```
# 🔹 Install Java
!apt-get install openjdk-8-jdk-headless -qq > /dev/null

# 🔹 Download Spark 3.4.1 (Hadoop 3) - confirmed working
!curl -L -o spark-3.4.1-bin-hadoop3.tgz
https://archive.apache.org/dist/spark/spark-3.4.1/spark-3.4.1-bin-
hadoop3.tgz

# 🔹 Extract Spark
!tar -xvzf spark-3.4.1-bin-hadoop3.tgz

# 🔹 Install findspark
!pip install -q findspark
```

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Current
                                 Dload  Upload   Total   Spent    Left
Speed
100  370M  100  370M    0       0  21.6M       0  0:00:17  0:00:17
--:--:-- 23.9M
spark-3.4.1-bin-hadoop3/
spark-3.4.1-bin-hadoop3/R/
spark-3.4.1-bin-hadoop3/R/lib/
spark-3.4.1-bin-hadoop3/R/lib/sparkr.zip
spark-3.4.1-bin-hadoop3/R/lib/SparkR/
spark-3.4.1-bin-hadoop3/R/lib/SparkR/html/
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spark-3.4.1-bin-hadoop3/R/lib/SparkR/INDEX
spark-3.4.1-bin-hadoop3/R/lib/SparkR/help/
spark-3.4.1-bin-hadoop3/R/lib/SparkR/help/aliases.rds
spark-3.4.1-bin-hadoop3/R/lib/SparkR/help/AnIndex
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spark-3.4.1-bin-hadoop3/R/lib/SparkR/help/paths.rds
spark-3.4.1-bin-hadoop3/R/lib/SparkR/worker/
spark-3.4.1-bin-hadoop3/R/lib/SparkR/worker/worker.R
spark-3.4.1-bin-hadoop3/R/lib/SparkR/worker/daemon.R
spark-3.4.1-bin-hadoop3/R/lib/SparkR/tests/
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spark-3.4.1-bin-hadoop3/R/lib/SparkR/tests/testthat/test_basic.R
spark-3.4.1-bin-hadoop3/R/lib/SparkR/profile/
spark-3.4.1-bin-hadoop3/R/lib/SparkR/profile/shell.R
spark-3.4.1-bin-hadoop3/R/lib/SparkR/profile/general.R
spark-3.4.1-bin-hadoop3/R/lib/SparkR/doc/
spark-3.4.1-bin-hadoop3/R/lib/SparkR/doc/index.html
spark-3.4.1-bin-hadoop3/R/lib/SparkR/doc/sparkr-vignettes.html
spark-3.4.1-bin-hadoop3/R/lib/SparkR/doc/sparkr-vignettes.Rmd
spark-3.4.1-bin-hadoop3/R/lib/SparkR/doc/sparkr-vignettes.R
spark-3.4.1-bin-hadoop3/R/lib/SparkR/R/
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spark-3.4.1-bin-hadoop3/R/lib/SparkR/Meta/nsInfo.rds
spark-3.4.1-bin-hadoop3/R/lib/SparkR/Meta/vignette.rds
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spark-3.4.1-bin-hadoop3/R/lib/SparkR/NAMESPACE
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spark-3.4.1-bin-hadoop3/sbin/stop-worker.sh
spark-3.4.1-bin-hadoop3/sbin/stop-thriftserver.sh
spark-3.4.1-bin-hadoop3/sbin/stop-slaves.sh
spark-3.4.1-bin-hadoop3/sbin/stop-slave.sh
spark-3.4.1-bin-hadoop3/sbin/stop-mesos-shuffle-service.sh
spark-3.4.1-bin-hadoop3/sbin/stop-mesos-dispatcher.sh
spark-3.4.1-bin-hadoop3/sbin/stop-master.sh
spark-3.4.1-bin-hadoop3/sbin/stop-history-server.sh
spark-3.4.1-bin-hadoop3/sbin/stop-connect-server.sh
spark-3.4.1-bin-hadoop3/sbin/stop-all.sh
spark-3.4.1-bin-hadoop3/sbin/start-workers.sh
spark-3.4.1-bin-hadoop3/sbin/start-worker.sh
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spark-3.4.1-bin-hadoop3/python/pyspark.egg-info/SOURCES.txt
spark-3.4.1-bin-hadoop3/python/pyspark.egg-info/top_level.txt
spark-3.4.1-bin-hadoop3/python/pyspark.egg-info/requires.txt
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.py
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txt
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spark-3.4.1-bin-hadoop3/python/test_coverage/conf/spark-defaults.conf
spark-3.4.1-bin-hadoop3/python/setup.cfg
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spark-3.4.1-bin-hadoop3/python/run-tests-with-coverage
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class.rst
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spark-3.4.1-bin-hadoop3/python/docs/Makefile
spark-3.4.1-bin-hadoop3/python/README.md
spark-3.4.1-bin-hadoop3/python/MANIFEST.in
spark-3.4.1-bin-hadoop3/python/.gitignore
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spark-3.4.1-bin-hadoop3/python/.coveragerc
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.yaml
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py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/tests/test_stat.py
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spark-3.4.1-bin-hadoop3/python/pyspark/ml/param/_shared_params_code_ge
n.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/model_cache.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/linalg/
spark-3.4.1-bin-hadoop3/python/pyspark/ml/linalg/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/image.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/evaluation.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/common.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/clustering.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/classification.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/base.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/_typing.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/ml/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/wrapper.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/tuning.py
spark-3.4.1-bin-hadoop3/python/pyspark/ml/tree.py
spark-3.4.1-bin-hadoop3/python/pyspark/join.py
spark-3.4.1-bin-hadoop3/python/pyspark/instrumentation_utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/find_spark_home.py
spark-3.4.1-bin-hadoop3/python/pyspark/files.py
spark-3.4.1-bin-hadoop3/python/pyspark/errors/
spark-3.4.1-bin-hadoop3/python/pyspark/errors/tests/
spark-3.4.1-bin-hadoop3/python/pyspark/errors/tests/test_errors.py
spark-3.4.1-bin-hadoop3/python/pyspark/errors/tests/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/errors/exceptions/
spark-3.4.1-bin-hadoop3/python/pyspark/errors/exceptions/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/errors/exceptions/connect.py
spark-3.4.1-bin-hadoop3/python/pyspark/errors/exceptions/captured.py
spark-3.4.1-bin-hadoop3/python/pyspark/errors/exceptions/base.py
spark-3.4.1-bin-hadoop3/python/pyspark/errors/utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/errors/error_classes.py
spark-3.4.1-bin-hadoop3/python/pyspark/errors/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/daemon.py
spark-3.4.1-bin-hadoop3/python/pyspark/cloudpickle/
spark-3.4.1-bin-hadoop3/python/pyspark/cloudpickle/compat.py
spark-3.4.1-bin-hadoop3/python/pyspark/cloudpickle/cloudpickle_fast.py
```

```
spark-3.4.1-bin-hadoop3/python/pyspark/cloudpickle/cloudpickle.py
spark-3.4.1-bin-hadoop3/python/pyspark/cloudpickle/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/_typing.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/_globals.py
spark-3.4.1-bin-hadoop3/python/pyspark/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/python/
spark-3.4.1-bin-hadoop3/python/pyspark/python/pyspark/
spark-3.4.1-bin-hadoop3/python/pyspark/python/pyspark/shell.py
spark-3.4.1-bin-hadoop3/python/pyspark/__pycache__/
spark-3.4.1-bin-hadoop3/python/pyspark/__pycache__/install.cpython-
38.pyc
spark-3.4.1-bin-hadoop3/python/pyspark/traceback_utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/
spark-3.4.1-bin-hadoop3/python/pyspark/tests/typing/
spark-3.4.1-bin-hadoop3/python/pyspark/tests/typing/test_resultiterabl
e.yml
spark-3.4.1-bin-hadoop3/python/pyspark/tests/typing/test_rdd.yml
spark-3.4.1-bin-hadoop3/python/pyspark/tests/typing/test_core.yml
spark-3.4.1-bin-hadoop3/python/pyspark/tests/typing/test_context.yml
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_worker.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_util.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_taskcontext.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_statcounter.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_stage_sched.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_shuffle.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_serializers.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_readwrite.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_rddsampler.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_rddbarrier.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_rdd.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_pin_thread.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_memory_profiler.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_join.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_daemon.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_conf.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_broadcast.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_appsubmit.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_profiler.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_install_spark.py
spark-3.4.1-bin-hadoop3/python/pyspark/tests/test_context.py
spark-3.4.1-bin-hadoop3/python/pyspark/testing/
spark-3.4.1-bin-hadoop3/python/pyspark/testing/utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/testing/streamingutils.py
spark-3.4.1-bin-hadoop3/python/pyspark/testing/sqlutils.py
spark-3.4.1-bin-hadoop3/python/pyspark/testing/pandasutils.py
spark-3.4.1-bin-hadoop3/python/pyspark/testing/mlutils.py
spark-3.4.1-bin-hadoop3/python/pyspark/testing/mllibutils.py
spark-3.4.1-bin-hadoop3/python/pyspark/testing/__init__.py
```

```
spark-3.4.1-bin-hadoop3/python/pyspark/testing/connectutils.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/util.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/tests/
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/tests/test_listener.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/tests/test_kinesis.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/tests/test_dstream.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/tests/test_context.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/tests/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/listener.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/kinesis.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/dstream.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/context.py
spark-3.4.1-bin-hadoop3/python/pyspark/streaming/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/storagelevel.py
spark-3.4.1-bin-hadoop3/python/pyspark/status.py
spark-3.4.1-bin-hadoop3/python/pyspark/statcounter.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/plot/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/plot/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/plot/test_series_plot_plotly.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/plot/test_series_plot_matplotlib.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/plot/test_series_plot.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/plot/test_frame_plot_plotly.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/plot/test_frame_plot_matplotlib.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/plot/test_frame_plot.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/indexes/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/indexes/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/indexes/test_timedelta.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/indexes/test_datetime.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/indexes/test_category.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/indexes/test_base.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/testing_utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
```

