lib/SparkR/worker/
spark-3.3.0-bin-hadoop3/R/lib/SparkR/worker/worker.R
spark-3.3.0-bin-hadoop3/R/lib/SparkR/worker/daemon.R
spark-3.3.0-bin-hadoop3/README.md
spark-3.3.0-bin-hadoop3/RELEASE
spark-3.3.0-bin-hadoop3/yarn/
spark-3.3.0-bin-hadoop3/yarn/spark-3.3.0-yarn-shuffle.jar
spark-3.3.0-bin-hadoop3/LICENSE
spark-3.3.0-bin-hadoop3/sbin/
spark-3.3.0-bin-hadoop3/sbin/start-workers.sh
spark-3.3.0-bin-hadoop3/sbin/stop-mesos-shuffle-service.sh
spark-3.3.0-bin-hadoop3/sbin/start-master.sh
spark-3.3.0-bin-hadoop3/sbin/workers.sh
spark-3.3.0-bin-hadoop3/sbin/start-worker.sh
spark-3.3.0-bin-hadoop3/sbin/spark-config.sh
spark-3.3.0-bin-hadoop3/sbin/start-history-server.sh
spark-3.3.0-bin-hadoop3/sbin/start-slaves.sh
spark-3.3.0-bin-hadoop3/sbin/spark-daemon.sh
spark-3.3.0-bin-hadoop3/sbin/stop-worker.sh
spark-3.3.0-bin-hadoop3/sbin/stop-mesos-dispatcher.sh
spark-3.3.0-bin-hadoop3/sbin/decommission-worker.sh
spark-3.3.0-bin-hadoop3/sbin/start-mesos-shuffle-service.sh
spark-3.3.0-bin-hadoop3/sbin/decommission-slave.sh
spark-3.3.0-bin-hadoop3/sbin/slaves.sh
spark-3.3.0-bin-hadoop3/sbin/stop-history-server.sh
```

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spark-3.3.0-bin-hadoop3/sbin/start-thriftserver.sh
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spark-3.3.0-bin-hadoop3/sbin/start-all.sh
spark-3.3.0-bin-hadoop3/sbin/stop-slave.sh
spark-3.3.0-bin-hadoop3/sbin/spark-daemons.sh
spark-3.3.0-bin-hadoop3/sbin/stop-workers.sh
spark-3.3.0-bin-hadoop3/sbin/stop-slaves.sh
spark-3.3.0-bin-hadoop3/sbin/stop-all.sh
spark-3.3.0-bin-hadoop3/sbin/start-mesos-dispatcher.sh
spark-3.3.0-bin-hadoop3/sbin/stop-master.sh
spark-3.3.0-bin-hadoop3/examples/
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spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/survreg.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/glm.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/prefixSpan.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/lm_with_elastic_net.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/powerIterationClustering.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/lda.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/kstest.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/isoreg.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/ml.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/naiveBayes.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/fmRegressor.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/mlp.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/als.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/kmeans.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/svmLinear.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/fmClassifier.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/logit.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/randomForest.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/gbt.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/decisionTree.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/gaussianMixture.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/bisectingKmeans.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/ml/fpm.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/dataframe.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/RSparkSQLExample.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/data-manipulation.R
spark-3.3.0-bin-hadoop3/examples/src/main/r/streaming/
spark-3.3.0-bin-
hadoop3/examples/src/main/r/streaming/structured_network_wordcount.R
spark-3.3.0-bin-hadoop3/examples/src/main/scala/
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/
```

```
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GroupByTest.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/Accumu
latorMetricsTest.scala
spark-3.3.0-bin-
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d2VecExample.scala
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HashLSHExample.scala
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exToStringExample.scala
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relationExample.scala
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ticlassLogisticRegressionWithElasticNetExample.scala
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torSizeHintExample.scala
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VsRestExample.scala
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pWordsRemoverExample.scala
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earSVCExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Gau
```

ssianMixtureExample.scala
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ianceThresholdSelectorExample.scala
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tonicRegressionExample.scala
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elSelectionViaCrossValidationExample.scala
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imatorTransformerParamExample.scala
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isionTreeRegressionExample.scala
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elSelectionViaTrainValidationSplitExample.scala
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isticRegressionSummaryExample.scala
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tilayerPerceptronClassifierExample.scala
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rowthExample.scala
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mentwiseProductExample.scala
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eralizedLinearRegressionExample.scala
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ntVectorizerExample.scala
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MaxScalerExample.scala
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isticRegressionWithElasticNetExample.scala
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egressorExample.scala
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isionTreeClassificationExample.scala
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ynomialExpansionExample.scala
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ryTransformerExample.scala
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uterExample.scala
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enizerExample.scala
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isionTreeExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Gra
dientBoostedTreeClassifierExample.scala
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erIterationClusteringExample.scala
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TransformerExample.scala
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marizerExample.scala
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hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/TfIdfExample.scala
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SurvivalRegressionExample.scala
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ntileDiscretizerExample.scala
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HotEncoderExample.scala
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spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Int

eractionExample.scala

spark-3.3.0-bin-
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spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/RFo
rmulaExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Vec
torIndexerExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Vec
torAssemblerExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Nor
malizerExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Chi
SqSelectorExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Nai
veBayesExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Ran
domForestClassifierExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Lin
earRegressionWithElasticNetExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/ml/Rob
ustScalerExample.scala

spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/LogQuery.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/SparkR
emoteFileTest.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/Except
ionHandlingTest.scala

spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/pythonconverters/

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/python
converters/AvroConverters.scala

spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/BroadcastTest.scala

spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/SparkHdfsLR.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
Word2VecExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
GradientBoostedTreesRunner.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
RandomRDDGeneration.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
PMMLModelExportExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
BisectingKMeansExample.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
DecisionTreeRunner.scala

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
MultiLabelMetricsExample.scala
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CorrelationsExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
LBFGSExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
TFIDFExample.scala
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StandardScalerExample.scala
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LogisticRegressionWithLBFGSExample.scala
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StreamingTestExample.scala
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BinaryClassification.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
DenseKMeans.scala
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GradientBoostingClassificationExample.scala
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RankingMetricsExample.scala
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GaussianMixtureExample.scala
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MultivariateSummarizer.scala
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IsotonicRegressionExample.scala
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PCAOnSourceVectorExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
Correlations.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
HypothesisTestingExample.scala
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DecisionTreeRegressionExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
AssociationRulesExample.scala
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StreamingLogisticRegression.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/SVDExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
PrefixSpanExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
KMeansExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
SparseNaiveBayes.scala

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spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
AbstractParams.scala
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BinaryClassificationMetricsExample.scala
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SampledRDDs.scala
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FPGrowthExample.scala
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ElementwiseProductExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
RecommendationExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
TallSkinnySVD.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
HypothesisTestingKolmogorovSmirnovTestExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
GradientBoostingRegressionExample.scala
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StreamingKMeansExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
CosineSimilarity.scala
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RandomForestRegressionExample.scala
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StreamingLinearRegressionExample.scala
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StratifiedSamplingExample.scala
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DecisionTreeClassificationExample.scala
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TallSkinnyPCA.scala
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RandomForestClassificationExample.scala
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SimpleFPGrowth.scala
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LatentDirichletAllocationExample.scala
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KernelDensityEstimationExample.scala
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PowerIterationClusteringExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
SVMWithSGDExample.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/LDAExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
MovieLensALS.scala
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spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/mllib/
NormalizerExample.scala
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MulticlassMetricsExample.scala
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ChiSqSelectorExample.scala
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SummaryStatisticsExample.scala
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PCAOnRowMatrixExample.scala
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NaiveBayesExample.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/SparkTC.scala
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SubmissionTest.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/MultiB
roadcastTest.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/SparkLR.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/SparkPi.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/graphx/
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/ConnectedComponentsExample.scala
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/LiveJournalPageRank.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/graphx
/AggregateMessagesExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/graphx
/SSSPExample.scala
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/SynthBenchmark.scala
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/TriangleCountingExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/graphx
/PageRankExample.scala
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/ComprehensiveExample.scala
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hadoop3/examples/src/main/scala/org/apache/spark/examples/graphx/Analytics.scala
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hadoop3/examples/src/main/scala/org/apache/spark/examples/SparkKMeans.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/clickstream/

spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/clickstream/PageViewGenerator.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/clickstream/PageViewStream.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/DirectKafkaWordCount.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/HdfsWordCount.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/DirectKerberizedKafkaWordCount.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/RecoverableNetworkWordCount.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/NetworkWordCount.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/QueueStream.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/SqlNetworkWordCount.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/CustomReceiver.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/RawNetworkGrep.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/StatefulNetworkWordCount.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/streaming/StreamingExamples.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/LocalLR.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/LocalKMeans.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/GroupByTest.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/LocalALS.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/SimpleTypedAggregator.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/UserDefinedUntypedAggregation.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/hive/
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/hive/SparkHiveExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/RDDRelation.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/SparkSQLExample.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/SQ

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LDataSourceExample.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/streaming/
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/st
reaming/StructuredKerberizedKafkaWordCount.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/st
reaming/StructuredComplexSessionization.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/st
reaming/StructuredNetworkWordCount.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/st
reaming/StructuredNetworkWordCountWindowed.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/st
reaming/StructuredKafkaWordCount.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/st
reaming/StructuredSessionization.scala
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erDefinedTypedAggregation.scala
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erDefinedScalar.scala
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hadoop3/examples/src/main/scala/org/apache/spark/examples/sql/jdbc/
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bc/ExampleJdbcConnectionProvider.scala
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SkewedGroupByTest.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/extensions/
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ions/SparkSessionExtensionsTest.scala
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ions/SessionExtensionsWithoutLoader.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/extens
ions/SessionExtensionsWithLoader.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/extens
ions/AgeExample.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/LocalFileLR.scala
spark-3.3.0-bin-hadoop3/examples/src/main/scala/org/apache/spark/examples/MiniRe
adWriteTest.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/LocalPi.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/DFSReadWriteTest.scala
spark-3.3.0-bin-
hadoop3/examples/src/main/scala/org/apache/spark/examples/SparkALS.scala
spark-3.3.0-bin-hadoop3/examples/src/main/resources/
spark-3.3.0-bin-hadoop3/examples/src/main/resources/people.json
spark-3.3.0-bin-hadoop3/examples/src/main/resources/users.avro
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spark-3.3.0-bin-hadoop3/examples/src/main/resources/people.csv
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spark-3.3.0-bin-hadoop3/examples/src/main/resources/META-
INF/services/org.apache.spark.sql.SparkSessionExtensionsProvider
spark-3.3.0-bin-hadoop3/examples/src/main/resources/META-
INF/services/org.apache.spark.sql.jdbc.JdbcConnectionProvider
spark-3.3.0-bin-hadoop3/examples/src/main/resources/users.orc
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spark-3.3.0-bin-hadoop3/examples/src/main/resources/dir1/dir2/file2.parquet
spark-3.3.0-bin-hadoop3/examples/src/main/resources/dir1/file3.json
spark-3.3.0-bin-hadoop3/examples/src/main/resources/user.avsc
spark-3.3.0-bin-hadoop3/examples/src/main/resources/full_user.avsc
spark-3.3.0-bin-hadoop3/examples/src/main/resources/kv1.txt
spark-3.3.0-bin-hadoop3/examples/src/main/resources/people.txt
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StringIndexerExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
ChiSqSelectorExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
LabeledDocument.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
LogisticRegressionWithElasticNetExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
PolynomialExpansionExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
TfIdfExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
BucketizerExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
LogisticRegressionSummaryExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
SummarizerExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
QuantileDiscretizerExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
BinarizerExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
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OneHotEncoderExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
StandardScalerExample.java
spark-3.3.0-bin-
hadoop3/examples/src/main/java/org/apache/spark/examples/ml/JavaDCTExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
DecisionTreeRegressionExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
RandomForestClassifierExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
OneVsRestExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
GeneralizedLinearRegressionExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
GaussianMixtureExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
Word2VecExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
NormalizerExample.java
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hadoop3/examples/src/main/java/org/apache/spark/examples/ml/JavaLDAExample.java
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CountVectorizerExample.java
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MultilayerPerceptronClassifierExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
MinMaxScalerExample.java
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CorrelationExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
NGramExample.java
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ImputerExample.java
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MinHashLSHExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
VectorSizeHintExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
FMClassifierExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
FeatureHasherExample.java
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ModelSelectionViaTrainValidationSplitExample.java
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SQLTransformerExample.java
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KMeansExample.java
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VectorAssemblerExample.java
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GradientBoostedTreeRegressorExample.java
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PrefixSpanExample.java
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FMRegressorExample.java
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NaiveBayesExample.java
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MulticlassLogisticRegressionWithElasticNetExample.java
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ModelSelectionViaCrossValidationExample.java
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UnivariateFeatureSelectorExample.java
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IsotonicRegressionExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/ml/Java
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BucketedRandomProjectionLSHExample.java
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VarianceThresholdSelectorExample.java
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VectorSlicerExample.java
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TokenizerExample.java
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RFormulaExample.java
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EstimatorTransformerParamExample.java
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PowerIterationClusteringExample.java
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BisectingKMeansExample.java
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MaxAbsScalerExample.java
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DecisionTreeClassificationExample.java
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PipelineExample.java
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StopWordsRemoverExample.java
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IndexToStringExample.java
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FPGrowthExample.java
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VectorIndexerExample.java
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InteractionExample.java
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ChiSquareTestExample.java
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RobustScalerExample.java
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LinearRegressionWithElasticNetExample.java
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LinearSVCExample.java
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avaKernelDensityEstimationExample.java
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avaSummaryStatisticsExample.java
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avaDecisionTreeRegressionExample.java