```
__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_udt_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_timedelta_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_string_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_num_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_null_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_datetime_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_date_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_complex_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_categorical_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_boolean_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_binary_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/data_type_ops/
test_base.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_window.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_typedef.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_stats.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_sql.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_spark_functio
ns.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_series_string
.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_series_dateti
me.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_series_conver
sion.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_series.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_scalars.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_rolling.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_reshape.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_resample.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_repr.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_ops_on_diff_f
rames_slow.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_ops_on_diff_f
rames_groupby_rolling.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_ops_on_diff_f
```

```
rames_groupby_expanding.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_ops_on_diff_f
rames_groupby.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_ops_on_diff_f
rames.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_numpy_compat.
py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_namespace.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_internal.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_indexops_spar
k.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_indexing.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_groupby_slow.
py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_groupby.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_generic_funct
ions.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_frame_spark.p
y
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_extension.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_expanding.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_ewm.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_default_index
.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_dataframe_spa
rk_io.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_dataframe_slo
w.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_dataframe_con
version.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_dataframe.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_csv.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_config.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/tests/test_categorical.p
y
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/spark/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/spark/utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/spark/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/spark/functions.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/spark/accessors.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/resample.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/plot/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/plot/plotly.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/plot/core.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/plot/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/plot/matplotlib.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/mlflow.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/window.py
```

```
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/series.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/scalars.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/resample.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/indexes.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/groupby.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/general_function
s.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/frame.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/common.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/missing/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/indexes/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/indexes/timedelta.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/indexes/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/indexes/numeric.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/indexes/multi.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/indexes/datetimes.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/indexes/category.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/indexes/base.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/extensions.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/exceptions.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/datetimes.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/udt_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/complex_op
s.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/__init__.p
y
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/timedelta_
ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/string_ops
.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/num_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/null_ops.p
y
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/datetime_o
ps.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/date_ops.p
y
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/categorica
l_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/boolean_op
s.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/binary_ops
.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/data_type_ops/base.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/correlation.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/categorical.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/accessors.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/__init__.py
```

```
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/window.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/usage_logging/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/usage_logging/usage_logg
er.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/usage_logging/__init__.p
y
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/typedef/
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/typedef/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/typedef/typehints.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/supported_api_gen.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/strings.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/sql_processor.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/sql_formatter.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/series.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/numpy_compat.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/namespace.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/internal.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/indexing.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/groupby.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/generic.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/frame.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/config.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/base.py
spark-3.4.1-bin-hadoop3/python/pyspark/pandas/_typing.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/util.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/tree.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/tests/
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/tests/test_util.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/tests/test_streaming_algo
rithms.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/tests/test_stat.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/tests/test_linalg.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/tests/test_feature.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/tests/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/tests/test_algorithms.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/stat/
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/stat/test.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/stat/distribution.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/stat/_statistics.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/stat/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/stat/KernelDensity.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/regression.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/recommendation.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/random.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/linalg/
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/linalg/distributed.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/linalg/__init__.py
```

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spark-3.4.1-bin-hadoop3/python/pyspark/mllib/fpm.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/feature.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/evaluation.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/common.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/classification.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/_typing.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/mllib/clustering.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/window.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/typing/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/typing/test_udf.yml
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/typing/test_session.y
ml
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/typing/test_readwrite
r.yml
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/typing/test_functions
.yml
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/typing/test_dataframe
.yml
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/typing/test_column.ym
l
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_udf_profiler.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_session.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_serde.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_readwriter.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_pandas_sqlmetric
s.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_group.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_errors.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_datasources.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_context.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_conf.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/streaming/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/streaming/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/streaming/test_stream
ing_listener.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/streaming/test_stream
ing.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/test_pandas_ud
f_typehints_with_future_annotations.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/test_pandas_ud
f_window.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/test_pandas_ud
f_typehints.py
```

```
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/test_pandas_ud
f_scalar.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/test_pandas_ud
f_grouped_agg.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/test_pandas_ud
f.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/test_pandas_ma
p.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/test_pandas_gr
ouped_map_with_state.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/test_pandas_gr
ouped_map.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/pandas/test_pandas_co
grouped_map.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_u
df.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_s
erde.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_r
eadwriter.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_p
andas_map.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_g
roup.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_f
unctions.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_e
rrors.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_d
atasources.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_c
onf.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_c
olumn.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_c
atalog.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_a
rrow_map.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_t
ypes.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_p
andas_udf.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_p
andas_grouped_map.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_p
andas_cogrouped_map.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_d
```

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ataframe.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_parity_a
rrow.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_connect_
plan.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_connect_
function.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_connect_
column.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_connect_
basic.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/connect/test_client.p
y
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_udf.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_types.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_functions.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_dataframe.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_column.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_catalog.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_arrow_python_udf
.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_arrow_map.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/tests/test_arrow.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/streaming/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/streaming/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/streaming/state.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/streaming/readwriter.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/streaming/query.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/streaming/listener.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/sql_formatter.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/protobuf/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/protobuf/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/protobuf/functions.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/functions.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/_typing/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/_typing/protocols/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/_typing/protocols/
series.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/_typing/protocols/
frame.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/_typing/protocols/
__init__.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/_typing/__init__.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/types.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/typehints.py
```

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spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/serializers.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/map_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/group_ops.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/functions.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/pandas/conversion.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/observation.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/group.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/types_pb2.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/example_plugi
ns_pb2.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/types_pb2.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/relations_pb2
.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/relations_pb2
.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/expressions_p
b2.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/expressions_p
b2.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/example_plugi
ns_pb2.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/common_pb2.py
i
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/common_pb2.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/commands_pb2.
pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/commands_pb2.
py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/catalog_pb2.p
yi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/catalog_pb2.p
y
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/base_pb2_grpc
.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/base_pb2.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/proto/base_pb2.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/conf.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/window.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/udf.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/types.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/session.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/readwriter.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/plan.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/group.py
```