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spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/mllib/JavaKMeansExample.java
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spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/mllib/JavaLogisticRegressionWithLBFGSExample.java
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spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/mllib/JavaStreamingTestExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/JavaPageRank.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/JavaLogQuery.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/streaming/
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spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/streaming/JavaCustomReceiver.java
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spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/streaming/JavaNetworkWordCount.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/streaming/JavaDirectKerberizedKafkaWordCount.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/streaming/JavaDirectKafkaWordCount.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/streaming/JavaSqlNetworkWordCount.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/streaming/JavaRecoverableNetworkWordCount.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/streaming/JavaQueueStream.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/JavaSparkPi.java
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spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/sql/JavaUserDefinedScalar.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/sql/hive/
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/sql/hive/JavaSparkHiveExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/sql/JavaUserDefinedTypedAggregation.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/sql/JavaSQLDataSourceExample.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/sql/JavaSparkSQLExample.java
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eaming/JavaStructuredKafkaWordCount.java
spark-3.3.0-bin-hadoop3/examples/src/main/java/org/apache/spark/examples/sql/str
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eaming/JavaStructuredNetworkWordCountWindowed.java
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eaming/JavaStructuredKerberizedKafkaWordCount.java
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spark-3.3.0-bin-hadoop3/examples/src/main/scripts/getGpusResources.sh
spark-3.3.0-bin-hadoop3/examples/src/main/python/
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spark-3.3.0-bin-hadoop3/examples/src/main/python/ml/chisq_selector_example.py
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hadoop3/examples/src/main/python/ml/linear_regression_with_elastic_net.py
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spark-3.3.0-bin-hadoop3/examples/src/main/python/ml/fm_regressor_example.py
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hadoop3/examples/src/main/python/ml/generalized_linear_regression_example.py
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spark-3.3.0-bin-hadoop3/examples/src/main/python/ml/stopwords_remover_example.py
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spark-3.3.0-bin-hadoop3/examples/src/main/python/ml/lda_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/ml/random_forest_regressor_example.py
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spark-3.3.0-bin-hadoop3/examples/src/main/python/ml/vector_assembler_example.py
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hadoop3/examples/src/main/python/ml/power_iteration_clustering_example.py
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on_with_elastic_net.py
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hadoop3/examples/src/main/python/ml/decision_tree_regression_example.py
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ication_example.py
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hadoop3/examples/src/main/python/mllib/streaming_linear_regression_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/sampled_rdds.py
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spark-3.3.0-bin-
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spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/k_means_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/streaming_k_means_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/word2vec_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/multi_class_metrics_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/decision_tree_classification_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/summary_statistics_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/binary_classification_metrics_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/standard_scaler_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/power_iteration_clustering_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/gaussian_mixture_model.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/regression_metrics_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/naive_bayes_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/elementwise_product_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/linear_regression_with_sgd_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/pca_rowmatrix_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/hypothesis_testing_kolmog
orov_smirnov_test_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/random_rdd_generation.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/decision_tree_regression_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/gaussian_mixture_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/recommendation_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/fpgrowth_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/ranking_metrics_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/mllib/svm_with_sgd_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/isotonic_regression_example.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/mllib/stratified_sampling_example.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/wordcount.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/status_api_demo.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/pagerank.py
```

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spark-3.3.0-bin-hadoop3/examples/src/main/python/sort.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/transitive_closure.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/avro_inputformat.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/pi.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/streaming/
spark-3.3.0-bin-hadoop3/examples/src/main/python/streaming/queue_stream.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/streaming/__init__.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/streaming/stateful_network_wordcount.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/streaming/network_wordjoinsentiments.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/streaming/sql_network_wordcount.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/streaming/network_wordcount.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/streaming/hdfs_wordcount.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/streaming/recoverable_network_wordcount.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/sql/
spark-3.3.0-bin-hadoop3/examples/src/main/python/sql/datasource.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/sql/__init__.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/sql/hive.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/sql/arrow.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/sql/streaming/
spark-3.3.0-bin-hadoop3/examples/src/main/python/sql/streaming/structured_networ
k_wordcount_windowed.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/sql/streaming/structured_network_wordcount.py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/sql/streaming/structured_sessionization.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/sql/streaming/__init__,py
spark-3.3.0-bin-
hadoop3/examples/src/main/python/sql/streaming/structured_kafka_wordcount.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/sql/basic.py
spark-3.3.0-bin-hadoop3/examples/src/main/python/parquet_inputformat.py
spark-3.3.0-bin-hadoop3/examples/jars/
spark-3.3.0-bin-hadoop3/examples/jars/spark-examples_2.12-3.3.0.jar
spark-3.3.0-bin-hadoop3/examples/jars/scopt_2.12-3.7.1.jar
spark-3.3.0-bin-hadoop3/conf/
spark-3.3.0-bin-hadoop3/conf/metrics.properties.template
spark-3.3.0-bin-hadoop3/conf/workers.template
spark-3.3.0-bin-hadoop3/conf/fairscheduler.xml.template
spark-3.3.0-bin-hadoop3/conf/spark-defaults.conf.template
spark-3.3.0-bin-hadoop3/conf/spark-env.sh.template
spark-3.3.0-bin-hadoop3/conf/log4j2.properties.template
spark-3.3.0-bin-hadoop3/bin/
spark-3.3.0-bin-hadoop3/bin/sparkR.cmd
spark-3.3.0-bin-hadoop3/bin/sparkR
spark-3.3.0-bin-hadoop3/bin/spark-submit
```

```
spark-3.3.0-bin-hadoop3/bin/pyspark2.cmd
spark-3.3.0-bin-hadoop3/bin/spark-class
spark-3.3.0-bin-hadoop3/bin/pyspark.cmd
spark-3.3.0-bin-hadoop3/bin/spark-submit2.cmd
spark-3.3.0-bin-hadoop3/bin/load-spark-env.cmd
spark-3.3.0-bin-hadoop3/bin/spark-sql
spark-3.3.0-bin-hadoop3/bin/docker-image-tool.sh
spark-3.3.0-bin-hadoop3/bin/find-spark-home.cmd
spark-3.3.0-bin-hadoop3/bin/load-spark-env.sh
spark-3.3.0-bin-hadoop3/bin/pyspark
spark-3.3.0-bin-hadoop3/bin/spark-shell.cmd
spark-3.3.0-bin-hadoop3/bin/spark-shell2.cmd
spark-3.3.0-bin-hadoop3/bin/spark-submit.cmd
spark-3.3.0-bin-hadoop3/bin/beeline.cmd
spark-3.3.0-bin-hadoop3/bin/find-spark-home
spark-3.3.0-bin-hadoop3/bin/spark-class.cmd
spark-3.3.0-bin-hadoop3/bin/sparkR2.cmd
spark-3.3.0-bin-hadoop3/bin/beeline
spark-3.3.0-bin-hadoop3/bin/spark-class2.cmd
spark-3.3.0-bin-hadoop3/bin/spark-sql.cmd
spark-3.3.0-bin-hadoop3/bin/run-example
spark-3.3.0-bin-hadoop3/bin/spark-shell
spark-3.3.0-bin-hadoop3/bin/run-example.cmd
spark-3.3.0-bin-hadoop3/bin/spark-sql2.cmd
spark-3.3.0-bin-hadoop3/python/
spark-3.3.0-bin-hadoop3/python/.gitignore
spark-3.3.0-bin-hadoop3/python/run-tests-with-coverage
spark-3.3.0-bin-hadoop3/python/mypy.ini
spark-3.3.0-bin-hadoop3/python/MANIFEST.in
spark-3.3.0-bin-hadoop3/python/README.md
spark-3.3.0-bin-hadoop3/python/test_coverage/
spark-3.3.0-bin-hadoop3/python/test_coverage/coverage_daemon.py
spark-3.3.0-bin-hadoop3/python/test_coverage/conf/
spark-3.3.0-bin-hadoop3/python/test_coverage/conf/spark-defaults.conf
spark-3.3.0-bin-hadoop3/python/test_coverage/sitecustomize.py
spark-3.3.0-bin-hadoop3/python/run-tests.py
spark-3.3.0-bin-hadoop3/python/setup.py
spark-3.3.0-bin-hadoop3/python/test_support/
spark-3.3.0-bin-hadoop3/python/test_support/userlibrary.py
spark-3.3.0-bin-hadoop3/python/test_support/hello/
spark-3.3.0-bin-hadoop3/python/test_support/hello/sub_hello/
spark-3.3.0-bin-hadoop3/python/test_support/hello/sub_hello/sub_hello.txt
spark-3.3.0-bin-hadoop3/python/test_support/hello/hello.txt
spark-3.3.0-bin-hadoop3/python/test_support/userlib-0.1.zip
spark-3.3.0-bin-hadoop3/python/test_support/SimpleHTTPServer.py
spark-3.3.0-bin-hadoop3/python/test_support/sql/
spark-3.3.0-bin-hadoop3/python/test_support/sql/people.json
spark-3.3.0-bin-hadoop3/python/test_support/sql/people_array.json
```

```
spark-3.3.0-bin-hadoop3/python/test_support/sql/people_array_utf16le.json
spark-3.3.0-bin-hadoop3/python/test_support/sql/text-test.txt
spark-3.3.0-bin-hadoop3/python/test_support/sql/ages.csv
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2015/
spark-3.3.0-bin-
hadoop3/python/test_support/sql/parquet_partitioned/year=2015/month=10/
spark-3.3.0-bin-
hadoop3/python/test_support/sql/parquet_partitioned/year=2015/month=10/day=26/
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2015/mo
nth=10/day=26/.part-r-00005.gz.parquet.crc
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2015/mo
nth=10/day=26/part-r-00005.gz.parquet
spark-3.3.0-bin-
hadoop3/python/test_support/sql/parquet_partitioned/year=2015/month=10/day=25/
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2015/mo
nth=10/day=25/.part-r-00002.gz.parquet.crc
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2015/mo
nth=10/day=25/.part-r-00004.gz.parquet.crc
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2015/mo
nth=10/day=25/part-r-00004.gz.parquet
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2015/mo
nth=10/day=25/part-r-00002.gz.parquet
spark-3.3.0-bin-
hadoop3/python/test_support/sql/parquet_partitioned/year=2015/month=9/
spark-3.3.0-bin-
hadoop3/python/test_support/sql/parquet_partitioned/year=2015/month=9/day=1/
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2015/mo
nth=9/day=1/.part-r-00007.gz.parquet.crc
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2015/mo
nth=9/day=1/part-r-00007.gz.parquet
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/_metadata
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2014/
spark-3.3.0-bin-
hadoop3/python/test_support/sql/parquet_partitioned/year=2014/month=9/
spark-3.3.0-bin-
hadoop3/python/test_support/sql/parquet_partitioned/year=2014/month=9/day=1/
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2014/mo
nth=9/day=1/.part-r-00008.gz.parquet.crc
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/year=2014/mo
nth=9/day=1/part-r-00008.gz.parquet
spark-3.3.0-bin-
hadoop3/python/test_support/sql/parquet_partitioned/_common_metadata
spark-3.3.0-bin-hadoop3/python/test_support/sql/parquet_partitioned/_SUCCESS
spark-3.3.0-bin-hadoop3/python/test_support/sql/orc_partitioned/
spark-3.3.0-bin-hadoop3/python/test_support/sql/orc_partitioned/b=1/
spark-3.3.0-bin-hadoop3/python/test_support/sql/orc_partitioned/b=1/c=1/
spark-3.3.0-bin-hadoop3/python/test_support/sql/orc_partitioned/b=1/c=1/part-r-0
```