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spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/functions.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/expressions.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/dataframe.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/conversion.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/column.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/client.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/catalog.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/connect/_typing.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/conf.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/avro/
spark-3.4.1-bin-hadoop3/python/pyspark/sql/avro/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/avro/functions.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/utils.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/udf.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/types.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/session.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/readwriter.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/functions.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/dataframe.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/context.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/column.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/catalog.py
spark-3.4.1-bin-hadoop3/python/pyspark/sql/_typing.pyi
spark-3.4.1-bin-hadoop3/python/pyspark/sql/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/shuffle.py
spark-3.4.1-bin-hadoop3/python/pyspark/resultiterable.py
spark-3.4.1-bin-hadoop3/python/pyspark/resource/
spark-3.4.1-bin-hadoop3/python/pyspark/resource/tests/
spark-3.4.1-bin-hadoop3/python/pyspark/resource/tests/test_resources.p
y
spark-3.4.1-bin-hadoop3/python/pyspark/resource/tests/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/resource/requests.py
spark-3.4.1-bin-hadoop3/python/pyspark/resource/profile.py
spark-3.4.1-bin-hadoop3/python/pyspark/resource/information.py
spark-3.4.1-bin-hadoop3/python/pyspark/resource/__init__.py
spark-3.4.1-bin-hadoop3/python/pyspark/rddsampler.py
spark-3.4.1-bin-hadoop3/python/pyspark/py.typed
spark-3.4.1-bin-hadoop3/python/pyspark/rdd.py
spark-3.4.1-bin-hadoop3/python/pyspark/profiler.py
spark-3.4.1-bin-hadoop3/python/pyspark/java_gateway.py
spark-3.4.1-bin-hadoop3/python/pyspark/install.py
spark-3.4.1-bin-hadoop3/python/pyspark/context.py
spark-3.4.1-bin-hadoop3/python/pyspark/conf.py
spark-3.4.1-bin-hadoop3/python/pyspark/broadcast.py
spark-3.4.1-bin-hadoop3/python/pyspark/accumulators.py
spark-3.4.1-bin-hadoop3/python/pyspark/worker.py
spark-3.4.1-bin-hadoop3/python/pyspark/version.py
spark-3.4.1-bin-hadoop3/python/pyspark/util.py
spark-3.4.1-bin-hadoop3/python/pyspark/taskcontext.py
```

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spark-3.4.1-bin-hadoop3/python/pyspark/shell.py
spark-3.4.1-bin-hadoop3/python/pyspark/serializers.py
spark-3.4.1-bin-hadoop3/python/lib/
spark-3.4.1-bin-hadoop3/python/lib/pyspark.zip
spark-3.4.1-bin-hadoop3/python/lib/py4j-0.10.9.7-src.zip
spark-3.4.1-bin-hadoop3/python/lib/PY4J_LICENSE.txt
spark-3.4.1-bin-hadoop3/bin/
spark-3.4.1-bin-hadoop3/bin/sparkR2.cmd
spark-3.4.1-bin-hadoop3/bin/sparkR.cmd
spark-3.4.1-bin-hadoop3/bin/sparkR
spark-3.4.1-bin-hadoop3/bin/spark-submit2.cmd
spark-3.4.1-bin-hadoop3/bin/spark-submit.cmd
spark-3.4.1-bin-hadoop3/bin/spark-submit
spark-3.4.1-bin-hadoop3/bin/spark-sql2.cmd
spark-3.4.1-bin-hadoop3/bin/spark-sql.cmd
spark-3.4.1-bin-hadoop3/bin/spark-sql
spark-3.4.1-bin-hadoop3/bin/spark-shell2.cmd
spark-3.4.1-bin-hadoop3/bin/spark-shell.cmd
spark-3.4.1-bin-hadoop3/bin/spark-shell
spark-3.4.1-bin-hadoop3/bin/spark-connect-shell
spark-3.4.1-bin-hadoop3/bin/spark-class2.cmd
spark-3.4.1-bin-hadoop3/bin/spark-class.cmd
spark-3.4.1-bin-hadoop3/bin/spark-class
spark-3.4.1-bin-hadoop3/bin/run-example.cmd
spark-3.4.1-bin-hadoop3/bin/run-example
spark-3.4.1-bin-hadoop3/bin/pyspark2.cmd
spark-3.4.1-bin-hadoop3/bin/pyspark.cmd
spark-3.4.1-bin-hadoop3/bin/pyspark
spark-3.4.1-bin-hadoop3/bin/load-spark-env.sh
spark-3.4.1-bin-hadoop3/bin/load-spark-env.cmd
spark-3.4.1-bin-hadoop3/bin/find-spark-home.cmd
spark-3.4.1-bin-hadoop3/bin/find-spark-home
spark-3.4.1-bin-hadoop3/bin/docker-image-tool.sh
spark-3.4.1-bin-hadoop3/bin/beeline.cmd
spark-3.4.1-bin-hadoop3/bin/beeline
spark-3.4.1-bin-hadoop3/README.md
spark-3.4.1-bin-hadoop3/conf/
spark-3.4.1-bin-hadoop3/conf/workers.template
spark-3.4.1-bin-hadoop3/conf/spark-env.sh.template
spark-3.4.1-bin-hadoop3/conf/spark-defaults.conf.template
spark-3.4.1-bin-hadoop3/conf/metrics.properties.template
spark-3.4.1-bin-hadoop3/conf/log4j2.properties.template
spark-3.4.1-bin-hadoop3/conf/fairscheduler.xml.template
spark-3.4.1-bin-hadoop3/data/
spark-3.4.1-bin-hadoop3/data/streaming/
spark-3.4.1-bin-hadoop3/data/streaming/AFINN-111.txt
spark-3.4.1-bin-hadoop3/data/mllib/
spark-3.4.1-bin-hadoop3/data/mllib/streaming_kmeans_data_test.txt
spark-3.4.1-bin-hadoop3/data/mllib/sample_svm_data.txt
```

```
spark-3.4.1-bin-hadoop3/data/mllib/sample_multiclass_classification_da
ta.txt
spark-3.4.1-bin-hadoop3/data/mllib/sample_movielens_data.txt
spark-3.4.1-bin-hadoop3/data/mllib/sample_linear_regression_data.txt
spark-3.4.1-bin-hadoop3/data/mllib/sample_libsvm_data.txt
spark-3.4.1-bin-hadoop3/data/mllib/sample_lda_libsvm_data.txt
spark-3.4.1-bin-hadoop3/data/mllib/sample_lda_data.txt
spark-3.4.1-bin-hadoop3/data/mllib/sample_kmeans_data.txt
spark-3.4.1-bin-hadoop3/data/mllib/sample_isotonic_regression_libsvm_d
ata.txt
spark-3.4.1-bin-hadoop3/data/mllib/sample_fpgrowth.txt
spark-3.4.1-bin-hadoop3/data/mllib/sample_binary_classification_data.t
xt
spark-3.4.1-bin-hadoop3/data/mllib/ridge-data/
spark-3.4.1-bin-hadoop3/data/mllib/ridge-data/lpsa.data
spark-3.4.1-bin-hadoop3/data/mllib/pic_data.txt
spark-3.4.1-bin-hadoop3/data/mllib/pagerank_data.txt
spark-3.4.1-bin-hadoop3/data/mllib/kmeans_data.txt
spark-3.4.1-bin-hadoop3/data/mllib/images/
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/multi-channel/
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/multi-channel/graysca
le.jpg
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/multi-channel/chr30.4
.184.jpg
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/multi-channel/BGRA_al
pha_60.png
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/multi-channel/BGRA.pn
g
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/license.txt
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/kittens/
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/kittens/not-image.txt
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/kittens/DP802813.jpg
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/kittens/DP153539.jpg
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/kittens/54893.jpg
spark-3.4.1-bin-hadoop3/data/mllib/images/origin/kittens/29.5.a_b_EGDP
022204.jpg
spark-3.4.1-bin-hadoop3/data/mllib/images/license.txt
spark-3.4.1-bin-hadoop3/data/mllib/gmm_data.txt
spark-3.4.1-bin-hadoop3/data/mllib/als/
spark-3.4.1-bin-hadoop3/data/mllib/als/test.data
spark-3.4.1-bin-hadoop3/data/mllib/als/sample_movielens_ratings.txt
spark-3.4.1-bin-hadoop3/data/graphx/
spark-3.4.1-bin-hadoop3/data/graphx/users.txt
spark-3.4.1-bin-hadoop3/data/graphx/followers.txt
spark-3.4.1-bin-hadoop3/NOTICE
spark-3.4.1-bin-hadoop3/licenses/
spark-3.4.1-bin-hadoop3/licenses/LICENSE-zstd.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-zstd-jni.txt
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spark-3.4.1-bin-hadoop3/licenses/LICENSE-xmlenc.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-vis-timeline.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-spire.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-sorttable.js.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-slf4j.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-scopt.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-sbt-launch-lib.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-respond.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-reflectasm.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-re2j.txt
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spark-3.4.1-bin-hadoop3/licenses/LICENSE-protobuf.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-pmml-model.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-paranamer.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-mustache.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-modernizr.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-minlog.txt
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transaction-api.txt
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spark-3.4.1-bin-hadoop3/licenses/LICENSE-janino.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-jakarta.xml.bind-api.txt
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spark-3.4.1-bin-hadoop3/licenses/LICENSE-jakarta-annotation-api
spark-3.4.1-bin-hadoop3/licenses/LICENSE-istack-commons-runtime.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-graphlib-dot.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-f2j.txt
spark-3.4.1-bin-hadoop3/licenses/LICENSE-dnsjava.txt
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spark-3.4.1-bin-hadoop3/licenses/LICENSE-cloudpickle.txt
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spark-3.4.1-bin-hadoop3/licenses/LICENSE-blas.txt
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spark-3.4.1-bin-hadoop3/licenses/LICENSE-AnchorJS.txt
spark-3.4.1-bin-hadoop3/LICENSE
spark-3.4.1-bin-hadoop3/examples/
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spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/
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spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/GroupByTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ExceptionHandlingTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/DriverSubmissionTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/DFSReadWriteTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/BroadcastTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/AccumulatorMetricsTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/clickstream/
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/clickstream/PageViewStream.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/clickstream/PageViewGenerator.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/StreamingExamples.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/StatefulNetworkWordCount.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/SqlNetworkWordCount.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/RecoverableNetworkWordCount.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/RawNetworkGrep.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/QueueStream.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/NetworkWordCount.scala
```

```
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/HdfsWordCount.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/DirectKerberizedKafkaWordCount.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/DirectKafkaWordCount.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/streaming/CustomReceiver.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/streaming/
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/streaming/StructuredSessionization.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/streaming/StructuredNetworkWordCountWindowed.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/streaming/StructuredNetworkWordCount.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/streaming/StructuredKerberizedKafkaWordCount.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/streaming/StructuredKafkaWordCount.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/streaming/StructuredComplexSessionization.scala
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les/sql/jdbc/ExampleJdbcConnectionProvider.scala
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les/sql/hive/
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/hive/SparkHiveExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/UserDefinedUntypedAggregation.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/UserDefinedTypedAggregation.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/UserDefinedScalar.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/SparkSQLExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/SimpleTypedAggregator.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/SQLDataSourceExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/sql/RDDRelation.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/pythonconverters/
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
```

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les/pythonconverters/AvroConverters.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/SparseNaiveBayes.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/SimpleFPGrowth.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/SampledRDDs.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/SVMWithSGDExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/SVDExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/RecommendationExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/RankingMetricsExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/RandomRDDGeneration.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/RandomForestRegressionExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/RandomForestClassificationExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/PrefixSpanExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/PowerIterationClusteringExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/PMMLModelExportExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/PCAOnSourceVectorExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/PCAOnRowMatrixExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/NormalizerExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/NaiveBayesExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/MultivariateSummarizer.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/MulticlassMetricsExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/MultiLabelMetricsExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/MovieLensALS.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/LogisticRegressionWithLBFGSExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/LatentDirichletAllocationExample.scala
```

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spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/LDAExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/LBFGSExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/KernelDensityEstimationExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/KMeansExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/IsotonicRegressionExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/HypothesisTestingKolmogorovSmirnovTestExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/HypothesisTestingExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/GradientBoostingRegressionExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/GradientBoostingClassificationExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/GradientBoostedTreesRunner.scala
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les/mllib/ElementwiseProductExample.scala
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les/mllib/DenseKMeans.scala
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les/mllib/DecisionTreeRunner.scala
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les/mllib/DecisionTreeRegressionExample.scala
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les/mllib/DecisionTreeClassificationExample.scala
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les/mllib/CosineSimilarity.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
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les/mllib/Correlations.scala
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les/mllib/BisectingKMeansExample.scala
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les/mllib/BinaryClassificationMetricsExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/mllib/BinaryClassification.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
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```
les/mllib/AssociationRulesExample.scala
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les/mllib/TallSkinnyPCA.scala
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les/mllib/StreamingTestExample.scala
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les/ml/VectorSizeHintExample.scala
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les/ml/VectorIndexerExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/VectorAssemblerExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/VarianceThresholdSelectorExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/UnivariateFeatureSelectorExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/UnaryTransformerExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/TokenizerExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/TfIdfExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/SummarizerExample.scala
```

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les/ml/StopWordsRemoverExample.scala
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les/ml/StandardScalerExample.scala
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les/ml/RandomForestRegressorExample.scala
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les/ml/RandomForestExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/RandomForestClassifierExample.scala
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les/ml/RFormulaExample.scala
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les/ml/PolynomialExpansionExample.scala
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les/ml/PipelineExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/PCAExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/OneVsRestExample.scala
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les/ml/OneHotEncoderExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
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spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
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spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/MultilayerPerceptronClassifierExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/MulticlassLogisticRegressionWithElasticNetExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/ModelSelectionViaTrainValidationSplitExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/ModelSelectionViaCrossValidationExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
```

```
les/ml/MinMaxScalerExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/MinHashLSHExample.scala
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les/ml/MaxAbsScalerExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/LogisticRegressionWithElasticNetExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/LogisticRegressionSummaryExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/LogisticRegressionExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/LinearSVCExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/LinearRegressionWithElasticNetExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/LinearRegressionExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/LDAExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/KMeansExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/IsotonicRegressionExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/InteractionExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/IndexToStringExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/ImputerExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/GradientBoostedTreeRegressorExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/GradientBoostedTreeClassifierExample.scala
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les/ml/GeneralizedLinearRegressionExample.scala
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les/ml/GaussianMixtureExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/GBTExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/FeatureHasherExample.scala
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les/ml/FPGrowthExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/FMRegressorExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/FMClassifierExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/EstimatorTransformerParamExample.scala
```

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spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/ElementwiseProductExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
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les/ml/DecisionTreeRegressionExample.scala
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les/ml/DecisionTreeExample.scala
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les/ml/DecisionTreeClassificationExample.scala
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les/ml/DataFrameExample.scala
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les/ml/DCTExample.scala
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les/ml/CountVectorizerExample.scala
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les/ml/CorrelationExample.scala
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les/ml/ChiSqSelectorExample.scala
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les/ml/BucketizerExample.scala
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les/ml/BucketedRandomProjectionLSHExample.scala
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les/ml/BisectingKMeansExample.scala
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les/ml/BinarizerExample.scala
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spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/ml/AFTSurvivalRegressionExample.scala
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spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/graphx/TriangleCountingExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/graphx/SynthBenchmark.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/graphx/SSSPExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/graphx/PageRankExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/graphx/LiveJournalPageRank.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/graphx/ConnectedComponentsExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
```

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les/graphx/ComprehensiveExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/graphx/Analytics.scala
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les/graphx/AggregateMessagesExample.scala
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les/extensions/SparkSessionExtensionsTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/extensions/SessionExtensionsWithoutLoader.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/extensions/SessionExtensionsWithLoader.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/extensions/AgeExample.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/SparkTC.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/SparkRemoteFileTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/SparkPi.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/SparkPageRank.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/SparkLR.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/SparkKMeans.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/SparkHdfsLR.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/SparkALS.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/SkewedGroupByTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/SimpleSkewedGroupByTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/MultiBroadcastTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/MiniReadWriteTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/LogQuery.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/LocalPi.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/LocalLR.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/LocalKMeans.scala
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/LocalFileLR.scala
```

```
spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
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spark-3.4.1-bin-hadoop3/examples/src/main/scala/org/apache/spark/examp
les/HdfsTest.scala
spark-3.4.1-bin-hadoop3/examples/src/main/resources/
spark-3.4.1-bin-hadoop3/examples/src/main/resources/users.parquet
spark-3.4.1-bin-hadoop3/examples/src/main/resources/users.orc
spark-3.4.1-bin-hadoop3/examples/src/main/resources/users.avro
spark-3.4.1-bin-hadoop3/examples/src/main/resources/user.avsc
spark-3.4.1-bin-hadoop3/examples/src/main/resources/people.txt
spark-3.4.1-bin-hadoop3/examples/src/main/resources/people.json
spark-3.4.1-bin-hadoop3/examples/src/main/resources/people.csv
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spark-3.4.1-bin-hadoop3/examples/src/main/resources/full_user.avsc
spark-3.4.1-bin-hadoop3/examples/src/main/resources/employees.json
spark-3.4.1-bin-hadoop3/examples/src/main/resources/dir1/
spark-3.4.1-bin-hadoop3/examples/src/main/resources/dir1/file3.json
spark-3.4.1-bin-hadoop3/examples/src/main/resources/dir1/file1.parquet
spark-3.4.1-bin-hadoop3/examples/src/main/resources/dir1/dir2/
spark-3.4.1-bin-hadoop3/examples/src/main/resources/dir1/dir2/file2.pa
rquet
spark-3.4.1-bin-hadoop3/examples/src/main/resources/META-INF/
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spark-3.4.1-bin-hadoop3/examples/src/main/resources/META-INF/services/
org.apache.spark.sql.jdbc.JdbcConnectionProvider
spark-3.4.1-bin-hadoop3/examples/src/main/resources/META-INF/services/
org.apache.spark.sql.SparkSessionExtensionsProvider
spark-3.4.1-bin-hadoop3/examples/src/main/r/
spark-3.4.1-bin-hadoop3/examples/src/main/r/streaming/
spark-3.4.1-bin-hadoop3/examples/src/main/r/streaming/structured_netwo
rk_wordcount.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/svmLinear.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/survreg.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/randomForest.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/prefixSpan.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/powerIterationClusterin
g.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/naiveBayes.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/mlp.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/ml.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/logit.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/lm_with_elastic_net.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/lda.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/kstest.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/kmeans.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/isoreg.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/glm.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/gbt.R
```

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spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/gaussianMixture.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/fpm.R
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spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/fmClassifier.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/decisionTree.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/bisectingKmeans.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/ml/als.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/dataframe.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/data-manipulation.R
spark-3.4.1-bin-hadoop3/examples/src/main/r/RSparkSQLExample.R
spark-3.4.1-bin-hadoop3/examples/src/main/python/
spark-3.4.1-bin-hadoop3/examples/src/main/python/wordcount.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/transitive_closure.py
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spark-3.4.1-bin-hadoop3/examples/src/main/python/streaming/stateful_ne
twork_wordcount.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/streaming/sql_network
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_network_wordcount.py
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m.py
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djoinsentiments.py
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dcount.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/streaming/hdfs_wordco
unt.py
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spark-3.4.1-bin-hadoop3/examples/src/main/python/status_api_demo.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/sql/
spark-3.4.1-bin-hadoop3/examples/src/main/python/sql/streaming/
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red_sessionization.py
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red_network_wordcount_windowed.py
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red_network_wordcount_session_window.py
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red_network_wordcount.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/sql/streaming/structu
red_kafka_wordcount.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/sql/streaming/__init_
_,py
spark-3.4.1-bin-hadoop3/examples/src/main/python/sql/hive.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/sql/datasource.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/sql/basic.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/sql/arrow.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/sql/__init__.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/sort.py
```

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spark-3.4.1-bin-hadoop3/examples/src/main/python/pi.py
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spark-3.4.1-bin-hadoop3/examples/src/main/python/mllib/word2vec_exampl
e.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/mllib/word2vec.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/mllib/tf_idf_example.
py
spark-3.4.1-bin-hadoop3/examples/src/main/python/mllib/svm_with_sgd_ex
ample.py
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r_regression_example.py
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ns_example.py
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ics_example.py
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ration.py
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egression_example.py
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lassification_example.py
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_clustering_example.py
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xample.py
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ple.py
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rics_example.py
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rics_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/mllib/logistic_regres
```

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sion_with_lbfgs_example.py
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on_with_sgd_example.py
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t_allocation_example.py
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estimation_example.py
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.py
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sion_example.py
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ing_kolmogorov_smirnov_test_example.py
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ing_example.py
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ng_regression_example.py
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ng_classification_example.py
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e_model.py
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e_example.py
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e.py
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duct_example.py
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egression_example.py
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lassification_example.py
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ample.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/mllib/correlations.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/mllib/bisecting_k_mea
ns_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/mllib/binary_classifi
cation_metrics_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/mllib/__init__.py
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spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/word2vec_example.p
y
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/vector_slicer_exam
ple.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/vector_size_hint_e
xample.py
```

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spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/vector_indexer_exa
mple.py
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xample.py
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_selector_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/univariate_feature
_selector_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/train_validation_s
plit.py
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py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/tf_idf_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/summarizer_example
.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/string_indexer_exa
mple.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/stopwords_remover_
example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/standard_scaler_ex
ample.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/sql_transformer.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/robust_scaler_exam
ple.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/rformula_example.p
y
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/random_forest_regr
essor_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/random_forest_clas
sifier_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/quantile_discretiz
er_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/prefixspan_example
.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/power_iteration_cl
ustering_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/polynomial_expansi
on_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/pipeline_example.p
y
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/pca_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/onehot_encoder_exa
mple.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/one_vs_rest_exampl
e.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/normalizer_example
.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/naive_bayes_exampl
e.py
```

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spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/n_gram_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/multilayer_percept
ron_classification.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/multiclass_logisti
c_regression_with_elastic_net.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/min_max_scaler_exa
mple.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/min_hash_lsh_examp
le.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/max_abs_scaler_exa
mple.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/logistic_regressio
n_with_elastic_net.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/logistic_regressio
n_summary_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/linearsvc.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/linear_regression_
with_elastic_net.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/lda_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/kmeans_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/isotonic_regressio
n_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/interaction_exampl
e.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/index_to_string_ex
ample.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/imputer_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/gradient_boosted_t
ree_regressor_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/gradient_boosted_t
ree_classifier_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/generalized_linear
_regression_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/gaussian_mixture_e
xample.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/fpgrowth_example.p
y
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/fm_regressor_examp
le.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/fm_classifier_exam
ple.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/feature_hasher_exa
mple.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/estimator_transfor
mer_param_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/elementwise_produc
t_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/decision_tree_regr
ession_example.py
```