0000-829af031-b970-49d6-ad39-30460a0be2c8.orc
spark-3.3.0-bin-hadoop3/python/test_support/sql/orc_partitioned/b=1/c=1/.part-r-
00000-829af031-b970-49d6-ad39-30460a0be2c8.orc.crc
spark-3.3.0-bin-hadoop3/python/test_support/sql/orc_partitioned/b=0/
spark-3.3.0-bin-hadoop3/python/test_support/sql/orc_partitioned/b=0/c=0/
spark-3.3.0-bin-hadoop3/python/test_support/sql/orc_partitioned/b=0/c=0/part-r-0
0000-829af031-b970-49d6-ad39-30460a0be2c8.orc
spark-3.3.0-bin-hadoop3/python/test_support/sql/orc_partitioned/b=0/c=0/.part-r-
00000-829af031-b970-49d6-ad39-30460a0be2c8.orc.crc
spark-3.3.0-bin-hadoop3/python/test_support/sql/orc_partitioned/_SUCCESS
spark-3.3.0-bin-hadoop3/python/test_support/sql/ages_newlines.csv
spark-3.3.0-bin-hadoop3/python/test_support/sql/streaming/
spark-3.3.0-bin-hadoop3/python/test_support/sql/streaming/text-test.txt
spark-3.3.0-bin-hadoop3/python/test_support/sql/people1.json
spark-3.3.0-bin-hadoop3/python/pyspark/
spark-3.3.0-bin-hadoop3/python/pyspark/tests/
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_rddbarrier.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_worker.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_serializers.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_util.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_rdd.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_statcounter.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_broadcast.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_appsubmit.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_profiler.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_pin_thread.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_install_spark.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/typing/
spark-3.3.0-bin-hadoop3/python/pyspark/tests/typing/test_resultiterable.yml
spark-3.3.0-bin-hadoop3/python/pyspark/tests/typing/test_context.yml
spark-3.3.0-bin-hadoop3/python/pyspark/tests/typing/test_rdd.yml
spark-3.3.0-bin-hadoop3/python/pyspark/tests/typing/test_core.yml
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_shuffle.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_join.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_taskcontext.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_context.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_readwrite.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_conf.py
spark-3.3.0-bin-hadoop3/python/pyspark/tests/test_daemon.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_series.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_utils.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_dataframe.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/indexes/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/indexes/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/indexes/test_timedelta.py

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spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/indexes/test_category.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/indexes/test_datetime.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/indexes/test_base.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_window.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_indexops_spark.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_stats.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_extension.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_default_index.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_expanding.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_series_datetime.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_indexing.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_typedef.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_numpy_compat.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_dataframe_spark_io.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_repr.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_ops_on_diff_frames_groupby_expanding.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_namespace.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_ops_on_diff_frames_groupby.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_series_conversion.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_internal.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_series_string.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_groupby.py
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spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_ops_on_diff_frames_groupby_rolling.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_dataframe_conversion.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/test_categorical_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/test_complex_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/test_boolean_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/test_string_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/testing_utils.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/test_udt_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/test_num_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/test_date_ops.py
spark-3.3.0-bin-
```

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hadoop3/python/pyspark/pandas/tests/data_type_ops/test_timedelta_ops.py
spark-3.3.0-bin-
hadoop3/python/pyspark/pandas/tests/data_type_ops/test_null_ops.py
spark-3.3.0-bin-
hadoop3/python/pyspark/pandas/tests/data_type_ops/test_datetime_ops.py
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hadoop3/python/pyspark/pandas/tests/data_type_ops/test_binary_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/test_base.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_frame_spark.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_config.py
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spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/plot/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/plot/test_frame_plot.py
spark-3.3.0-bin-
hadoop3/python/pyspark/pandas/tests/plot/test_frame_plot_matplotlib.py
spark-3.3.0-bin-
hadoop3/python/pyspark/pandas/tests/plot/test_frame_plot_plotly.py
spark-3.3.0-bin-
hadoop3/python/pyspark/pandas/tests/plot/test_series_plot_matplotlib.py
spark-3.3.0-bin-
hadoop3/python/pyspark/pandas/tests/plot/test_series_plot_plotly.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/plot/test_series_plot.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_ops_on_diff_frames.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_rolling.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_reshape.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_sql.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/tests/test_spark_functions.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/sql_processor.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/numpy_compat.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/usage_logging/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/usage_logging/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/usage_logging/usage_logger.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/spark/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/spark/functions.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/spark/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/spark/accessors.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/spark/utils.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/base.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/sql_formatter.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/frame.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/window.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/indexes/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/indexes/base.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/indexes/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/indexes/timedelta.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/indexes/numeric.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/indexes/datetimes.py
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spark-3.3.0-bin-hadoop3/python/pyspark/pandas/indexes/category.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/indexes/multi.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/namespace.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/mlflow.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/indexing.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/strings.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/extensions.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/accessors.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/config.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/groupby.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/internal.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/missing/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/missing/frame.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/missing/window.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/missing/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/missing/groupby.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/missing/series.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/missing/indexes.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/missing/common.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/ml.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/series.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/_typing.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/datetimes.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/utils.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/complex_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/binary_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/base.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/categorical_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/string_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/timedelta_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/date_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/udt_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/null_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/datetime_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/num_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/data_type_ops/boolean_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/plot/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/plot/core.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/plot/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/plot/plotly.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/plot/matplotlib.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/typedef/
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/typedef/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/typedef/typehints.py
spark-3.3.0-bin-hadoop3/python/pyspark/pandas/categorical.py
```