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spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/decision_tree_clas
sification_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/dct_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/dataframe_example.
py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/cross_validator.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/count_vectorizer_e
xample.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/correlation_exampl
e.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/chisq_selector_exa
mple.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/chi_square_test_ex
ample.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/bucketizer_example
.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/bucketed_random_pr
ojection_lsh_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/bisecting_k_means_
example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/binarizer_example.
py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/als_example.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/aft_survival_regre
ssion.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/ml/__init__,py
spark-3.4.1-bin-hadoop3/examples/src/main/python/logistic_regression.p
y
spark-3.4.1-bin-hadoop3/examples/src/main/python/kmeans.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/avro_inputformat.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/als.py
spark-3.4.1-bin-hadoop3/examples/src/main/python/__init__.py
spark-3.4.1-bin-hadoop3/examples/src/main/java/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/streaming/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/streaming/JavaStatefulNetworkWordCount.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/streaming/JavaSqlNetworkWordCount.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/streaming/JavaRecoverableNetworkWordCount.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/streaming/JavaRecord.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
```

```
es/streaming/JavaQueueStream.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/streaming/JavaNetworkWordCount.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/streaming/JavaDirectKerberizedKafkaWordCount.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/streaming/JavaDirectKafkaWordCount.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/streaming/JavaCustomReceiver.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/streaming/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/streaming/JavaStructuredSessionization.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/streaming/JavaStructuredNetworkWordCountWindowed.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/streaming/JavaStructuredNetworkWordCount.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/streaming/JavaStructuredKerberizedKafkaWordCount.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/streaming/JavaStructuredKafkaWordCount.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/streaming/JavaStructuredComplexSessionization.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/hive/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/hive/JavaSparkHiveExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/JavaUserDefinedUntypedAggregation.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/JavaUserDefinedTypedAggregation.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/JavaUserDefinedScalar.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/JavaSparkSQLExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/sql/JavaSQLDataSourceExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaSummaryStatisticsExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaStreamingTestExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaStratifiedSamplingExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaSimpleFPGrowth.java
```

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spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaSVMWithSGDExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaSVDExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaRecommendationExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaRankingMetricsExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaRandomForestRegressionExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaRandomForestClassificationExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaPrefixSpanExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaPowerIterationClusteringExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaPCAExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaNaiveBayesExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaMulticlassClassificationMetricsExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaMultiLabelClassificationMetricsExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaLogisticRegressionWithLBFGSExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaLatentDirichletAllocationExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaLBFGSExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaKernelDensityEstimationExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaKMeansExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaIsotonicRegressionExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaHypothesisTestingKolmogorovSmirnovTestExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaHypothesisTestingExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaGradientBoostingRegressionExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaGradientBoostingClassificationExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaGaussianMixtureExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaElementwiseProductExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
```