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spark-3.3.0-bin-hadoop3/python/pyspark/pandas/generic.py
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spark-3.3.0-bin-hadoop3/python/pyspark/_typing.pyi
spark-3.3.0-bin-hadoop3/python/pyspark/testing/
spark-3.3.0-bin-hadoop3/python/pyspark/testing/mlutils.py
spark-3.3.0-bin-hadoop3/python/pyspark/testing/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/testing/mllibutils.py
spark-3.3.0-bin-hadoop3/python/pyspark/testing/pandasutils.py
spark-3.3.0-bin-hadoop3/python/pyspark/testing/utils.py
spark-3.3.0-bin-hadoop3/python/pyspark/testing/sqlutils.py
spark-3.3.0-bin-hadoop3/python/pyspark/testing/streamingutils.py
spark-3.3.0-bin-hadoop3/python/pyspark/accumulators.py
spark-3.3.0-bin-hadoop3/python/pyspark/rddsampler.py
spark-3.3.0-bin-hadoop3/python/pyspark/install.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_algorithms.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_evaluation.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_util.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_feature.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_pipeline.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_wrapper.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_tuning.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_persistence.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_param.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/typing/
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/typing/test_clustering.yaml
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/typing/test_regression.yml
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/typing/test_param.yml
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/typing/test_evaluation.yml
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/typing/test_classification.yml
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/typing/test_readable.yml
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/typing/test_feature.yml
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_training_summary.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_linalg.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_image.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_stat.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tests/test_base.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/_typing.pyi
spark-3.3.0-bin-hadoop3/python/pyspark/ml/functions.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tuning.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/pipeline.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/base.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/feature.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/stat.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/image.py
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spark-3.3.0-bin-hadoop3/python/pyspark/ml/classification.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/recommendation.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/regression.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/param/
spark-3.3.0-bin-hadoop3/python/pyspark/ml/param/_shared_params_code_gen.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/param/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/param/shared.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/tree.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/fpm.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/wrapper.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/clustering.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/common.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/linalg/
spark-3.3.0-bin-hadoop3/python/pyspark/ml/linalg/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/evaluation.py
spark-3.3.0-bin-hadoop3/python/pyspark/ml/util.py
spark-3.3.0-bin-hadoop3/python/pyspark/find_spark_home.py
spark-3.3.0-bin-hadoop3/python/pyspark/serializers.py
spark-3.3.0-bin-hadoop3/python/pyspark/java_gateway.py
spark-3.3.0-bin-hadoop3/python/pyspark/traceback_utils.py
spark-3.3.0-bin-hadoop3/python/pyspark/resource/
spark-3.3.0-bin-hadoop3/python/pyspark/resource/tests/
spark-3.3.0-bin-hadoop3/python/pyspark/resource/tests/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/resource/tests/test_resources.py
spark-3.3.0-bin-hadoop3/python/pyspark/resource/profile.py
spark-3.3.0-bin-hadoop3/python/pyspark/resource/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/resource/information.py
spark-3.3.0-bin-hadoop3/python/pyspark/resource/requests.py
spark-3.3.0-bin-hadoop3/python/pyspark/conf.py
spark-3.3.0-bin-hadoop3/python/pyspark/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/__pycache__/
spark-3.3.0-bin-hadoop3/python/pyspark/__pycache__/install.cpython-38.pyc
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/tests/
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/tests/test_algorithms.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/tests/test_streaming_algorithms.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/tests/test_util.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/tests/test_feature.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/tests/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/tests/test_linalg.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/tests/test_stat.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/_typing.pyi
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/recommendation.pyi
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/feature.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/classification.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/random.pyi
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/recommendation.py
```

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spark-3.3.0-bin-hadoop3/python/pyspark/mllib/regression.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/tree.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/fpm.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/random.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/stat/
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/stat/distribution.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/stat/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/stat/KernelDensity.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/stat/test.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/stat/_statistics.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/clustering.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/common.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/linalg/
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/linalg/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/linalg/distributed.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/evaluation.py
spark-3.3.0-bin-hadoop3/python/pyspark/mllib/util.py
spark-3.3.0-bin-hadoop3/python/pyspark/resultiterable.py
spark-3.3.0-bin-hadoop3/python/pyspark/profiler.py
spark-3.3.0-bin-hadoop3/python/pyspark/statcounter.py
spark-3.3.0-bin-hadoop3/python/pyspark/join.py
spark-3.3.0-bin-hadoop3/python/pyspark/daemon.py
spark-3.3.0-bin-hadoop3/python/pyspark/rdd.py
spark-3.3.0-bin-hadoop3/python/pyspark/context.py
spark-3.3.0-bin-hadoop3/python/pyspark/instrumentation_utils.py
spark-3.3.0-bin-hadoop3/python/pyspark/cloudpickle/
spark-3.3.0-bin-hadoop3/python/pyspark/cloudpickle/cloudpickle_fast.py
spark-3.3.0-bin-hadoop3/python/pyspark/cloudpickle/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/cloudpickle/compat.py
spark-3.3.0-bin-hadoop3/python/pyspark/cloudpickle/cloudpickle.py
spark-3.3.0-bin-hadoop3/python/pyspark/version.py
spark-3.3.0-bin-hadoop3/python/pyspark/py.typed
spark-3.3.0-bin-hadoop3/python/pyspark/files.py
spark-3.3.0-bin-hadoop3/python/pyspark/worker.py
spark-3.3.0-bin-hadoop3/python/pyspark/shell.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/tests/
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/tests/test_listener.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/tests/test_kinesis.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/tests/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/tests/test_dstream.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/tests/test_context.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/dstream.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/kinesis.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/listener.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/context.py
spark-3.3.0-bin-hadoop3/python/pyspark/streaming/util.py
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spark-3.3.0-bin-hadoop3/python/pyspark/status.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_functions.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_readwriter.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_utils.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_pandas_grouped_map.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_dataframe.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_pandas_map.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_udf.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_streaming.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_serde.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_pandas_udf_window.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_group.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_pandas_udf.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_pandas_cogrouped_map.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_pandas_udf_grouped_agg.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_pandas_udf_scalar.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/typing/
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/typing/test_column.yml
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/typing/test_session.yml
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/typing/test_dataframe.yml
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/typing/test_functions.yml
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/typing/test_readwriter.yml
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/typing/test_udf.yml
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_udf_profiler.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_pandas_udf_typehints_with_
future_annotations.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_catalog.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_datasources.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_pandas_udf_typehints.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_arrow_map.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_types.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_column.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_context.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_conf.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_arrow.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/tests/test_session.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/functions.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/serializers.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/typehints.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/map_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/types.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/group_ops.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/functions.pyi
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spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/utils.py
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spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/_typing/
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/_typing/__init__.pyi
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/_typing/protocols/
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/_typing/protocols/__init__.pyi
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/_typing/protocols/series.pyi
spark-3.3.0-bin-hadoop3/python/pyspark/sql/pandas/_typing/protocols/frame.pyi
spark-3.3.0-bin-hadoop3/python/pyspark/sql/_typing.pyi
spark-3.3.0-bin-hadoop3/python/pyspark/sql/functions.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/readwriter.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/catalog.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/sql_formatter.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/window.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/udf.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/conf.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/session.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/column.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/group.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/context.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/types.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/observation.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/dataframe.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/avro/
spark-3.3.0-bin-hadoop3/python/pyspark/sql/avro/functions.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/avro/__init__.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/utils.py
spark-3.3.0-bin-hadoop3/python/pyspark/sql/streaming.py
spark-3.3.0-bin-hadoop3/python/pyspark/python/
spark-3.3.0-bin-hadoop3/python/pyspark/python/pyspark/
spark-3.3.0-bin-hadoop3/python/pyspark/python/pyspark/shell.py
spark-3.3.0-bin-hadoop3/python/pyspark/shuffle.py
spark-3.3.0-bin-hadoop3/python/pyspark/taskcontext.py
spark-3.3.0-bin-hadoop3/python/pyspark/_globals.py
spark-3.3.0-bin-hadoop3/python/pyspark/broadcast.py
spark-3.3.0-bin-hadoop3/python/pyspark/util.py
spark-3.3.0-bin-hadoop3/python/pyspark/storagelevel.py
spark-3.3.0-bin-hadoop3/python/.coveragerc
spark-3.3.0-bin-hadoop3/python/docs/
spark-3.3.0-bin-hadoop3/python/docs/make2.bat
spark-3.3.0-bin-hadoop3/python/docs/source/
spark-3.3.0-bin-hadoop3/python/docs/source/reference/
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/
spark-3.3.0-bin-
hadoop3/python/docs/source/reference/pyspark.sql/configuration.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/window.rst
spark-3.3.0-bin-
```

```