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es/mllib/JavaDecisionTreeRegressionExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaDecisionTreeClassificationExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaCorrelationsExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaChiSqSelectorExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaBisectingKMeansExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaBinaryClassificationMetricsExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaAssociationRulesExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/mllib/JavaALS.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaWord2VecExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaVectorSlicerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaVectorSizeHintExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaVectorIndexerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaVectorAssemblerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaVarianceThresholdSelectorExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaUnivariateFeatureSelectorExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaTokenizerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaTfIdfExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaSummarizerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaStringIndexerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaStopWordsRemoverExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaStandardScalerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaSQLTransformerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaRobustScalerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaRandomForestRegressorExample.java
```

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spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaRandomForestClassifierExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaRFormulaExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaQuantileDiscretizerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaPrefixSpanExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaPowerIterationClusteringExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaPolynomialExpansionExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaPipelineExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaPCAExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaOneVsRestExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaOneHotEncoderExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaNormalizerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaNaiveBayesExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaNGramExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaMultilayerPerceptronClassifierExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaMulticlassLogisticRegressionWithElasticNetExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaModelSelectionViaTrainValidationSplitExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaModelSelectionViaCrossValidationExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaMinMaxScalerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaMinHashLSHExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaMaxAbsScalerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaLogisticRegressionWithElasticNetExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaLogisticRegressionSummaryExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaLinearSVCExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaLinearRegressionWithElasticNetExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
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es/ml/JavaLabeledDocument.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaLDAExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaKMeansExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaIsotonicRegressionExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaInteractionExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaIndexToStringExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaImputerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaGradientBoostedTreeRegressorExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaGradientBoostedTreeClassifierExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaGeneralizedLinearRegressionExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaGaussianMixtureExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaFeatureHasherExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaFPGrowthExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaFMRegressorExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaFMClassifierExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaEstimatorTransformerParamExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaElementwiseProductExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaDocument.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaDecisionTreeRegressionExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaDecisionTreeClassificationExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaDCTExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaCountVectorizerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaCorrelationExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaChiSquareTestExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaChiSqSelectorExample.java
```

```
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaBucketizerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaBucketedRandomProjectionLSHExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaBisectingKMeansExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaBinarizerExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaALSExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/ml/JavaAFTSurvivalRegressionExample.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/JavaWordCount.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/JavaTC.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/JavaStatusTrackerDemo.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/JavaSparkPi.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/JavaPageRank.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/JavaLogQuery.java
spark-3.4.1-bin-hadoop3/examples/src/main/java/org/apache/spark/exampl
es/JavaHdfsLR.java
spark-3.4.1-bin-hadoop3/examples/src/main/scripts/
spark-3.4.1-bin-hadoop3/examples/src/main/scripts/getGpusResources.sh
spark-3.4.1-bin-hadoop3/examples/jars/
spark-3.4.1-bin-hadoop3/examples/jars/spark-examples_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/examples/jars/scopt_2.12-3.7.1.jar
spark-3.4.1-bin-hadoop3/kubernetes/
spark-3.4.1-bin-hadoop3/kubernetes/tests/
spark-3.4.1-bin-hadoop3/kubernetes/tests/worker_memory_check.py
spark-3.4.1-bin-hadoop3/kubernetes/tests/python_executable_check.py
spark-3.4.1-bin-hadoop3/kubernetes/tests/pyfiles.py
spark-3.4.1-bin-hadoop3/kubernetes/tests/py_container_checks.py
spark-3.4.1-bin-hadoop3/kubernetes/tests/decommissioning_cleanup.py
spark-3.4.1-bin-hadoop3/kubernetes/tests/decommissioning.py
spark-3.4.1-bin-hadoop3/kubernetes/tests/autoscale.py
spark-3.4.1-bin-hadoop3/kubernetes/dockerfiles/
spark-3.4.1-bin-hadoop3/kubernetes/dockerfiles/spark/
spark-3.4.1-bin-hadoop3/kubernetes/dockerfiles/spark/entrypoint.sh
spark-3.4.1-bin-hadoop3/kubernetes/dockerfiles/spark/decom.sh
spark-3.4.1-bin-hadoop3/kubernetes/dockerfiles/spark/bindings/
spark-3.4.1-bin-hadoop3/kubernetes/dockerfiles/spark/bindings/python/
spark-3.4.1-bin-hadoop3/kubernetes/dockerfiles/spark/bindings/python/
Dockerfile
spark-3.4.1-bin-hadoop3/kubernetes/dockerfiles/spark/bindings/R/
spark-3.4.1-bin-hadoop3/kubernetes/dockerfiles/spark/bindings/R/Docker
```

```
file
spark-3.4.1-bin-hadoop3/kubernetes/dockerfiles/spark/Dockerfile
spark-3.4.1-bin-hadoop3/yarn/
spark-3.4.1-bin-hadoop3/yarn/spark-3.4.1-yarn-shuffle.jar
spark-3.4.1-bin-hadoop3/jars/
spark-3.4.1-bin-hadoop3/jars/rocksdbjni-7.9.2.jar
spark-3.4.1-bin-hadoop3/jars/py4j-0.10.9.7.jar
spark-3.4.1-bin-hadoop3/jars/protobuf-java-2.5.0.jar
spark-3.4.1-bin-hadoop3/jars/pickle-1.3.jar
spark-3.4.1-bin-hadoop3/jars/parquet-jackson-1.12.3.jar
spark-3.4.1-bin-hadoop3/jars/parquet-hadoop-1.12.3.jar
spark-3.4.1-bin-hadoop3/jars/parquet-format-structures-1.12.3.jar
spark-3.4.1-bin-hadoop3/jars/parquet-encoding-1.12.3.jar
spark-3.4.1-bin-hadoop3/jars/parquet-common-1.12.3.jar
spark-3.4.1-bin-hadoop3/jars/parquet-column-1.12.3.jar
spark-3.4.1-bin-hadoop3/jars/paranamer-2.8.jar
spark-3.4.1-bin-hadoop3/jars/osgi-resource-locator-1.0.3.jar
spark-3.4.1-bin-hadoop3/jars/oro-2.0.8.jar
spark-3.4.1-bin-hadoop3/jars/orc-shims-1.8.4.jar
spark-3.4.1-bin-hadoop3/jars/orc-mapreduce-1.8.4-shaded-protobuf.jar
spark-3.4.1-bin-hadoop3/jars/orc-core-1.8.4-shaded-protobuf.jar
spark-3.4.1-bin-hadoop3/jars/opencsv-2.3.jar
spark-3.4.1-bin-hadoop3/jars/okio-1.15.0.jar
spark-3.4.1-bin-hadoop3/jars/okhttp-3.12.12.jar
spark-3.4.1-bin-hadoop3/jars/objenesis-3.2.jar
spark-3.4.1-bin-hadoop3/jars/netty-transport-native-unix-common-
4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-transport-native-kqueue-
4.1.87.Final-osx-x86_64.jar
spark-3.4.1-bin-hadoop3/jars/netty-transport-native-kqueue-
4.1.87.Final-osx-aarch_64.jar
spark-3.4.1-bin-hadoop3/jars/netty-transport-native-epoll-
4.1.87.Final-linux-x86_64.jar
spark-3.4.1-bin-hadoop3/jars/netty-transport-native-epoll-
4.1.87.Final-linux-aarch_64.jar
spark-3.4.1-bin-hadoop3/jars/netty-transport-classes-kqueue-
4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-transport-classes-epoll-
4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-transport-4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-resolver-4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-handler-proxy-4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-handler-4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-common-4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-codec-socks-4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-codec-http2-4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-codec-http-4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-codec-4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/netty-buffer-4.1.87.Final.jar
```

```
spark-3.4.1-bin-hadoop3/jars/netty-all-4.1.87.Final.jar
spark-3.4.1-bin-hadoop3/jars/minlog-1.3.0.jar
spark-3.4.1-bin-hadoop3/jars/metrics-jvm-4.2.15.jar
spark-3.4.1-bin-hadoop3/jars/metrics-json-4.2.15.jar
spark-3.4.1-bin-hadoop3/jars/metrics-jmx-4.2.15.jar
spark-3.4.1-bin-hadoop3/jars/metrics-graphite-4.2.15.jar
spark-3.4.1-bin-hadoop3/jars/metrics-core-4.2.15.jar
spark-3.4.1-bin-hadoop3/jars/mesos-1.4.3-shaded-protobuf.jar
spark-3.4.1-bin-hadoop3/jars/lz4-java-1.8.0.jar
spark-3.4.1-bin-hadoop3/jars/logging-interceptor-3.12.12.jar
spark-3.4.1-bin-hadoop3/jars/log4j-slf4j2-impl-2.19.0.jar
spark-3.4.1-bin-hadoop3/jars/log4j-core-2.19.0.jar
spark-3.4.1-bin-hadoop3/jars/log4j-api-2.19.0.jar
spark-3.4.1-bin-hadoop3/jars/log4j-1.2-api-2.19.0.jar
spark-3.4.1-bin-hadoop3/jars/libthrift-0.12.0.jar
spark-3.4.1-bin-hadoop3/jars/libfb303-0.9.3.jar
spark-3.4.1-bin-hadoop3/jars/leveldbjni-all-1.8.jar
spark-3.4.1-bin-hadoop3/jars/lapack-3.0.3.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-storageclass-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-scheduling-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-rbac-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-policy-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-node-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-networking-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-metrics-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-gatewayapi-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-flowcontrol-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-extensions-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-events-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-discovery-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-core-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-coordination-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-common-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-certificates-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-batch-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-autoscaling-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-apps-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-apiextensions-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-model-admissionregistration-
6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-httpclient-okhttp-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-client-api-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kubernetes-client-6.4.1.jar
spark-3.4.1-bin-hadoop3/jars/kryo-shaded-4.0.2.jar
spark-3.4.1-bin-hadoop3/jars/jul-to-slf4j-2.0.6.jar
spark-3.4.1-bin-hadoop3/jars/jta-1.1.jar
spark-3.4.1-bin-hadoop3/jars/jsr305-3.0.0.jar
spark-3.4.1-bin-hadoop3/jars/json4s-scalap_2.12-3.7.0-M11.jar
spark-3.4.1-bin-hadoop3/jars/json4s-jackson_2.12-3.7.0-M11.jar
```

```
spark-3.4.1-bin-hadoop3/jars/json4s-core_2.12-3.7.0-M11.jar
spark-3.4.1-bin-hadoop3/jars/json4s-ast_2.12-3.7.0-M11.jar
spark-3.4.1-bin-hadoop3/jars/json-1.8.jar
spark-3.4.1-bin-hadoop3/jars/jpam-1.1.jar
spark-3.4.1-bin-hadoop3/jars/jodd-core-3.5.2.jar
spark-3.4.1-bin-hadoop3/jars/joda-time-2.12.2.jar
spark-3.4.1-bin-hadoop3/jars/jline-2.14.6.jar
spark-3.4.1-bin-hadoop3/jars/jersey-server-2.36.jar
spark-3.4.1-bin-hadoop3/jars/jersey-hk2-2.36.jar
spark-3.4.1-bin-hadoop3/jars/jersey-container-servlet-core-2.36.jar
spark-3.4.1-bin-hadoop3/jars/jersey-container-servlet-2.36.jar
spark-3.4.1-bin-hadoop3/jars/jersey-common-2.36.jar
spark-3.4.1-bin-hadoop3/jars/jersey-client-2.36.jar
spark-3.4.1-bin-hadoop3/jars/jdo-api-3.0.1.jar
spark-3.4.1-bin-hadoop3/jars/jcl-over-slf4j-2.0.6.jar
spark-3.4.1-bin-hadoop3/jars/jaxb-runtime-2.3.2.jar
spark-3.4.1-bin-hadoop3/jars/javolution-5.5.1.jar
spark-3.4.1-bin-hadoop3/jars/javax.jdo-3.2.0-m3.jar
spark-3.4.1-bin-hadoop3/jars/javassist-3.25.0-GA.jar
spark-3.4.1-bin-hadoop3/jars/janino-3.1.9.jar
spark-3.4.1-bin-hadoop3/jars/jakarta.xml.bind-api-2.3.2.jar
spark-3.4.1-bin-hadoop3/jars/jakarta.ws.rs-api-2.1.6.jar
spark-3.4.1-bin-hadoop3/jars/jakarta.validation-api-2.0.2.jar
spark-3.4.1-bin-hadoop3/jars/jakarta.servlet-api-4.0.3.jar
spark-3.4.1-bin-hadoop3/jars/jakarta.inject-2.6.1.jar
spark-3.4.1-bin-hadoop3/jars/jakarta.annotation-api-1.3.5.jar
spark-3.4.1-bin-hadoop3/jars/jackson-module-scala_2.12-2.14.2.jar
spark-3.4.1-bin-hadoop3/jars/jackson-mapper-asl-1.9.13.jar
spark-3.4.1-bin-hadoop3/jars/jackson-datatype-jsr310-2.14.2.jar
spark-3.4.1-bin-hadoop3/jars/jackson-dataformat-yaml-2.14.2.jar
spark-3.4.1-bin-hadoop3/jars/jackson-databind-2.14.2.jar
spark-3.4.1-bin-hadoop3/jars/jackson-core-asl-1.9.13.jar
spark-3.4.1-bin-hadoop3/jars/jackson-core-2.14.2.jar
spark-3.4.1-bin-hadoop3/jars/jackson-annotations-2.14.2.jar
spark-3.4.1-bin-hadoop3/jars/ivy-2.5.1.jar
spark-3.4.1-bin-hadoop3/jars/istack-commons-runtime-3.0.8.jar
spark-3.4.1-bin-hadoop3/jars/httpcore-4.4.16.jar
spark-3.4.1-bin-hadoop3/jars/httpclient-4.5.14.jar
spark-3.4.1-bin-hadoop3/jars/hk2-utils-2.6.1.jar
spark-3.4.1-bin-hadoop3/jars/hk2-locator-2.6.1.jar
spark-3.4.1-bin-hadoop3/jars/hk2-api-2.6.1.jar
spark-3.4.1-bin-hadoop3/jars/hive-storage-api-2.8.1.jar
spark-3.4.1-bin-hadoop3/jars/hive-shims-scheduler-2.3.9.jar
spark-3.4.1-bin-hadoop3/jars/hive-shims-common-2.3.9.jar
spark-3.4.1-bin-hadoop3/jars/hive-shims-2.3.9.jar
spark-3.4.1-bin-hadoop3/jars/hive-shims-0.23-2.3.9.jar
spark-3.4.1-bin-hadoop3/jars/hive-service-rpc-3.1.3.jar
spark-3.4.1-bin-hadoop3/jars/hive-serde-2.3.9.jar
spark-3.4.1-bin-hadoop3/jars/hive-metastore-2.3.9.jar
```

```
spark-3.4.1-bin-hadoop3/jars/hive-llap-common-2.3.9.jar
spark-3.4.1-bin-hadoop3/jars/hive-jdbc-2.3.9.jar
spark-3.4.1-bin-hadoop3/jars/hive-exec-2.3.9-core.jar
spark-3.4.1-bin-hadoop3/jars/hive-common-2.3.9.jar
spark-3.4.1-bin-hadoop3/jars/hive-cli-2.3.9.jar
spark-3.4.1-bin-hadoop3/jars/hive-beeline-2.3.9.jar
spark-3.4.1-bin-hadoop3/jars/hadoop-yarn-server-web-proxy-3.3.4.jar
spark-3.4.1-bin-hadoop3/jars/hadoop-shaded-guava-1.1.1.jar
spark-3.4.1-bin-hadoop3/jars/hadoop-client-runtime-3.3.4.jar
spark-3.4.1-bin-hadoop3/jars/hadoop-client-api-3.3.4.jar
spark-3.4.1-bin-hadoop3/jars/guava-14.0.1.jar
spark-3.4.1-bin-hadoop3/jars/gson-2.2.4.jar
spark-3.4.1-bin-hadoop3/jars/flatbuffers-java-1.12.0.jar
spark-3.4.1-bin-hadoop3/jars/dropwizard-metrics-hadoop-metrics2-
reporter-0.1.2.jar
spark-3.4.1-bin-hadoop3/jars/derby-10.14.2.0.jar
spark-3.4.1-bin-hadoop3/jars/datanucleus-rdbms-4.1.19.jar
spark-3.4.1-bin-hadoop3/jars/datanucleus-core-4.1.17.jar
spark-3.4.1-bin-hadoop3/jars/datanucleus-api-jdo-4.2.4.jar
spark-3.4.1-bin-hadoop3/jars/curator-recipes-2.13.0.jar
spark-3.4.1-bin-hadoop3/jars/curator-framework-2.13.0.jar
spark-3.4.1-bin-hadoop3/jars/curator-client-2.13.0.jar
spark-3.4.1-bin-hadoop3/jars/compress-lzf-1.1.2.jar
spark-3.4.1-bin-hadoop3/jars/commons-text-1.10.0.jar
spark-3.4.1-bin-hadoop3/jars/commons-pool-1.5.4.jar
spark-3.4.1-bin-hadoop3/jars/commons-math3-3.6.1.jar
spark-3.4.1-bin-hadoop3/jars/commons-logging-1.1.3.jar
spark-3.4.1-bin-hadoop3/jars/commons-lang3-3.12.0.jar
spark-3.4.1-bin-hadoop3/jars/commons-lang-2.6.jar
spark-3.4.1-bin-hadoop3/jars/commons-io-2.11.0.jar
spark-3.4.1-bin-hadoop3/jars/commons-dbcp-1.4.jar
spark-3.4.1-bin-hadoop3/jars/commons-crypto-1.1.0.jar
spark-3.4.1-bin-hadoop3/jars/commons-compress-1.22.jar
spark-3.4.1-bin-hadoop3/jars/commons-compiler-3.1.9.jar
spark-3.4.1-bin-hadoop3/jars/commons-collections4-4.4.jar
spark-3.4.1-bin-hadoop3/jars/commons-collections-3.2.2.jar
spark-3.4.1-bin-hadoop3/jars/commons-codec-1.15.jar
spark-3.4.1-bin-hadoop3/jars/commons-cli-1.5.0.jar
spark-3.4.1-bin-hadoop3/jars/chill_2.12-0.10.0.jar
spark-3.4.1-bin-hadoop3/jars/chill-java-0.10.0.jar
spark-3.4.1-bin-hadoop3/jars/cats-kernel_2.12-2.1.1.jar
spark-3.4.1-bin-hadoop3/jars/breeze_2.12-2.1.0.jar
spark-3.4.1-bin-hadoop3/jars/breeze-macros_2.12-2.1.0.jar
spark-3.4.1-bin-hadoop3/jars/bonecp-0.8.0.RELEASE.jar
spark-3.4.1-bin-hadoop3/jars/blas-3.0.3.jar
spark-3.4.1-bin-hadoop3/jars/avro-mapred-1.11.1.jar
spark-3.4.1-bin-hadoop3/jars/avro-ipc-1.11.1.jar
spark-3.4.1-bin-hadoop3/jars/avro-1.11.1.jar
spark-3.4.1-bin-hadoop3/jars/audience-annotations-0.5.0.jar
```