hadoop3/python/docs/source/reference/pyspark.sql/spark_session.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/index.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/grouping.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/catalog.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/column.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/io.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/observation.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/reference/pyspark.sql/core_classes.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/row.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/avro.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/functions.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/dataframe.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.sql/data_types.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/index.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.ml.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.ss/
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.ss/index.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/reference/pyspark.ss/query_management.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.ss/io.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.ss/core_classes.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.pandas/
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.pandas/window.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.pandas/index.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/reference/pyspark.pandas/extensions.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.pandas/ml.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.pandas/frame.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.pandas/io.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.pandas/series.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.pandas/indexing.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/reference/pyspark.pandas/general_functions.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.pandas/groupby.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.mllib.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.streaming.rst
spark-3.3.0-bin-hadoop3/python/docs/source/reference/pyspark.resource.rst
spark-3.3.0-bin-hadoop3/python/docs/source/index.rst
spark-3.3.0-bin-hadoop3/python/docs/source/getting_started/
spark-3.3.0-bin-hadoop3/python/docs/source/getting_started/index.rst
spark-3.3.0-bin-hadoop3/python/docs/source/getting_started/quickstart_ps.ipynb
spark-3.3.0-bin-hadoop3/python/docs/source/getting_started/quickstart_df.ipynb
spark-3.3.0-bin-hadoop3/python/docs/source/getting_started/install.rst
spark-3.3.0-bin-hadoop3/python/docs/source/conf.py
spark-3.3.0-bin-hadoop3/python/docs/source/_templates/
spark-3.3.0-bin-hadoop3/python/docs/source/_templates/autosummary/
```

```
spark-3.3.0-bin-hadoop3/python/docs/source/_templates/autosummary/class.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/_templates/autosummary/class_with_docs.rst
spark-3.3.0-bin-hadoop3/python/docs/source/_static/
spark-3.3.0-bin-hadoop3/python/docs/source/_static/copybutton.js
spark-3.3.0-bin-hadoop3/python/docs/source/_static/css/
spark-3.3.0-bin-hadoop3/python/docs/source/_static/css/pyspark.css
spark-3.3.0-bin-hadoop3/python/docs/source/development/
spark-3.3.0-bin-hadoop3/python/docs/source/development/setting_ide.rst
spark-3.3.0-bin-hadoop3/python/docs/source/development/index.rst
spark-3.3.0-bin-hadoop3/python/docs/source/development/debugging.rst
spark-3.3.0-bin-hadoop3/python/docs/source/development/testing.rst
spark-3.3.0-bin-hadoop3/python/docs/source/development/contributing.rst
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/arrow_pandas.rst
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/index.rst
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/pandas_on_spark/
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/pandas_on_spark/types.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/user_guide/pandas_on_spark/best_practices.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/user_guide/pandas_on_spark/options.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/user_guide/pandas_on_spark/pandas_pyspark.rst
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/pandas_on_spark/index.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/user_guide/pandas_on_spark/typehints.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/user_guide/pandas_on_spark/transform_apply.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/user_guide/pandas_on_spark/supported_pandas_api.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/user_guide/pandas_on_spark/from_to_dbms.rst
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/pandas_on_spark/faq.rst
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/python_packaging.rst
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/sql/
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/sql/arrow_pandas.rst
spark-3.3.0-bin-hadoop3/python/docs/source/user_guide/sql/index.rst
spark-3.3.0-bin-hadoop3/python/docs/source/migration_guide/
spark-3.3.0-bin-
hadoop3/python/docs/source/migration_guide/pyspark_2.3.0_to_2.3.1_above.rst
spark-3.3.0-bin-hadoop3/python/docs/source/migration_guide/index.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/migration_guide/pyspark_2.4_to_3.0.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/migration_guide/pyspark_1.0_1.2_to_1.3.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/migration_guide/pyspark_3.2_to_3.3.rst
```

```
spark-3.3.0-bin-
hadoop3/python/docs/source/migration_guide/pyspark_2.3_to_2.4.rst
spark-3.3.0-bin-hadoop3/python/docs/source/migration_guide/koalas_to_pyspark.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/migration_guide/pyspark_1.4_to_1.5.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/migration_guide/pyspark_2.2_to_2.3.rst
spark-3.3.0-bin-
hadoop3/python/docs/source/migration_guide/pyspark_3.1_to_3.2.rst
spark-3.3.0-bin-hadoop3/python/docs/make.bat
spark-3.3.0-bin-hadoop3/python/docs/Makefile
spark-3.3.0-bin-hadoop3/python/lib/
spark-3.3.0-bin-hadoop3/python/lib/PY4J_LICENSE.txt
spark-3.3.0-bin-hadoop3/python/lib/py4j-0.10.9.5-src.zip
spark-3.3.0-bin-hadoop3/python/lib/pyspark.zip
spark-3.3.0-bin-hadoop3/python/run-tests
spark-3.3.0-bin-hadoop3/python/setup.cfg
spark-3.3.0-bin-hadoop3/python/dist/
spark-3.3.0-bin-hadoop3/python/pyspark.egg-info/
spark-3.3.0-bin-hadoop3/python/pyspark.egg-info/dependency_links.txt
spark-3.3.0-bin-hadoop3/python/pyspark.egg-info/PKG-INFO
spark-3.3.0-bin-hadoop3/python/pyspark.egg-info/top_level.txt
spark-3.3.0-bin-hadoop3/python/pyspark.egg-info/requires.txt
spark-3.3.0-bin-hadoop3/python/pyspark.egg-info/SOURCES.txt
spark-3.3.0-bin-hadoop3/licenses/
spark-3.3.0-bin-hadoop3/licenses/LICENSE-respond.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-sbt-launch-lib.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-antlr.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-dagre-d3.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-pyrolite.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-sorttable.js.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-janino.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-protobuf.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-jquery.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-scopt.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-netlib.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-d3.min.js.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-graphlib-dot.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-AnchorJS.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-datatables.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-pmml-model.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-paranamer.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-jakarta-ws-rs-api
spark-3.3.0-bin-hadoop3/licenses/LICENSE-dnsjava.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-jakarta.xml.bind-api.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-jakarta-annotation-api
spark-3.3.0-bin-hadoop3/licenses/LICENSE-CC0.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-jodd.txt
```

```
spark-3.3.0-bin-hadoop3/licenses/LICENSE-f2j.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-machinist.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-javolution.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-modernizr.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-spire.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-leveldbjni.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-join.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-zstd-jni.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-slf4j.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-arpack.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-jsp-api.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-JTransforms.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-JLargeArrays.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-bootstrap.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-reflectasm.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-javassist.html
spark-3.3.0-bin-hadoop3/licenses/LICENSE-zstd.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-json-formatter.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-matchMedia-polyfill.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-scala.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-jakarta.activation-api.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-automaton.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-javax-transaction-transaction-api.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-jaxb-runtime.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-minlog.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-mustache.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-xmlenc.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-jline.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-istack-commons-runtime.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-py4j.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-vis-timeline.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-blas.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-re2j.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-kryo.txt
spark-3.3.0-bin-hadoop3/licenses/LICENSE-cloudpickle.txt
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-
wheels/public/simple/
Requirement already satisfied: pyspark in /usr/local/lib/python3.7/dist-packages
(3.3.0)
Requirement already satisfied: py4j==0.10.9.5 in /usr/local/lib/python3.7/dist-
packages (from pyspark) (0.10.9.5)
```

```python
[2]: # set your spark folder to your system path environment.
     import os
     os.environ["JAVA_HOME"] = "/usr/lib/jvm/java-8-openjdk-amd64"
     os.environ["SPARK_HOME"] = "/content/spark-3.3.0-bin-hadoop3"
```

```python
[3]:  #Run a local spark session to test your installation:

      import findspark
      findspark.init()

      #to know the location where Spark is installed
      findspark.find()

      from pyspark.sql import SparkSession
      spark = SparkSession.builder.master("local[*]").getOrCreate()
```

```python
[4]:  from pyspark.sql import SparkSession
      from pyspark.sql import Row
      from pyspark.sql.functions import lit
      from pyspark.sql.types import StringType
```

```python
[ ]:  from google.colab import files
      files.upload()
```

```python
[5]:  !unzip '/content/Data.zip'
```

```
Archive:  /content/Data.zip
replace Data/location_temp.csv? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
  inflating: Data/location_temp.csv
replace Data/server_name.csv? [y]es, [n]o, [A]ll, [N]one, [r]ename: A
  inflating: Data/server_name.csv
  inflating: Data/utilization.csv
  inflating: Data/utlization.json
```

```python
[6]:  data_path = '/content/Data/'
```

```python
[7]:  spark = SparkSession \
          .builder \
          .appName("Spark SQL Query Dataframes") \
          .getOrCreate()
```

```python
[8]:  file_path = data_path + "/utilization.csv"
      df1 = spark.read.format("csv").option("header", "false").load(file_path)
```

```python
[9]:  df1.head()
```

```
[9]:  Row(_c0='03/05/2019 08:06:14', _c1='100', _c2='0.57', _c3='0.51', _c4='47')
```

```python
[10]:  df1.columns
```

```
[10]:  ['_c0', '_c1', '_c2', '_c3', '_c4']
```

```
[11]: df2 = df1.withColumnRenamed("_c0", "event_datetime") \
         .withColumnRenamed ("_c1", "server_id")        \
         .withColumnRenamed("_c2", "cpu_utilization")  \
         .withColumnRenamed("_c3", "free_memory")       \
         .withColumnRenamed("_c4", "session_count")
```

```
[12]: json_df2_path = data_path + "/utilization.json"
      df2.write.mode('overwrite').json(json_df2_path)
```

```
[13]: json_df2_path = data_path + "/utilization.json"
      df_util = spark.read.format("json").load(json_df2_path)
```

```
[14]: df_util.show(5)
```

```
+---------------+-----------------+-----------+---------+-------------+
|cpu_utilization|   event_datetime|free_memory|server_id|session_count|
+---------------+-----------------+-----------+---------+-------------+
|           0.57|03/05/2019 08:06:14|       0.51|      100|           47|
|           0.47|03/05/2019 08:11:14|       0.62|      100|           43|
|           0.56|03/05/2019 08:16:14|       0.57|      100|           62|
|           0.57|03/05/2019 08:21:14|       0.56|      100|           50|
|           0.35|03/05/2019 08:26:14|       0.46|      100|           43|
+---------------+-----------------+-----------+---------+-------------+
only showing top 5 rows
```

```
[15]: df_util.createOrReplaceTempView("utilization")
```

```
[16]: df_util.count()
```

```
[16]: 500000
```

```
[17]: df_util.describe().show(10)
```

```
+-------+-----------------+-----------------+------------------+------------
------+-----------------+
|summary|  cpu_utilization|   event_datetime|       free_memory|
server_id|    session_count|
+-------+-----------------+-----------------+------------------+------------
------+-----------------+
|  count|           500000|           500000|            500000|
500000|           500000|
|   mean| 0.62051773999995|             null|0.37912809999999125|
124.5|         69.59616|
| stddev|0.1587517387291305|             null|
0.1583093127837614|14.430884120552815|14.850676696352833|
|    min|             0.22|03/05/2019 08:06:14|              0.00|
100|             100|
```

```
|    max|                 1.00|04/09/2019 01:22:46|                 0.78|
149|                 99|
+-------+----------------+-------------------+------------------+-----------
------+----------------+
```

[18]: `df_util.describe('cpu_utilization','free_memory').show()`

```
+-------+----------------+------------------+
|summary|   cpu_utilization|        free_memory|
+-------+----------------+------------------+
|  count|           500000|            500000|
|   mean|  0.62051773999995|0.37912809999999125|
| stddev|0.1587517387291305|  0.1583093127837614|
|    min|             0.22|              0.00|
|    max|             1.00|              0.78|
+-------+----------------+------------------+
```

[20]: `df_util.printSchema()`

```
root
 |-- cpu_utilization: string (nullable = true)
 |-- event_datetime: string (nullable = true)
 |-- free_memory: string (nullable = true)
 |-- server_id: string (nullable = true)
 |-- session_count: string (nullable = true)
```

[30]:
```python
from pyspark.sql.functions import col
from pyspark.sql.types import FloatType,IntegerType

df2 = df_util.withColumn("cpu_utilization",col("cpu_utilization").
 →cast(FloatType())) \
    .withColumn("free_memory",col("free_memory").cast(FloatType())) \
    .withColumn("session_count",col("session_count").cast(IntegerType()))
df2.printSchema()
```

```
root
 |-- cpu_utilization: float (nullable = true)
 |-- event_datetime: string (nullable = true)
 |-- free_memory: float (nullable = true)
 |-- server_id: string (nullable = true)
 |-- session_count: integer (nullable = true)
```

[31]: `df2.stat.corr('cpu_utilization','free_memory')`

```
[31]: -0.470477156898419
```

```
[33]: df2.stat.corr('session_count','free_memory')
```

```
[33]: -0.5008320850870236
```

```
[34]: df_util.stat.freqItems(('server_id','session_count')).show()
```

```
+------------------+----------------------+
| server_id_freqItems|session_count_freqItems|
+------------------+----------------------+
|[111, 105, 149, 1…|    [90, 99, 84, 57, …|
+------------------+----------------------+
```

```
[35]: df_util_sample = df_util.sample(fraction=0.05, withReplacement=False)
      df_util_sample.count()
```

```
[35]: 24775
```

```
[36]: spark.sql('SELECT min(cpu_utilization), max(cpu_utilization),
      ↪stddev(cpu_utilization) FROM utilization').show()
```

```
+------------------+------------------+----------------------+
|min(cpu_utilization)|max(cpu_utilization)|stddev(cpu_utilization)|
+------------------+------------------+----------------------+
|              0.22|              1.00|     0.1587517387291305|
+------------------+------------------+----------------------+
```

```
[37]: spark.sql('SELECT server_id, min(cpu_utilization), max(cpu_utilization),
      ↪stddev(cpu_utilization) \
             FROM utilization \
             GROUP BY server_id').show(10)
```

```
+---------+------------------+------------------+----------------------+
|server_id|min(cpu_utilization)|max(cpu_utilization)|stddev(cpu_utilization)|
+---------+------------------+------------------+----------------------+
|      100|              0.27|              0.67|     0.1152264191787964|
|      101|              0.60|              1.00|    0.11651726263197697|
|      102|              0.56|              0.96|    0.11549678751286807|
|      103|              0.56|              0.96|     0.11617507884178278|
|      104|              0.51|              0.91|    0.11521679513850511|
|      105|              0.29|              0.69|    0.11510721467869486|
|      106|              0.22|              0.62|     0.11531539914568233|
|      107|              0.45|              0.85|     0.11597417369783877|
|      108|              0.55|              0.95|     0.11563100171171926|
|      109|              0.36|              0.76|     0.11574898623219722|
```

```
+---------+-----------------+------------------+--------------------+
```
only showing top 10 rows

[38]:
```
spark.sql('SELECT server_id, FLOOR(cpu_utilization*100/10) bucket FROM␣
      ↪utilization').show(10)
```

```
+---------+------+
|server_id|bucket|
+---------+------+
|      100|     5|
|      100|     4|
|      100|     5|
|      100|     5|
|      100|     3|
|      100|     4|
|      100|     5|
|      100|     4|
|      100|     5|
|      100|     5|
+---------+------+
```
only showing top 10 rows

[39]:
```
sql_window = "SELECT event_datetime, server_id, cpu_utilization,  \
        avg(cpu_utilization) OVER (PARTITION BY server_id) avg_server_util \
FROM  \
      utilization"
```