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spark-3.4.1-bin-hadoop3/jars/arrow-vector-11.0.0.jar
spark-3.4.1-bin-hadoop3/jars/arrow-memory-netty-11.0.0.jar
spark-3.4.1-bin-hadoop3/jars/arrow-memory-core-11.0.0.jar
spark-3.4.1-bin-hadoop3/jars/arrow-format-11.0.0.jar
spark-3.4.1-bin-hadoop3/jars/arpack_combined_all-0.1.jar
spark-3.4.1-bin-hadoop3/jars/arpack-3.0.3.jar
spark-3.4.1-bin-hadoop3/jars/aopalliance-repackaged-2.6.1.jar
spark-3.4.1-bin-hadoop3/jars/antlr4-runtime-4.9.3.jar
spark-3.4.1-bin-hadoop3/jars/antlr-runtime-3.5.2.jar
spark-3.4.1-bin-hadoop3/jars/annotations-17.0.0.jar
spark-3.4.1-bin-hadoop3/jars/algebra_2.12-2.0.1.jar
spark-3.4.1-bin-hadoop3/jars/aircompressor-0.21.jar
spark-3.4.1-bin-hadoop3/jars/activation-1.1.1.jar
spark-3.4.1-bin-hadoop3/jars/ST4-4.0.4.jar
spark-3.4.1-bin-hadoop3/jars/RoaringBitmap-0.9.38.jar
spark-3.4.1-bin-hadoop3/jars/JTransforms-3.1.jar
spark-3.4.1-bin-hadoop3/jars/JLargeArrays-1.5.jar
spark-3.4.1-bin-hadoop3/jars/HikariCP-2.5.1.jar
spark-3.4.1-bin-hadoop3/jars/zstd-jni-1.5.2-5.jar
spark-3.4.1-bin-hadoop3/jars/zookeeper-jute-3.6.3.jar
spark-3.4.1-bin-hadoop3/jars/zookeeper-3.6.3.jar
spark-3.4.1-bin-hadoop3/jars/zjsonpatch-0.3.0.jar
spark-3.4.1-bin-hadoop3/jars/xz-1.9.jar
spark-3.4.1-bin-hadoop3/jars/xbean-asm9-shaded-4.22.jar
spark-3.4.1-bin-hadoop3/jars/univocity-parsers-2.9.1.jar
spark-3.4.1-bin-hadoop3/jars/transaction-api-1.1.jar
spark-3.4.1-bin-hadoop3/jars/tink-1.7.0.jar
spark-3.4.1-bin-hadoop3/jars/threeten-extra-1.7.1.jar
spark-3.4.1-bin-hadoop3/jars/super-csv-2.2.0.jar
spark-3.4.1-bin-hadoop3/jars/stream-2.9.6.jar
spark-3.4.1-bin-hadoop3/jars/stax-api-1.0.1.jar
spark-3.4.1-bin-hadoop3/jars/spire_2.12-0.17.0.jar
spark-3.4.1-bin-hadoop3/jars/spire-util_2.12-0.17.0.jar
spark-3.4.1-bin-hadoop3/jars/spire-platform_2.12-0.17.0.jar
spark-3.4.1-bin-hadoop3/jars/spire-macros_2.12-0.17.0.jar
spark-3.4.1-bin-hadoop3/jars/spark-yarn_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-unsafe_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-tags_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-streaming_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-sql_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-sketch_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-repl_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-network-shuffle_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-network-common_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-mllib_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-mllib-local_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-mesos_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-launcher_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-kvstore_2.12-3.4.1.jar
```

```
spark-3.4.1-bin-hadoop3/jars/spark-kubernetes_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-hive_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-hive-thriftserver_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-graphx_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-core_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/spark-catalyst_2.12-3.4.1.jar
spark-3.4.1-bin-hadoop3/jars/snappy-java-1.1.10.1.jar
spark-3.4.1-bin-hadoop3/jars/snakeyaml-1.33.jar
spark-3.4.1-bin-hadoop3/jars/slf4j-api-2.0.6.jar
spark-3.4.1-bin-hadoop3/jars/shims-0.9.38.jar
spark-3.4.1-bin-hadoop3/jars/scala-xml_2.12-2.1.0.jar
spark-3.4.1-bin-hadoop3/jars/scala-reflect-2.12.17.jar
spark-3.4.1-bin-hadoop3/jars/scala-parser-combinators_2.12-2.1.1.jar
spark-3.4.1-bin-hadoop3/jars/scala-library-2.12.17.jar
spark-3.4.1-bin-hadoop3/jars/scala-compiler-2.12.17.jar
spark-3.4.1-bin-hadoop3/jars/scala-collection-compat_2.12-2.7.0.jar
spark-3.4.1-bin-hadoop3/RELEASE

import os
import findspark

os.environ["JAVA_HOME"] = "/usr/lib/jvm/java-8-openjdk-amd64"
os.environ["SPARK_HOME"] = "/content/spark-3.4.1-bin-hadoop3"

findspark.init()

from pyspark.sql import SparkSession
spark =
SparkSession.builder.appName("SuperstoreCleaning").getOrCreate()

df = spark.read.csv("/content/Sample - Superstore.csv", header=True,
inferSchema=True)
df.show(5)

+------+--------------+----------+----------+-------------
+----------+--------------+----------+------------+---------------
+----------+----------+------+--------------+--------------
+----------+--------------------+--------+--------+--------+--------
+
|Row ID|      Order ID|Order Date| Ship Date|      Ship Mode|Customer
ID|  Customer Name|  Segment|      Country|          City|     State|
Postal Code|Region|     Product ID|     Category|Sub-Category|
Product Name|   Sales|Quantity|Discount|  Profit|
+------+--------------+----------+----------+-------------
+----------+--------------+----------+------------+---------------
+----------+----------+------+--------------+--------------
+----------+--------------------+--------+--------+--------+--------
+
|     1|CA-2016-152156| 11/8/2016|11/11/2016|  Second Class|   CG-
12520|   Claire Gute| Consumer|United States|     Henderson|
```

```
Kentucky|        42420| South|FUR-BO-10001798|        Furniture|
Bookcases|Bush Somerset Col...|  261.96|        2|        0| 41.9136|
|     2|CA-2016-152156| 11/8/2016|11/11/2016|  Second Class|  CG-
12520|    Claire Gute| Consumer|United States|        Henderson|
Kentucky|        42420| South|FUR-CH-10000454|        Furniture|
Chairs|Hon Deluxe Fabric...|  731.94|        3|        0| 219.582|
|     3|CA-2016-138688| 6/12/2016| 6/16/2016|  Second Class|   DV-
13045|Darrin Van Huff|Corporate|United States|    Los Angeles|
California|        90036|   West|OFF-LA-10000240|Office Supplies|
Labels|Self-Adhesive Add...|   14.62|        2|        0|  6.8714|
|     4|US-2015-108966|10/11/2015|10/18/2015|Standard Class|   SO-
20335| Sean O'Donnell| Consumer|United States|Fort Lauderdale|
Florida|        33311| South|FUR-TA-10000577|        Furniture|
Tables|Bretford CR4500 S...|957.5775|        5|     0.45|-383.031|
|     5|US-2015-108966|10/11/2015|10/18/2015|Standard Class|   SO-
20335| Sean O'Donnell| Consumer|United States|Fort Lauderdale|
Florida|        33311| South|OFF-ST-10000760|Office Supplies|
Storage|Eldon Fold 'N Rol...|  22.368|        2|      0.2|  2.5164|
+------+-------------+---------+---------+--------------
+-----------+--------------+--------+------------+---------------
+---------+----------+------+-------------+--------------
+-----------+----------------+--------+--------+--------+--------
+
only showing top 5 rows
```

🔲 Task 1: Data Cleaning with PySpark.

```
#Step 1: Show Data Sample
df.show(5)
df.printSchema()

+------+-------------+---------+---------+--------------
+-----------+--------------+--------+------------+---------------
+---------+----------+------+-------------+--------------
+-----------+----------------+--------+--------+--------+--------
+
|Row ID|     Order ID|Order Date| Ship Date|     Ship Mode|Customer
ID|  Customer Name|  Segment|     Country|         City|     State|
Postal Code|Region|     Product ID|     Category|Sub-Category|
Product Name|   Sales|Quantity|Discount|  Profit|
+------+-------------+---------+---------+--------------
+-----------+--------------+--------+------------+---------------
+---------+----------+------+-------------+--------------
+-----------+----------------+--------+--------+--------+--------
+
|     1|CA-2016-152156| 11/8/2016|11/11/2016|  Second Class|  CG-
12520|    Claire Gute| Consumer|United States|        Henderson|
Kentucky|        42420| South|FUR-BO-10001798|        Furniture|
```

```
Bookcases|Bush Somerset Col...|  261.96|        2|        0| 41.9136|
|     2|CA-2016-152156| 11/8/2016|11/11/2016|  Second Class|   CG-
12520|   Claire Gute| Consumer|United States|       Henderson|
Kentucky|      42420| South|FUR-CH-10000454|       Furniture|
Chairs|Hon Deluxe Fabric...|  731.94|        3|        0| 219.582|
|     3|CA-2016-138688| 6/12/2016| 6/16/2016|  Second Class|   DV-
13045|Darrin Van Huff|Corporate|United States|    Los Angeles|
California|      90036|  West|OFF-LA-10000240|Office Supplies|
Labels|Self-Adhesive Add...|   14.62|        2|        0|  6.8714|
|     4|US-2015-108966|10/11/2015|10/18/2015|Standard Class|   SO-
20335| Sean O'Donnell| Consumer|United States|Fort Lauderdale|
Florida|      33311| South|FUR-TA-10000577|       Furniture|
Tables|Bretford CR4500 S...|957.5775|        5|     0.45|-383.031|
|     5|US-2015-108966|10/11/2015|10/18/2015|Standard Class|   SO-
20335| Sean O'Donnell| Consumer|United States|Fort Lauderdale|
Florida|      33311| South|OFF-ST-10000760|Office Supplies|
Storage|Eldon Fold 'N Rol...|  22.368|        2|      0.2|  2.5164|
+------+--------------+---------+---------+--------------
+----------+--------------+---------+------------+---------------
+---------+----------+------+--------------+---------------
+----------+------------------+--------+--------+--------+-------
+
only showing top 5 rows

root
 |-- Row ID: integer (nullable = true)
 |-- Order ID: string (nullable = true)
 |-- Order Date: string (nullable = true)
 |-- Ship Date: string (nullable = true)
 |-- Ship Mode: string (nullable = true)
 |-- Customer ID: string (nullable = true)
 |-- Customer Name: string (nullable = true)
 |-- Segment: string (nullable = true)
 |-- Country: string (nullable = true)
 |-- City: string (nullable = true)
 |-- State: string (nullable = true)
 |-- Postal Code: integer (nullable = true)
 |-- Region: string (nullable = true)
 |-- Product ID: string (nullable = true)
 |-- Category: string (nullable = true)
 |-- Sub-Category: string (nullable = true)
 |-- Product Name: string (nullable = true)
 |-- Sales: string (nullable = true)
 |-- Quantity: string (nullable = true)
 |-- Discount: string (nullable = true)
 |-- Profit: double (nullable = true)


#Step 2: Check for Missing (Null) Values
from pyspark.sql.functions import col
```

```
df.select([col(c).isNull().alias(c) for c in df.columns]).show()

+------+--------+----------+---------+---------+-----------
+------------+-------+-------+-----+-----+-----------+------
+----------+--------+-----------+------------+-----+--------+--------
+------+
|Row ID|Order ID|Order Date|Ship Date|Ship Mode|Customer ID|Customer
Name|Segment|Country| City|State|Postal Code|Region|Product ID|
Category|Sub-Category|Product Name|Sales|Quantity|Discount|Profit|
+------+--------+----------+---------+---------+-----------
+------------+-------+-------+-----+-----+-----------+------
+----------+--------+-----------+------------+-----+--------+--------
+------+
| false|   false|     false|    false|    false|      false|
false|   false|   false|false|false|      false| false|     false|
false|       false|       false|false|   false|   false| false|
| false|   false|     false|    false|    false|      false|
false|   false|   false|false|false|      false| false|     false|
false|       false|       false|false|   false|   false| false|
| false|   false|     false|    false|    false|      false|
false|   false|   false|false|false|      false| false|     false|
false|       false|       false|false|   false|   false| false|
| false|   false|     false|    false|    false|      false|
false|   false|   false|false|false|      false| false|     false|
false|       false|       false|false|   false|   false| false|
| false|   false|     false|    false|    false|      false|
false|   false|   false|false|false|      false| false|     false|
false|       false|       false|false|   false|   false| false|
| false|   false|     false|    false|    false|      false|
false|   false|   false|false|false|      false| false|     false|
false|       false|       false|false|   false|   false| false|
| false|   false|     false|    false|    false|      false|
false|   false|   false|false|false|      false| false|     false|
false|       false|       false|false|   false|   false| false|
| false|   false|     false|    false|    false|      false|
false|   false|   false|false|false|      false| false|     false|
false|       false|       false|false|   false|   false| false|
| false|   false|     false|    false|    false|      false|
false|   false|   false|false|false|      false| false|     false|
false|       false|       false|false|   false|   false| false|
```

```
| false|   false|      false|    false|      false|        false|
false|   false|    false|false|false|        false| false|      false|
false|        false|        false|false|   false|    false| false|
| false|   false|      false|    false|      false|        false|
false|   false|    false|false|false|        false| false|      false|
false|        false|        false|false|   false|    false| false|
| false|   false|      false|    false|      false|        false|
false|   false|    false|false|false|        false| false|      false|
false|        false|        false|false|   false|    false| false|
| false|   false|      false|    false|      false|        false|
false|   false|    false|false|false|        false| false|      false|
false|        false|        false|false|   false|    false| false|
| false|   false|      false|    false|      false|        false|
false|   false|    false|false|false|        false| false|      false|
false|        false|        false|false|   false|    false| false|
| false|   false|      false|    false|      false|        false|
false|   false|    false|false|false|        false| false|      false|
false|        false|        false|false|   false|    false| false|
| false|   false|      false|    false|      false|        false|
false|   false|    false|false|false|        false| false|      false|
false|        false|        false|false|   false|    false| false|
+------+--------+----------+---------+--------+-----------
+------------+-------+-------+-----+-----+----------+------
+----------+--------+-----------+-----------+-----+--------+--------
+------+
only showing top 20 rows
```

Step 3: Drop or Fill Missing Values

```
df_clean = df.fillna({'Sales': 0, 'Profit': 0})
```

Step 4: Remove Duplicate Rows

```
df_clean = df_clean.dropDuplicates()
```

Step 5: Show Cleaned Data

```
df_clean.show(5)

+------+-------------+----------+--------+-------------+----------
+---------------+----------+------------+------------+-----------
+----------+-------+--------------+--------------+-----------
+------------------+-------+--------+-------+-------+
|Row ID|     Order ID|Order Date|Ship Date|    Ship Mode|Customer
ID|   Customer Name|    Segment|    Country|        City|
```

```
State|Postal Code| Region|       Product ID|        Category|Sub-
Category|         Product Name|  Sales|Quantity|Discount| Profit|
+------+-------------+---------+---------+-------------+----------
+---------------+----------+-----------+------------+-----------
+----------+-------+-------------+-------------+-----------
+--------------------+-------+--------+--------+-------+
|    188|CA-2016-157000| 7/16/2016|7/22/2016|Standard Class|    AM-
10360|  Alice McCarthy|   Corporate|United States|Grand Prairie|
Texas|      75051|Central|OFF-ST-10001328|Office Supplies|
Storage|Personal Filing T...| 37.224|       3|     0.2| 3.7224|
|    303|CA-2016-142545|10/28/2016|11/3/2016|Standard Class|    JD-
15895|Jonathan Doherty|   Corporate|United States|   Belleville|  New
Jersey|      7109|   East|OFF-BI-10002706|Office Supplies|
Binders|Avery Premier Hea...|  14.28|       1|      0| 6.5688|
|    392|US-2014-135972| 9/21/2014|9/23/2014|  Second Class|    JG-
15115|      Jack Garza|   Consumer|United States|   Des Moines|
Washington|      98198|   West|TEC-PH-10003012|     Technology|
Phones|Nortel Meridian M...|246.384|       2|     0.2|27.7182|
|    466|CA-2016-109869| 4/22/2016|4/29/2016|Standard Class|    TN-
21040|   Tanja Norvell|Home Office|United States|      Phoenix|
Arizona|      85023|   West|OFF-SU-10003505|Office Supplies|
Supplies|Premier Electric ...|185.376|       2|     0.2|-34.758|
|    698|CA-2015-119291| 5/14/2015|5/17/2015|   First Class|    JO-
15550|    Jesus Ocampo|Home Office|United States|      Chester|
Pennsylvania|      19013|   East|OFF-LA-10003510|Office Supplies|
Labels|Avery 4027 File F...| 97.696|       4|     0.2|31.7512|
+------+-------------+---------+---------+-------------+----------
+---------------+----------+-----------+------------+-----------
+----------+-------+-------------+-------------+-----------
+--------------------+-------+--------+--------+-------+
only showing top 5 rows
```