[40]:
```
spark.sql(sql_window).show(10)
```

```
+------------------+---------+---------------+------------------+
|    event_datetime|server_id|cpu_utilization|   avg_server_util|
+------------------+---------+---------------+------------------+
|03/05/2019 08:06:14|      100|           0.57|0.467506000000003|
|03/05/2019 08:11:14|      100|           0.47|0.467506000000003|
|03/05/2019 08:16:14|      100|           0.56|0.467506000000003|
|03/05/2019 08:21:14|      100|           0.57|0.467506000000003|
|03/05/2019 08:26:14|      100|           0.35|0.467506000000003|
|03/05/2019 08:31:14|      100|           0.41|0.467506000000003|
|03/05/2019 08:36:14|      100|           0.57|0.467506000000003|
|03/05/2019 08:41:14|      100|           0.41|0.467506000000003|
|03/05/2019 08:46:14|      100|           0.53|0.467506000000003|
|03/05/2019 08:51:14|      100|           0.51|0.467506000000003|
+------------------+---------+---------------+------------------+
```
only showing top 10 rows

```python
sql_window2 = "SELECT event_datetime, server_id, cpu_utilization,  \
        avg(cpu_utilization) OVER (PARTITION BY server_id) avg_server_util, \
        cpu_utilization - avg(cpu_utilization) OVER (PARTITION BY server_id)␣
↪delta_server_util \
        FROM utilization"

spark.sql(sql_window2).show(10)
```

```
+-----------------+---------+---------------+-----------------+--------------
-----+
|     event_datetime|server_id|cpu_utilization|  avg_server_util|
delta_server_util|
+-----------------+---------+---------------+-----------------+--------------
-----+
|03/05/2019 08:06:14|      100|           0.57|0.467506000000003|
0.10249399999999698|
|03/05/2019 08:11:14|      100|
0.47|0.467506000000003|0.002493399999996…|
|03/05/2019 08:16:14|      100|           0.56|0.467506000000003|
0.09249399999999708|
|03/05/2019 08:21:14|      100|           0.57|0.467506000000003|
0.10249399999999698|
|03/05/2019 08:26:14|      100|           0.35|0.467506000000003|
-0.117506000000003|
|03/05/2019 08:31:14|      100|           0.41|0.467506000000003|
-0.057506000000003|
|03/05/2019 08:36:14|      100|           0.57|0.467506000000003|
0.10249399999999698|
|03/05/2019 08:41:14|      100|           0.41|0.467506000000003|
-0.057506000000003|
|03/05/2019 08:46:14|      100|           0.53|0.467506000000003|
0.06249399999999705|
|03/05/2019 08:51:14|      100|
0.51|0.467506000000003|0.042493999999997034|
+-----------------+---------+---------------+-----------------+--------------
-----+
only showing top 10 rows
```

```python
sql_window3 = "SELECT event_datetime, server_id, cpu_utilization,  \
                avg(cpu_utilization) OVER (PARTITION BY server_id ORDER␣
↪BY event_datetime \
                        ROWS BETWEEN 1 PRECEDING AND 1 FOLLOWING)␣
↪avg_server_util \
            FROM  \
                utilization"
```

```
spark.sql(sql_window3).show(10)
```

```
+-----------------+---------+---------------+------------------+
|    event_datetime|server_id|cpu_utilization|   avg_server_util|
+-----------------+---------+---------------+------------------+
|03/05/2019 08:06:14|      100|           0.57|              0.52|
|03/05/2019 08:11:14|      100|           0.47| 0.5333333333333333|
|03/05/2019 08:16:14|      100|           0.56| 0.5333333333333333|
|03/05/2019 08:21:14|      100|           0.57|0.4933333333333335|
|03/05/2019 08:26:14|      100|           0.35| 0.4433333333333333|
|03/05/2019 08:31:14|      100|           0.41|0.4433333333333336|
|03/05/2019 08:36:14|      100|           0.57| 0.4633333333333333|
|03/05/2019 08:41:14|      100|           0.41| 0.5033333333333333|
|03/05/2019 08:46:14|      100|           0.53|0.4833333333333334|
|03/05/2019 08:51:14|      100|           0.51|0.4533333333333337|
+-----------------+---------+---------------+------------------+
only showing top 10 rows
```

[44]:
```python
from pyspark.ml.linalg import Vectors
from pyspark.ml.feature import VectorAssembler
from pyspark.ml.clustering import KMeans
```

[45]:
```python
vectorAssembler = VectorAssembler(inputCols=["cpu_utilization", "free_memory",
 "session_count"], outputCol="features")
```

[47]:
```python
vcluster_df = vectorAssembler.transform(df2)
```

[48]:
```python
vcluster_df.show(10)
```

```
+--------------+-----------------+----------+---------+------------+------
-------------+
|cpu_utilization|    event_datetime|free_memory|server_id|session_count|
features|
+--------------+-----------------+----------+---------+------------+------
-------------+
|          0.57|03/05/2019 08:06:14|      0.51|      100|
47|[0.56999999284744…|
|          0.47|03/05/2019 08:11:14|      0.62|      100|
43|[0.46999999880790…|
|          0.56|03/05/2019 08:16:14|      0.57|      100|
62|[0.56000000238418…|
|          0.57|03/05/2019 08:21:14|      0.56|      100|
50|[0.56999999284744…|
|          0.35|03/05/2019 08:26:14|      0.46|      100|
43|[0.34999999403953…|
|          0.41|03/05/2019 08:31:14|      0.58|      100|
```

```
48|[0.40999999642372…|
|             0.57|03/05/2019 08:36:14|       0.35|      100|
58|[0.56999999284744…|
|             0.41|03/05/2019 08:41:14|        0.4|      100|
58|[0.40999999642372…|
|             0.53|03/05/2019 08:46:14|       0.35|      100|
62|[0.52999997138977…|
|             0.51|03/05/2019 08:51:14|        0.6|      100|
45|[0.50999999046325…|
+--------------+------------------+-----------+---------+------------+------
-------------+
only showing top 10 rows
```

[49]:
```
kmeans = KMeans().setK(3)
kmeans = kmeans.setSeed(1)
```

[50]:
```
kmodel = kmeans.fit(vcluster_df)
```

[51]:
```
kmodel.clusterCenters()
```

[51]:
```
[array([ 0.62412637,  0.37576127, 69.58687365]),
 array([ 0.51720129,  0.48158347, 51.14110018]),
 array([ 0.71542187,  0.28469012, 87.5516823 ])]
```

[53]:
```
vectorAssembler = VectorAssembler(inputCols=["cpu_utilization"],␣
→outputCol="features")
df_vutil = vectorAssembler.transform(df2)
df_vutil.show(10)
```

```
+--------------+------------------+-----------+---------+------------+------
-------------+
|cpu_utilization|     event_datetime|free_memory|server_id|session_count|
features|
+--------------+------------------+-----------+---------+------------+------
-------------+
|             0.57|03/05/2019 08:06:14|       0.51|      100|
47|[0.5699999928474426]|
|             0.47|03/05/2019 08:11:14|       0.62|      100|
43|[0.4699999988079071]|
|             0.56|03/05/2019 08:16:14|       0.57|      100|
62|[0.5600000023841858]|
|             0.57|03/05/2019 08:21:14|       0.56|      100|
50|[0.5699999928474426]|
|             0.35|03/05/2019 08:26:14|       0.46|      100|
43|[0.3499999940395355]|
|             0.41|03/05/2019 08:31:14|       0.58|      100|
48|[0.4099999964237213]|
```

```
|           0.57|03/05/2019 08:36:14|         0.35|      100|
58|[0.5699999928474426]|
|           0.41|03/05/2019 08:41:14|          0.4|      100|
58|[0.4099999964237213]|
|           0.53|03/05/2019 08:46:14|         0.35|      100|
62|[0.5299999713897705]|
|           0.51|03/05/2019 08:51:14|          0.6|      100|
45|[0.5099999904632568]|
+--------------+------------------+----------+--------+------------+------
-------------+
only showing top 10 rows
```

[55]:
```python
from pyspark.ml.regression import LinearRegression
lr = LinearRegression(featuresCol="features",labelCol="session_count")
```

[56]:
```python
lrModel = lr.fit(df_vutil)
```

[57]:
```python
lrModel.coefficients
```

[57]: DenseVector([47.024])

[58]:
```python
lrModel.intercept
```

[58]: 40.416951218777534

[59]:
```python
lrModel.summary.rootMeanSquaredError
```

[59]: 12.8379902310662

[ ]: