

input-hmp

December 11, 2021

1 Input HMP

This notebook pulls the HMP accelerometer sensor data classification data set

```
[1]: %%bash
export version=`python --version |awk '{print $2}' |awk -F"." '{print $1$2}'`

echo $version

if [ $version == '36' ] || [ $version == '37' ]; then
    echo 'Starting installation...'
    pip3 install pyspark==2.4.8 wget==3.2 > install.log 2> install.log
    if [ $? == 0 ]; then
        echo 'Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear
        ↪All Outputs)'
    else
        echo 'Installation failed, please check log:'
        cat install.log
    fi
elif [ $version == '38' ] || [ $version == '39' ]; then
    pip3 install pyspark==3.1.2 wget==3.2 > install.log 2> install.log
    if [ $? == 0 ]; then
        echo 'Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear
        ↪All Outputs)'
    else
        echo 'Installation failed, please check log:'
        cat install.log
    fi
else
    echo 'Currently only python 3.6, 3.7 , 3.8 and 3.9 are supported, in case
    ↪you need a different version please open an issue at https://github.com/IBM/
    ↪claimed/issues'
    exit -1
fi
```

37

Starting installation...

Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear All Outputs)

```
[2]: import fnmatch
import os
from pathlib import Path
from pyspark import SparkConf
from pyspark import SparkContext
from pyspark.sql.functions import lit
from pyspark.sql import SparkSession
from pyspark.sql.types import IntegerType
from pyspark.sql.types import StructField
from pyspark.sql.types import StructType
import random
import re
import shutil
import sys
```

```
[3]: # path and file name for output (default: data.csv)
data_csv = os.environ.get('data_csv', 'data.csv')

# url of master (default: local mode)
master = os.environ.get('master', "local[*]")

# temporal data storage for local execution
data_dir = os.environ.get('data_dir', '../..data/')

# sample on input data to increase processing speed 0..1 (default: 1.0)
sample = os.environ.get('sample', '1.0')
```

```
[4]: # override parameters received from a potential call using %run magic
parameters = list(
    map(
        lambda s: re.sub('$', '', s),
        map(
            lambda s: s.replace('=', '='),
            filter(
                lambda s: s.find('=') > -1,
                sys.argv
            )
        )
    )
)

for parameter in parameters:
    exec(parameter)

# cast parameters to appropriate type
sample = float(sample)
```

Lets create a local spark context (sc) and session (spark)

```
[5]: sc = SparkContext.getOrCreate(SparkConf().setMaster(master))

spark = SparkSession \
    .builder \
    .getOrCreate()
```

21/12/10 15:41:47 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
Setting default log level to "WARN".

To adjust logging level use `sc.setLogLevel(newLevel)`. For SparkR, use `setLogLevel(newLevel)`.

21/12/10 15:41:49 WARN util.Utils: Service 'SparkUI' could not bind on port 4040. Attempting port 4041.

21/12/10 15:41:49 WARN util.Utils: Service 'SparkUI' could not bind on port 4041. Attempting port 4042.

Lets pull the data in raw format from the source (github)

```
[6]: !rm -Rf HMP_Dataset
!git clone https://github.com/wchill/HMP_Dataset
```

Cloning into 'HMP_Dataset'...

remote: Enumerating objects: 865, done.

remote: Total 865 (delta 0), reused 0 (delta 0), pack-reused 865

Receiving objects: 100% (865/865), 1010.96 KiB | 7.54 MiB/s, done.

```
[7]: schema = StructType([
    StructField("x", IntegerType(), True),
    StructField("y", IntegerType(), True),
    StructField("z", IntegerType(), True)])
```

This step takes a while, it parses through all files and folders and creates a temporary dataframe for each file which gets appended to an overall data-frame “df”. In addition, a column called “class” is added to allow for straightforward usage in Spark afterwards in a supervised machine learning scenario for example.

```
[8]: d = 'HMP_Dataset/'

# filter list for all folders containing data (folders that don't start with .)
file_list_filtered = [s for s in os.listdir(d)
                      if os.path.isdir(os.path.join(d, s)) & ~fnmatch.
->fnmatch(s, '.*')]

# create pandas data frame for all the data

df = None
```

```

for category in file_list_filtered:
    data_files = os.listdir('HMP_Dataset/' + category)

    # create a temporary pandas data frame for each data file
    for data_file in data_files:
        if sample < 1.0:
            if random.random() > sample:
                print('Skipping: ' + data_file)
                continue
        print(data_file)
        temp_df = spark.read. \
            option("header", "false"). \
            option("delimiter", " "). \
            csv('HMP_Dataset/' + category + '/' + data_file, schema=schema)

        # create a column called "source" storing the current CSV file
        temp_df = temp_df.withColumn("source", lit(data_file))

        # create a column called "class" storing the current data folder
        temp_df = temp_df.withColumn("class", lit(category))

    if df is None:
        df = temp_df
    else:
        df = df.union(temp_df)

```

```

Accelerometer-2012-05-29-16-43-41-pour_water-f2.txt
Accelerometer-2012-05-30-18-26-02-pour_water-f3.txt
Accelerometer-2012-05-29-17-12-07-pour_water-m3.txt
Accelerometer-2012-06-09-22-58-08-pour_water-m11.txt
Accelerometer-2011-06-06-09-45-45-pour_water-f1.txt
Accelerometer-2011-06-02-17-04-09-pour_water-f4.txt
Accelerometer-2011-05-31-15-11-25-pour_water-f1.txt
Accelerometer-2011-06-01-14-16-35-pour_water-f1.txt
Accelerometer-2011-06-06-09-39-30-pour_water-f1.txt
Accelerometer-2011-06-02-17-45-45-pour_water-m1.txt
Accelerometer-2012-03-23-03-54-26-pour_water-m9.txt
Accelerometer-2011-03-24-10-04-32-pour_water-f1.txt
Accelerometer-2012-05-28-17-41-55-pour_water-m1.txt
Accelerometer-2011-06-02-17-33-30-pour_water-m1.txt
Accelerometer-2011-05-30-21-51-05-pour_water-m2.txt
Accelerometer-2012-06-09-22-58-28-pour_water-m11.txt
Accelerometer-2011-06-06-09-47-48-pour_water-f1.txt
Accelerometer-2012-06-07-21-31-05-pour_water-f4.txt
Accelerometer-2012-05-29-17-10-30-pour_water-m3.txt
Accelerometer-2012-06-07-21-31-24-pour_water-f4.txt
Accelerometer-2011-06-01-14-18-36-pour_water-f1.txt

```

Accelerometer-2012-05-30-19-07-14-pour_water-m4.txt
Accelerometer-2012-05-30-18-27-41-pour_water-f3.txt
Accelerometer-2012-06-07-21-28-23-pour_water-f4.txt
Accelerometer-2011-06-01-14-17-02-pour_water-f1.txt
Accelerometer-2012-05-30-19-59-17-pour_water-m3.txt
Accelerometer-2011-06-02-17-06-44-pour_water-f4.txt
Accelerometer-2011-06-02-17-06-15-pour_water-f4.txt
Accelerometer-2012-05-29-17-19-55-pour_water-m3.txt
Accelerometer-2012-06-07-21-29-48-pour_water-f4.txt
Accelerometer-2011-06-01-14-25-16-pour_water-f1.txt
Accelerometer-2011-06-06-09-48-59-pour_water-f1.txt
Accelerometer-2011-04-05-18-54-14-pour_water-f1.txt
Accelerometer-2012-03-26-05-01-39-pour_water-m3.txt
Accelerometer-2011-03-24-13-30-01-pour_water-f1.txt
Accelerometer-2011-06-06-09-42-11-pour_water-f1.txt
Accelerometer-2012-06-07-21-31-48-pour_water-f4.txt
Accelerometer-2012-05-30-18-27-15-pour_water-f3.txt
Accelerometer-2012-05-30-19-57-40-pour_water-m3.txt
Accelerometer-2011-05-31-16-34-32-pour_water-f1.txt
Accelerometer-2012-03-23-03-55-46-pour_water-m9.txt
Accelerometer-2011-05-30-21-05-39-pour_water-f1.txt
Accelerometer-2012-05-25-18-37-06-pour_water-f4.txt
Accelerometer-2011-06-06-09-56-28-pour_water-f1.txt
Accelerometer-2012-05-28-17-49-34-pour_water-m1.txt
Accelerometer-2012-06-09-22-56-17-pour_water-m11.txt
Accelerometer-2012-06-09-22-56-53-pour_water-m11.txt
Accelerometer-2012-06-07-21-30-37-pour_water-f4.txt
Accelerometer-2011-06-02-16-52-30-pour_water-f4.txt
Accelerometer-2011-06-01-14-32-38-pour_water-f1.txt
Accelerometer-2012-06-07-21-33-21-pour_water-f4.txt
Accelerometer-2012-05-30-19-08-20-pour_water-m4.txt
Accelerometer-2012-05-28-17-46-43-pour_water-m1.txt
Accelerometer-2011-06-02-17-23-16-pour_water-m1.txt
Accelerometer-2012-06-09-22-55-08-pour_water-m11.txt
Accelerometer-2012-03-26-05-03-27-pour_water-m3.txt
Accelerometer-2012-06-09-22-55-42-pour_water-m11.txt
Accelerometer-2011-06-06-09-44-12-pour_water-f1.txt
Accelerometer-2011-04-11-12-55-26-pour_water-f1.txt
Accelerometer-2012-06-07-21-28-48-pour_water-f4.txt
Accelerometer-2012-06-07-21-29-09-pour_water-f4.txt
Accelerometer-2011-06-06-09-40-34-pour_water-f1.txt
Accelerometer-2012-06-09-22-54-40-pour_water-m11.txt
Accelerometer-2011-06-01-16-46-50-pour_water-f1.txt
Accelerometer-2012-06-07-21-32-12-pour_water-f4.txt
Accelerometer-2011-06-01-14-13-29-pour_water-f1.txt
Accelerometer-2012-05-30-18-26-49-pour_water-f3.txt
Accelerometer-2011-06-06-09-46-20-pour_water-f1.txt
Accelerometer-2012-05-28-17-43-20-pour_water-m1.txt

Accelerometer-2012-05-30-19-50-42-pour_water-f2.txt
Accelerometer-2012-03-26-04-53-59-pour_water-f2.txt
Accelerometer-2011-06-02-17-28-27-pour_water-m1.txt
Accelerometer-2012-06-07-21-35-50-pour_water-f4.txt
Accelerometer-2011-06-06-09-50-17-pour_water-f1.txt
Accelerometer-2012-06-07-21-34-47-pour_water-f4.txt
Accelerometer-2012-05-30-19-56-40-pour_water-m3.txt
Accelerometer-2012-05-25-18-29-48-pour_water-f4.txt
Accelerometer-2012-05-25-18-34-46-pour_water-f4.txt
Accelerometer-2012-05-25-18-31-58-pour_water-f4.txt
Accelerometer-2011-06-02-16-50-40-pour_water-f4.txt
Accelerometer-2012-05-30-19-54-24-pour_water-f2.txt
Accelerometer-2012-06-07-21-30-16-pour_water-f4.txt
Accelerometer-2011-03-24-10-51-12-pour_water-f1.txt
Accelerometer-2012-05-30-19-52-29-pour_water-f2.txt
Accelerometer-2011-06-06-09-51-53-pour_water-f1.txt
Accelerometer-2012-05-30-19-08-50-pour_water-m4.txt
Accelerometer-2012-05-29-16-49-00-pour_water-f2.txt
Accelerometer-2012-06-07-21-33-47-pour_water-f4.txt
Accelerometer-2011-06-06-09-49-51-pour_water-f1.txt
Accelerometer-2012-03-26-04-55-40-pour_water-f2.txt
Accelerometer-2012-06-09-22-57-12-pour_water-m11.txt
Accelerometer-2011-06-01-14-12-53-pour_water-f1.txt
Accelerometer-2012-06-07-21-35-28-pour_water-f4.txt
Accelerometer-2012-05-30-19-07-43-pour_water-m4.txt
Accelerometer-2012-06-07-21-32-37-pour_water-f4.txt
Accelerometer-2011-06-01-14-27-40-pour_water-f1.txt
Accelerometer-2012-03-23-03-46-21-pour_water-m9.txt
Accelerometer-2012-06-07-21-27-46-pour_water-f4.txt
Accelerometer-2011-06-06-09-55-25-pour_water-f1.txt
Accelerometer-2012-06-07-21-34-22-pour_water-f4.txt
Accelerometer-2011-04-12-21-42-53-standup_chair-m8.txt
Accelerometer-2012-05-25-18-27-29-standup_chair-f4.txt
Accelerometer-2011-12-11-08-09-59-standup_chair-f4.txt
Accelerometer-2011-12-11-08-15-55-standup_chair-f4.txt
Accelerometer-2011-06-01-14-43-42-standup_chair-f1.txt
Accelerometer-2012-03-26-04-54-30-standup_chair-f2.txt
Accelerometer-2011-03-23-10-39-18-standup_chair-f1.txt
Accelerometer-2011-12-11-08-20-56-standup_chair-m2.txt
Accelerometer-2011-12-05-09-38-00-standup_chair-f1.txt
Accelerometer-2011-06-02-17-42-24-standup_chair-m1.txt
Accelerometer-2011-06-02-16-43-22-standup_chair-f4.txt
Accelerometer-2011-03-24-16-09-19-standup_chair-f2.txt
Accelerometer-2011-06-02-17-05-17-standup_chair-f4.txt
Accelerometer-2011-04-12-21-45-21-standup_chair-m8.txt
Accelerometer-2011-12-11-08-19-58-standup_chair-m2.txt
Accelerometer-2011-06-02-17-26-55-standup_chair-m1.txt
Accelerometer-2012-05-29-17-12-51-standup_chair-m3.txt

Accelerometer-2011-04-11-11-48-09-standup_chair-f1.txt
Accelerometer-2011-06-02-16-44-18-standup_chair-f4.txt
Accelerometer-2011-06-01-14-50-10-standup_chair-f1.txt
Accelerometer-2011-03-23-10-42-01-standup_chair-f1.txt
Accelerometer-2011-05-30-10-23-55-standup_chair-m1.txt
Accelerometer-2012-05-28-17-40-45-standup_chair-m1.txt
Accelerometer-2011-06-01-14-40-19-standup_chair-f1.txt
Accelerometer-2011-06-02-16-55-12-standup_chair-f4.txt
Accelerometer-2011-12-05-09-48-17-standup_chair-f1.txt
Accelerometer-2012-03-23-03-48-20-standup_chair-m9.txt
Accelerometer-2011-05-30-08-24-19-standup_chair-f1.txt
Accelerometer-2011-06-01-14-39-38-standup_chair-f1.txt
Accelerometer-2012-05-29-16-47-10-standup_chair-f2.txt
Accelerometer-2011-03-24-09-49-36-standup_chair-f1.txt
Accelerometer-2011-12-11-08-23-15-standup_chair-m2.txt
Accelerometer-2011-05-31-15-13-49-standup_chair-f1.txt
Accelerometer-2011-05-30-10-31-41-standup_chair-m1.txt
Accelerometer-2011-06-01-14-38-03-standup_chair-f1.txt
Accelerometer-2011-12-11-08-13-41-standup_chair-f4.txt
Accelerometer-2012-03-26-04-58-13-standup_chair-f2.txt
Accelerometer-2011-12-11-08-14-55-standup_chair-f4.txt
Accelerometer-2011-03-23-10-47-59-standup_chair-f1.txt
Accelerometer-2011-05-31-14-59-53-standup_chair-f1.txt
Accelerometer-2011-03-24-11-19-29-standup_chair-f1.txt
Accelerometer-2011-05-30-09-25-14-standup_chair-f1.txt
Accelerometer-2011-03-24-10-38-17-standup_chair-f1.txt
Accelerometer-2011-06-02-17-41-11-standup_chair-m1.txt
Accelerometer-2011-03-23-10-45-51-standup_chair-f1.txt
Accelerometer-2011-12-05-09-55-36-standup_chair-f1.txt
Accelerometer-2012-05-25-18-28-24-standup_chair-f4.txt
Accelerometer-2011-12-05-09-40-57-standup_chair-f1.txt
Accelerometer-2011-05-30-08-32-03-standup_chair-f1.txt
Accelerometer-2012-05-28-17-50-40-standup_chair-m1.txt
Accelerometer-2012-05-29-17-14-27-standup_chair-m3.txt
Accelerometer-2011-06-02-16-45-48-standup_chair-f4.txt
Accelerometer-2011-06-01-14-45-33-standup_chair-f1.txt
Accelerometer-2011-12-11-08-24-09-standup_chair-m2.txt
Accelerometer-2011-06-02-16-53-39-standup_chair-f4.txt
Accelerometer-2011-06-02-17-44-52-standup_chair-m1.txt
Accelerometer-2011-12-05-09-50-23-standup_chair-f1.txt
Accelerometer-2011-06-01-14-41-32-standup_chair-f1.txt
Accelerometer-2011-05-30-21-33-37-standup_chair-m2.txt
Accelerometer-2011-06-02-17-25-13-standup_chair-m1.txt
Accelerometer-2012-05-29-16-43-05-standup_chair-f2.txt
Accelerometer-2012-05-28-17-45-43-standup_chair-m1.txt
Accelerometer-2011-05-31-16-23-03-standup_chair-f1.txt
Accelerometer-2011-06-02-17-31-39-standup_chair-m1.txt
Accelerometer-2011-06-01-14-46-35-standup_chair-f1.txt

Accelerometer-2011-05-30-09-24-04-standup_chair-f1.txt
Accelerometer-2011-05-30-20-50-04-standup_chair-f1.txt
Accelerometer-2011-05-30-21-52-55-standup_chair-m2.txt
Accelerometer-2011-06-01-14-51-21-standup_chair-f1.txt
Accelerometer-2012-03-26-05-02-40-standup_chair-m3.txt
Accelerometer-2011-12-11-08-22-05-standup_chair-m2.txt
Accelerometer-2012-05-25-18-33-08-standup_chair-f4.txt
Accelerometer-2011-12-05-09-52-58-standup_chair-f1.txt
Accelerometer-2011-06-02-16-54-15-standup_chair-f4.txt
Accelerometer-2011-06-02-17-26-02-standup_chair-m1.txt
Accelerometer-2011-03-29-09-10-24-standup_chair-f1.txt
Accelerometer-2011-12-11-08-19-06-standup_chair-m2.txt
Accelerometer-2011-12-11-08-12-46-standup_chair-f4.txt
Accelerometer-2011-05-31-16-38-19-standup_chair-f1.txt
Accelerometer-2011-06-01-14-52-02-standup_chair-f1.txt
Accelerometer-2011-05-30-20-56-05-standup_chair-f1.txt
Accelerometer-2011-06-02-17-04-40-standup_chair-f4.txt
Accelerometer-2011-12-05-09-45-47-standup_chair-f1.txt
Accelerometer-2012-03-26-05-04-33-standup_chair-m3.txt
Accelerometer-2011-05-30-21-38-19-standup_chair-m2.txt
Accelerometer-2011-04-05-18-25-12-standup_chair-f1.txt
Accelerometer-2012-03-23-03-44-39-standup_chair-m9.txt
Accelerometer-2011-06-02-16-46-25-standup_chair-f4.txt
Accelerometer-2011-03-29-09-04-40-standup_chair-f1.txt
Accelerometer-2012-05-25-18-35-48-standup_chair-f4.txt
Accelerometer-2011-04-08-18-09-06-standup_chair-m4.txt
Accelerometer-2011-05-31-14-54-09-standup_chair-f1.txt
Accelerometer-2011-06-02-16-44-59-standup_chair-f4.txt
Accelerometer-2011-04-08-17-34-10-standup_chair-f3.txt
Accelerometer-2011-12-11-08-11-36-standup_chair-f4.txt
Accelerometer-2012-05-28-17-39-31-standup_chair-m1.txt
Accelerometer-2011-04-08-17-32-45-standup_chair-f3.txt
Accelerometer-2011-04-11-13-24-10-standup_chair-f1.txt
Accelerometer-2011-05-30-21-07-51-standup_chair-f1.txt
Accelerometer-2011-05-30-20-50-30-standup_chair-f1.txt
Accelerometer-2011-06-02-17-43-41-standup_chair-m1.txt
Accelerometer-2011-05-31-16-27-45-standup_chair-f1.txt
Accelerometer-2011-05-30-21-08-40-comb_hair-f1.txt
Accelerometer-2011-05-30-21-57-03-comb_hair-m2.txt
Accelerometer-2011-06-06-10-10-30-comb_hair-f1.txt
Accelerometer-2011-06-02-16-14-07-comb_hair-f1.txt
Accelerometer-2011-06-02-17-03-33-comb_hair-f4.txt
Accelerometer-2011-06-06-10-08-56-comb_hair-f1.txt
Accelerometer-2011-05-30-09-39-49-comb_hair-f1.txt
Accelerometer-2011-05-31-15-14-55-comb_hair-f1.txt
Accelerometer-2011-06-02-16-56-03-comb_hair-f4.txt
Accelerometer-2011-03-24-10-57-40-comb_hair-f1.txt
Accelerometer-2011-06-02-17-18-58-comb_hair-m1.txt

Accelerometer-2011-06-02-16-12-44-comb_hair-f1.txt
Accelerometer-2011-06-02-16-48-41-comb_hair-f4.txt
Accelerometer-2011-03-24-16-10-36-comb_hair-f2.txt
Accelerometer-2011-06-02-16-49-27-comb_hair-f4.txt
Accelerometer-2011-06-02-16-20-04-comb_hair-f1.txt
Accelerometer-2011-04-11-13-31-24-comb_hair-f1.txt
Accelerometer-2011-06-02-17-02-50-comb_hair-f4.txt
Accelerometer-2011-03-29-08-57-24-comb_hair-f1.txt
Accelerometer-2011-05-30-08-32-58-comb_hair-f1.txt
Accelerometer-2011-06-02-16-18-54-comb_hair-f1.txt
Accelerometer-2011-03-24-09-44-34-comb_hair-f1.txt
Accelerometer-2011-06-02-10-44-17-comb_hair-f1.txt
Accelerometer-2011-03-24-10-26-33-comb_hair-f1.txt
Accelerometer-2011-06-06-10-03-47-comb_hair-f1.txt
Accelerometer-2011-06-02-17-32-57-comb_hair-m1.txt
Accelerometer-2011-05-30-10-36-26-comb_hair-m1.txt
Accelerometer-2011-06-02-10-41-33-comb_hair-f1.txt
Accelerometer-2011-06-06-10-05-40-comb_hair-f1.txt
Accelerometer-2011-06-02-17-39-02-comb_hair-m1.txt
Accelerometer-2011-06-02-17-39-54-comb_hair-m1.txt
Accelerometer-2011-05-30-10-34-16-brush_teeth-m1.txt
Accelerometer-2011-04-11-13-29-54-brush_teeth-f1.txt
Accelerometer-2011-06-02-10-45-50-brush_teeth-f1.txt
Accelerometer-2011-04-11-13-28-18-brush_teeth-f1.txt
Accelerometer-2011-05-30-09-36-50-brush_teeth-f1.txt
Accelerometer-2011-06-02-10-42-22-brush_teeth-f1.txt
Accelerometer-2011-05-30-21-55-04-brush_teeth-m2.txt
Accelerometer-2011-05-30-21-10-57-brush_teeth-f1.txt
Accelerometer-2011-06-06-10-48-05-brush_teeth-f1.txt
Accelerometer-2011-06-06-10-45-27-brush_teeth-f1.txt
Accelerometer-2011-05-30-08-35-11-brush_teeth-f1.txt
Accelerometer-2011-05-31-15-16-47-brush_teeth-f1.txt
Accelerometer-2011-06-02-17-26-23-sitdown_chair-m1.txt
Accelerometer-2011-06-01-14-46-43-sitdown_chair-f1.txt
Accelerometer-2012-03-26-04-58-33-sitdown_chair-f2.txt
Accelerometer-2011-05-31-16-33-27-sitdown_chair-f1.txt
Accelerometer-2011-06-02-17-25-34-sitdown_chair-m1.txt
Accelerometer-2011-12-11-08-12-14-sitdown_chair-f4.txt
Accelerometer-2011-05-30-08-31-30-sitdown_chair-f1.txt
Accelerometer-2011-06-02-16-46-43-sitdown_chair-f4.txt
Accelerometer-2011-04-08-17-34-35-sitdown_chair-f3.txt
Accelerometer-2011-06-06-09-34-12-sitdown_chair-f1.txt
Accelerometer-2011-06-06-09-35-43-sitdown_chair-f1.txt
Accelerometer-2011-04-11-11-45-28-sitdown_chair-f1.txt
Accelerometer-2011-06-02-17-32-07-sitdown_chair-m1.txt
Accelerometer-2011-12-05-09-39-34-sitdown_chair-f1.txt
Accelerometer-2011-12-11-08-24-32-sitdown_chair-m2.txt
Accelerometer-2011-05-30-21-48-01-sitdown_chair-m2.txt

Accelerometer-2011-06-02-17-45-12-sitdown_chair-m1.txt
Accelerometer-2011-06-02-16-54-34-sitdown_chair-f4.txt
Accelerometer-2012-03-26-05-02-58-sitdown_chair-m3.txt
Accelerometer-2011-05-31-16-27-00-sitdown_chair-f1.txt
Accelerometer-2012-03-23-03-48-40-sitdown_chair-m9.txt
Accelerometer-2011-04-05-18-47-38-sitdown_chair-f1.txt
Accelerometer-2011-04-05-18-22-14-sitdown_chair-f1.txt
Accelerometer-2011-12-05-09-50-54-sitdown_chair-f1.txt
Accelerometer-2011-12-11-08-13-16-sitdown_chair-f4.txt
Accelerometer-2011-06-06-09-35-11-sitdown_chair-f1.txt
Accelerometer-2011-06-01-14-45-42-sitdown_chair-f1.txt
Accelerometer-2011-05-31-16-22-37-sitdown_chair-f1.txt
Accelerometer-2011-04-12-21-43-15-sitdown_chair-m8.txt
Accelerometer-2011-12-05-09-48-48-sitdown_chair-f1.txt
Accelerometer-2011-05-30-09-24-48-sitdown_chair-f1.txt
Accelerometer-2011-03-29-09-12-27-sitdown_chair-f1.txt
Accelerometer-2011-12-11-08-16-20-sitdown_chair-f4.txt
Accelerometer-2011-06-01-14-51-28-sitdown_chair-f1.txt
Accelerometer-2011-06-02-16-15-55-sitdown_chair-f1.txt
Accelerometer-2011-12-11-08-19-32-sitdown_chair-m2.txt
Accelerometer-2011-06-02-17-44-20-sitdown_chair-m1.txt
Accelerometer-2011-03-24-09-50-16-sitdown_chair-f1.txt
Accelerometer-2011-12-11-08-22-36-sitdown_chair-m2.txt
Accelerometer-2011-05-30-21-04-13-sitdown_chair-f1.txt
Accelerometer-2011-03-29-09-06-48-sitdown_chair-f1.txt
Accelerometer-2011-05-30-10-31-12-sitdown_chair-m1.txt
Accelerometer-2011-12-05-09-53-32-sitdown_chair-f1.txt
Accelerometer-2011-06-02-17-04-59-sitdown_chair-f4.txt
Accelerometer-2011-06-01-14-41-42-sitdown_chair-f1.txt
Accelerometer-2011-06-01-14-50-18-sitdown_chair-f1.txt
Accelerometer-2011-12-05-09-44-08-sitdown_chair-f1.txt
Accelerometer-2011-06-02-16-55-35-sitdown_chair-f4.txt
Accelerometer-2011-12-05-09-46-34-sitdown_chair-f1.txt
Accelerometer-2011-12-11-08-15-21-sitdown_chair-f4.txt
Accelerometer-2011-06-02-17-05-36-sitdown_chair-f4.txt
Accelerometer-2011-12-11-08-14-09-sitdown_chair-f4.txt
Accelerometer-2011-03-24-16-09-29-sitdown_chair-f2.txt
Accelerometer-2012-03-26-05-04-48-sitdown_chair-m3.txt
Accelerometer-2011-06-02-17-42-45-sitdown_chair-m1.txt
Accelerometer-2011-06-02-16-44-37-sitdown_chair-f4.txt
Accelerometer-2011-12-11-08-11-11-sitdown_chair-f4.txt
Accelerometer-2011-05-30-20-49-32-sitdown_chair-f1.txt
Accelerometer-2011-06-01-14-37-35-sitdown_chair-f1.txt
Accelerometer-2011-06-02-16-46-07-sitdown_chair-f4.txt
Accelerometer-2011-06-01-14-43-55-sitdown_chair-f1.txt
Accelerometer-2011-06-02-16-21-36-sitdown_chair-f1.txt
Accelerometer-2011-05-31-14-53-37-sitdown_chair-f1.txt
Accelerometer-2011-03-24-10-27-33-sitdown_chair-f1.txt

Accelerometer-2011-06-02-16-17-10-sitdown_chair-f1.txt
Accelerometer-2011-04-12-21-42-24-sitdown_chair-m8.txt
Accelerometer-2011-12-05-09-58-23-sitdown_chair-f1.txt
Accelerometer-2012-05-25-18-27-57-sitdown_chair-f4.txt
Accelerometer-2011-05-30-10-21-50-sitdown_chair-m1.txt
Accelerometer-2011-06-02-16-21-01-sitdown_chair-f1.txt
Accelerometer-2011-06-06-09-36-06-sitdown_chair-f1.txt
Accelerometer-2012-05-28-17-46-13-sitdown_chair-m1.txt
Accelerometer-2011-05-30-08-22-28-sitdown_chair-f1.txt
Accelerometer-2012-05-25-18-36-06-sitdown_chair-f4.txt
Accelerometer-2011-06-02-16-43-56-sitdown_chair-f4.txt
Accelerometer-2011-04-08-17-33-10-sitdown_chair-f3.txt
Accelerometer-2012-03-23-03-45-26-sitdown_chair-m9.txt
Accelerometer-2011-06-02-17-41-43-sitdown_chair-m1.txt
Accelerometer-2011-05-30-20-55-28-sitdown_chair-f1.txt
Accelerometer-2011-06-01-14-39-48-sitdown_chair-f1.txt
Accelerometer-2012-05-28-17-41-12-sitdown_chair-m1.txt
Accelerometer-2011-04-08-18-09-40-sitdown_chair-m4.txt
Accelerometer-2011-06-01-14-40-31-sitdown_chair-f1.txt
Accelerometer-2011-05-30-21-37-52-sitdown_chair-m2.txt
Accelerometer-2011-05-30-21-33-15-sitdown_chair-m2.txt
Accelerometer-2011-06-01-14-38-38-sitdown_chair-f1.txt
Accelerometer-2011-12-11-08-21-20-sitdown_chair-m2.txt
Accelerometer-2012-05-25-18-28-46-sitdown_chair-f4.txt
Accelerometer-2012-05-25-18-33-29-sitdown_chair-f4.txt
Accelerometer-2011-05-31-14-59-27-sitdown_chair-f1.txt
Accelerometer-2011-06-02-16-45-19-sitdown_chair-f4.txt
Accelerometer-2011-12-11-08-23-42-sitdown_chair-m2.txt
Accelerometer-2011-05-31-15-07-32-sitdown_chair-f1.txt
Accelerometer-2011-05-30-09-23-12-sitdown_chair-f1.txt
Accelerometer-2011-12-11-08-20-24-sitdown_chair-m2.txt
Accelerometer-2011-06-02-17-27-18-sitdown_chair-m1.txt
Accelerometer-2012-03-26-04-54-57-sitdown_chair-f2.txt
Accelerometer-2011-05-30-20-48-57-sitdown_chair-f1.txt
Accelerometer-2011-06-02-16-53-58-sitdown_chair-f4.txt
Accelerometer-2012-05-28-17-40-02-sitdown_chair-m1.txt
Accelerometer-2012-06-12-15-28-34-getup_bed-m4.txt
Accelerometer-2011-05-30-09-33-26-getup_bed-f1.txt
Accelerometer-2012-06-12-15-52-04-getup_bed-f3.txt
Accelerometer-2011-05-31-15-19-41-getup_bed-f1.txt
Accelerometer-2012-06-20-21-59-57-getup_bed-m10.txt
Accelerometer-2012-06-07-22-16-05-getup_bed-f4.txt
Accelerometer-2012-06-07-22-30-31-getup_bed-f4.txt
Accelerometer-2012-06-20-20-33-22-getup_bed-f5.txt
Accelerometer-2012-06-12-15-30-07-getup_bed-m4.txt
Accelerometer-2012-06-20-21-52-24-getup_bed-m10.txt
Accelerometer-2012-06-12-15-51-25-getup_bed-f3.txt
Accelerometer-2012-06-12-15-54-33-getup_bed-f3.txt

Accelerometer-2012-06-12-18-52-37-getup_bed-m3.txt
Accelerometer-2012-06-12-18-51-33-getup_bed-m3.txt
Accelerometer-2011-06-02-16-58-46-getup_bed-f4.txt
Accelerometer-2012-05-30-21-53-05-getup_bed-m2.txt
Accelerometer-2012-06-12-15-36-02-getup_bed-m4.txt
Accelerometer-2011-05-31-16-25-09-getup_bed-f1.txt
Accelerometer-2012-06-12-18-50-50-getup_bed-m3.txt
Accelerometer-2012-06-12-18-44-53-getup_bed-f2.txt
Accelerometer-2012-06-12-18-49-31-getup_bed-m3.txt
Accelerometer-2012-06-12-15-31-56-getup_bed-m4.txt
Accelerometer-2012-06-12-15-34-01-getup_bed-m4.txt
Accelerometer-2012-05-30-21-53-38-getup_bed-m2.txt
Accelerometer-2011-05-30-08-26-56-getup_bed-f1.txt
Accelerometer-2012-06-12-15-32-38-getup_bed-m4.txt
Accelerometer-2012-06-20-20-30-45-getup_bed-f5.txt
Accelerometer-2012-06-12-15-54-03-getup_bed-f3.txt
Accelerometer-2012-05-28-17-54-37-getup_bed-m1.txt
Accelerometer-2012-06-12-15-57-21-getup_bed-f3.txt
Accelerometer-2011-04-11-13-34-05-getup_bed-f1.txt
Accelerometer-2012-06-20-20-29-11-getup_bed-f5.txt
Accelerometer-2012-06-20-21-55-30-getup_bed-m10.txt
Accelerometer-2012-06-12-15-58-01-getup_bed-f3.txt
Accelerometer-2012-06-07-22-24-33-getup_bed-f4.txt
Accelerometer-2012-06-12-15-50-48-getup_bed-f3.txt
Accelerometer-2011-05-31-15-02-55-getup_bed-f1.txt
Accelerometer-2012-06-20-21-58-13-getup_bed-m10.txt
Accelerometer-2012-06-12-15-29-15-getup_bed-m4.txt
Accelerometer-2012-06-20-20-29-49-getup_bed-f5.txt
Accelerometer-2011-04-05-18-28-21-getup_bed-f1.txt
Accelerometer-2012-06-20-20-27-19-getup_bed-f5.txt
Accelerometer-2011-03-29-09-49-03-getup_bed-f1.txt
Accelerometer-2011-05-30-10-27-01-getup_bed-m1.txt
Accelerometer-2012-05-28-17-55-04-getup_bed-m1.txt
Accelerometer-2012-06-20-20-34-30-getup_bed-f5.txt
Accelerometer-2011-06-02-16-57-57-getup_bed-f4.txt
Accelerometer-2012-06-12-15-31-01-getup_bed-m4.txt
Accelerometer-2012-06-07-22-31-18-getup_bed-f4.txt
Accelerometer-2012-06-12-18-40-26-getup_bed-f2.txt
Accelerometer-2012-05-30-21-52-18-getup_bed-m2.txt
Accelerometer-2012-06-20-20-28-27-getup_bed-f5.txt
Accelerometer-2011-05-30-08-38-15-getup_bed-f1.txt
Accelerometer-2011-05-31-16-30-18-getup_bed-f1.txt
Accelerometer-2012-06-07-22-16-42-getup_bed-f4.txt
Accelerometer-2012-06-20-21-57-33-getup_bed-m10.txt
Accelerometer-2012-06-12-15-34-40-getup_bed-m4.txt
Accelerometer-2012-05-30-21-54-12-getup_bed-m2.txt
Accelerometer-2011-05-30-21-13-57-getup_bed-f1.txt
Accelerometer-2011-05-30-21-59-46-getup_bed-m2.txt

Accelerometer-2012-06-20-21-53-06-getup_bed-m10.txt
Accelerometer-2012-06-07-22-26-32-getup_bed-f4.txt
Accelerometer-2012-06-12-18-44-04-getup_bed-f2.txt
Accelerometer-2012-06-12-18-42-44-getup_bed-f2.txt
Accelerometer-2012-06-12-15-53-20-getup_bed-f3.txt
Accelerometer-2011-06-02-17-00-08-getup_bed-f4.txt
Accelerometer-2012-06-07-22-19-25-getup_bed-f4.txt
Accelerometer-2012-06-20-21-56-36-getup_bed-m10.txt
Accelerometer-2012-06-07-22-15-16-getup_bed-f4.txt
Accelerometer-2011-04-11-11-53-01-getup_bed-f1.txt
Accelerometer-2012-06-12-15-56-41-getup_bed-f3.txt
Accelerometer-2012-05-28-17-53-29-getup_bed-m1.txt
Accelerometer-2011-05-31-14-57-24-getup_bed-f1.txt
Accelerometer-2011-05-30-20-59-57-getup_bed-f1.txt
Accelerometer-2012-06-12-18-52-06-getup_bed-m3.txt
Accelerometer-2011-06-02-17-22-34-getup_bed-m1.txt
Accelerometer-2012-06-12-18-41-40-getup_bed-f2.txt
Accelerometer-2012-05-30-21-51-41-getup_bed-m2.txt
Accelerometer-2012-06-07-22-20-59-getup_bed-f4.txt
Accelerometer-2012-06-12-18-43-26-getup_bed-f2.txt
Accelerometer-2012-06-20-22-00-55-getup_bed-m10.txt
Accelerometer-2012-06-20-21-53-40-getup_bed-m10.txt
Accelerometer-2012-06-12-18-48-47-getup_bed-m3.txt
Accelerometer-2012-06-07-22-28-50-getup_bed-f4.txt
Accelerometer-2012-06-07-22-23-46-getup_bed-f4.txt
Accelerometer-2012-06-07-22-17-45-getup_bed-f4.txt
Accelerometer-2011-05-30-21-36-01-getup_bed-m2.txt
Accelerometer-2012-06-20-20-31-40-getup_bed-f5.txt
Accelerometer-2012-06-12-18-50-08-getup_bed-m3.txt
Accelerometer-2011-05-30-10-39-27-getup_bed-m1.txt
Accelerometer-2012-06-20-20-32-40-getup_bed-f5.txt
Accelerometer-2012-05-28-17-52-54-getup_bed-m1.txt
Accelerometer-2012-06-12-15-52-46-getup_bed-f3.txt
Accelerometer-2012-06-12-18-39-37-getup_bed-f2.txt
Accelerometer-2012-05-28-17-54-04-getup_bed-m1.txt
Accelerometer-2011-05-30-21-42-30-getup_bed-m2.txt
Accelerometer-2012-06-12-15-35-29-getup_bed-m4.txt
Accelerometer-2011-05-30-20-53-40-getup_bed-f1.txt
Accelerometer-2011-03-29-09-21-17-getup_bed-f1.txt
Accelerometer-2011-05-30-09-42-46-getup_bed-f1.txt
Accelerometer-2011-03-29-09-24-50-getup_bed-f1.txt
Accelerometer-2011-03-24-13-33-22-eat_soup-f1.txt
Accelerometer-2011-03-24-13-44-18-eat_soup-f1.txt
Accelerometer-2011-03-24-13-56-42-eat_soup-f1.txt
Accelerometer-2011-03-29-09-52-41-use_telephone-f1.txt
Accelerometer-2011-05-30-08-27-44-use_telephone-f1.txt
Accelerometer-2011-03-29-09-32-59-use_telephone-f1.txt
Accelerometer-2011-05-30-10-28-13-use_telephone-m1.txt

Accelerometer-2011-04-05-18-29-19-use_telephone-f1.txt
Accelerometer-2011-05-30-21-00-40-use_telephone-f1.txt
Accelerometer-2011-04-11-11-54-10-use_telephone-f1.txt
Accelerometer-2011-03-29-09-30-56-use_telephone-f1.txt
Accelerometer-2011-05-31-15-03-53-use_telephone-f1.txt
Accelerometer-2011-05-30-09-34-12-use_telephone-f1.txt
Accelerometer-2011-05-31-16-31-11-use_telephone-f1.txt
Accelerometer-2011-05-30-21-43-16-use_telephone-m2.txt
Accelerometer-2011-04-11-11-53-34-use_telephone-f1.txt
Accelerometer-2011-03-24-13-12-52-eat_meat-f1.txt
Accelerometer-2011-03-24-13-17-42-eat_meat-f1.txt
Accelerometer-2011-03-24-13-06-15-eat_meat-f1.txt
Accelerometer-2011-03-24-13-21-39-eat_meat-f1.txt
Accelerometer-2011-03-24-13-10-14-eat_meat-f1.txt
Accelerometer-2011-05-30-21-59-16-liedown_bed-m2.txt
Accelerometer-2011-04-11-11-52-20-liedown_bed-f1.txt
Accelerometer-2011-05-30-08-25-59-liedown_bed-f1.txt
Accelerometer-2011-03-29-09-23-22-liedown_bed-f1.txt
Accelerometer-2011-03-29-09-19-22-liedown_bed-f1.txt
Accelerometer-2011-06-02-17-00-38-liedown_bed-f4.txt
Accelerometer-2011-05-30-10-38-41-liedown_bed-m1.txt
Accelerometer-2011-05-30-09-41-49-liedown_bed-f1.txt
Accelerometer-2011-05-30-21-35-19-liedown_bed-m2.txt
Accelerometer-2011-05-31-16-29-43-liedown_bed-f1.txt
Accelerometer-2011-05-31-15-18-50-liedown_bed-f1.txt
Accelerometer-2011-05-30-10-26-14-liedown_bed-m1.txt
Accelerometer-2011-05-31-15-02-19-liedown_bed-f1.txt
Accelerometer-2011-06-02-17-21-57-liedown_bed-m1.txt
Accelerometer-2011-04-11-13-33-26-liedown_bed-f1.txt
Accelerometer-2011-06-02-16-57-35-liedown_bed-f4.txt
Accelerometer-2011-05-30-20-52-31-liedown_bed-f1.txt
Accelerometer-2011-05-31-14-56-04-liedown_bed-f1.txt
Accelerometer-2011-03-29-09-45-46-liedown_bed-f1.txt
Accelerometer-2011-06-02-16-58-20-liedown_bed-f4.txt
Accelerometer-2011-06-02-16-59-13-liedown_bed-f4.txt
Accelerometer-2011-05-30-21-41-32-liedown_bed-m2.txt
Accelerometer-2011-05-30-09-32-42-liedown_bed-f1.txt
Accelerometer-2011-05-30-20-59-04-liedown_bed-f1.txt
Accelerometer-2011-05-30-21-13-15-liedown_bed-f1.txt
Accelerometer-2011-05-31-16-24-36-liedown_bed-f1.txt
Accelerometer-2011-04-05-18-27-12-liedown_bed-f1.txt
Accelerometer-2011-05-30-08-37-27-liedown_bed-f1.txt
Accelerometer-2012-06-07-10-49-17-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-32-58-climb_stairs-m6.txt
Accelerometer-2012-05-30-18-31-08-climb_stairs-f3.txt
Accelerometer-2011-05-30-08-39-09-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-43-14-climb_stairs-m6.txt
Accelerometer-2011-05-30-08-21-38-climb_stairs-f1.txt

Accelerometer-2011-03-29-09-55-46-climb_stairs-f1.txt
Accelerometer-2011-06-06-11-02-24-climb_stairs-f1.txt
Accelerometer-2011-05-30-10-32-53-climb_stairs-m1.txt
Accelerometer-2011-04-11-11-58-30-climb_stairs-f1.txt
Accelerometer-2012-06-06-08-59-53-climb_stairs-m5.txt
Accelerometer-2012-06-06-09-32-04-climb_stairs-m6.txt
Accelerometer-2012-05-30-22-06-17-climb_stairs-m2.txt
Accelerometer-2011-05-30-10-20-47-climb_stairs-m1.txt
Accelerometer-2012-06-06-09-06-49-climb_stairs-m5.txt
Accelerometer-2011-05-30-08-30-37-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-05-28-climb_stairs-m5.txt
Accelerometer-2011-05-30-21-36-58-climb_stairs-m2.txt
Accelerometer-2012-05-30-22-07-15-climb_stairs-m2.txt
Accelerometer-2012-06-06-14-05-18-climb_stairs-m7.txt
Accelerometer-2012-06-06-09-38-43-climb_stairs-m6.txt
Accelerometer-2011-06-06-11-00-50-climb_stairs-f1.txt
Accelerometer-2011-03-24-10-25-44-climb_stairs-f1.txt
Accelerometer-2012-06-07-10-53-34-climb_stairs-f1.txt
Accelerometer-2012-06-07-10-53-53-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-01-08-climb_stairs-m5.txt
Accelerometer-2011-04-11-11-44-35-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-43-47-climb_stairs-m6.txt
Accelerometer-2012-06-07-10-54-12-climb_stairs-f1.txt
Accelerometer-2012-06-06-14-08-44-climb_stairs-m7.txt
Accelerometer-2012-06-06-09-38-17-climb_stairs-m6.txt
Accelerometer-2012-05-30-18-32-56-climb_stairs-f3.txt
Accelerometer-2012-06-07-10-48-24-climb_stairs-f1.txt
Accelerometer-2011-05-30-09-43-37-climb_stairs-f1.txt
Accelerometer-2012-05-30-22-06-47-climb_stairs-m2.txt
Accelerometer-2012-05-30-19-12-19-climb_stairs-m4.txt
Accelerometer-2012-05-30-22-07-44-climb_stairs-m2.txt
Accelerometer-2012-05-30-18-33-57-climb_stairs-f3.txt
Accelerometer-2011-05-30-09-38-52-climb_stairs-f1.txt
Accelerometer-2011-06-02-10-39-21-climb_stairs-f1.txt
Accelerometer-2012-06-07-10-48-08-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-42-55-climb_stairs-m6.txt
Accelerometer-2011-05-31-16-32-44-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-00-24-climb_stairs-m5.txt
Accelerometer-2011-05-30-09-29-58-climb_stairs-f1.txt
Accelerometer-2011-05-31-15-06-32-climb_stairs-f1.txt
Accelerometer-2011-05-31-16-26-09-climb_stairs-f1.txt
Accelerometer-2011-05-30-21-46-05-climb_stairs-m2.txt
Accelerometer-2012-05-28-17-56-03-climb_stairs-m1.txt
Accelerometer-2011-06-06-10-57-43-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-37-58-climb_stairs-m6.txt
Accelerometer-2012-06-06-14-13-20-climb_stairs-m7.txt
Accelerometer-2011-05-30-10-41-10-climb_stairs-m1.txt
Accelerometer-2011-05-30-21-02-43-climb_stairs-f1.txt

Accelerometer-2011-04-05-18-21-22-climb_stairs-f1.txt
Accelerometer-2012-06-06-08-53-47-climb_stairs-m5.txt
Accelerometer-2012-06-06-08-54-29-climb_stairs-m5.txt
Accelerometer-2012-06-06-14-04-51-climb_stairs-m7.txt
Accelerometer-2012-06-06-09-06-28-climb_stairs-m5.txt
Accelerometer-2012-05-29-16-54-38-climb_stairs-f2.txt
Accelerometer-2011-03-24-10-24-39-climb_stairs-f1.txt
Accelerometer-2011-06-02-10-37-15-climb_stairs-f1.txt
Accelerometer-2011-06-06-10-57-19-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-44-02-climb_stairs-m6.txt
Accelerometer-2012-05-29-17-17-51-climb_stairs-m3.txt
Accelerometer-2011-05-31-15-20-50-climb_stairs-f1.txt
Accelerometer-2012-06-06-08-53-29-climb_stairs-m5.txt
Accelerometer-2011-05-31-14-58-41-climb_stairs-f1.txt
Accelerometer-2012-05-29-17-17-05-climb_stairs-m3.txt
Accelerometer-2012-05-30-19-12-57-climb_stairs-m4.txt
Accelerometer-2011-05-30-20-54-39-climb_stairs-f1.txt
Accelerometer-2011-06-02-10-40-10-climb_stairs-f1.txt
Accelerometer-2012-06-06-14-08-57-climb_stairs-m7.txt
Accelerometer-2011-04-11-11-57-50-climb_stairs-f1.txt
Accelerometer-2012-06-06-14-13-05-climb_stairs-m7.txt
Accelerometer-2012-05-30-22-08-15-climb_stairs-m2.txt
Accelerometer-2012-06-06-09-37-23-climb_stairs-m6.txt
Accelerometer-2012-06-06-14-09-12-climb_stairs-m7.txt
Accelerometer-2011-06-02-10-37-44-climb_stairs-f1.txt
Accelerometer-2011-06-06-11-01-27-climb_stairs-f1.txt
Accelerometer-2011-04-05-18-32-29-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-00-51-climb_stairs-m5.txt
Accelerometer-2012-05-30-18-31-52-climb_stairs-f3.txt
Accelerometer-2012-05-29-16-53-12-climb_stairs-f2.txt
Accelerometer-2012-06-06-08-54-08-climb_stairs-m5.txt
Accelerometer-2012-06-06-14-04-18-climb_stairs-m7.txt
Accelerometer-2012-06-06-14-05-05-climb_stairs-m7.txt
Accelerometer-2012-06-07-10-49-35-climb_stairs-f1.txt
Accelerometer-2012-05-30-19-14-51-climb_stairs-m4.txt
Accelerometer-2011-06-06-10-59-58-climb_stairs-f1.txt
Accelerometer-2012-06-06-14-12-49-climb_stairs-m7.txt
Accelerometer-2011-05-30-22-00-32-climb_stairs-m2.txt
Accelerometer-2012-06-06-09-33-15-climb_stairs-m6.txt
Accelerometer-2011-05-30-21-14-55-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-32-36-climb_stairs-m6.txt
Accelerometer-2012-05-28-17-56-40-climb_stairs-m1.txt
Accelerometer-2011-06-06-10-59-08-climb_stairs-f1.txt
Accelerometer-2012-06-06-09-06-03-climb_stairs-m5.txt
Accelerometer-2012-05-30-19-13-50-climb_stairs-m4.txt
Accelerometer-2012-06-06-14-12-35-climb_stairs-m7.txt
Accelerometer-2012-06-06-14-09-24-climb_stairs-m7.txt
Accelerometer-2012-06-07-10-54-29-climb_stairs-f1.txt

Accelerometer-2011-05-30-21-51-59-drink_glass-m2.txt
Accelerometer-2011-06-02-17-29-13-drink_glass-m1.txt
Accelerometer-2011-06-02-16-52-53-drink_glass-f4.txt
Accelerometer-2011-04-08-17-35-00-drink_glass-f3.txt
Accelerometer-2012-05-29-16-42-17-drink_glass-f2.txt
Accelerometer-2012-05-28-17-44-31-drink_glass-m1.txt
Accelerometer-2012-05-25-18-30-30-drink_glass-f4.txt
Accelerometer-2012-05-28-17-47-23-drink_glass-m1.txt
Accelerometer-2012-05-28-17-50-04-drink_glass-m1.txt
Accelerometer-2011-05-31-16-35-41-drink_glass-f1.txt
Accelerometer-2011-06-02-16-51-58-drink_glass-f4.txt
Accelerometer-2011-06-01-15-09-37-drink_glass-f1.txt
Accelerometer-2011-06-01-15-14-42-drink_glass-f1.txt
Accelerometer-2012-03-23-03-47-02-drink_glass-m9.txt
Accelerometer-2011-03-24-10-16-02-drink_glass-f1.txt
Accelerometer-2012-05-25-18-31-18-drink_glass-f4.txt
Accelerometer-2011-06-01-15-04-40-drink_glass-f1.txt
Accelerometer-2011-04-08-18-10-09-drink_glass-m4.txt
Accelerometer-2011-06-01-16-57-10-drink_glass-f1.txt
Accelerometer-2011-04-05-18-55-33-drink_glass-f1.txt
Accelerometer-2011-06-01-16-47-29-drink_glass-f1.txt
Accelerometer-2012-05-30-19-59-40-drink_glass-m3.txt
Accelerometer-2011-04-11-13-17-55-drink_glass-f1.txt
Accelerometer-2011-05-31-15-13-09-drink_glass-f1.txt
Accelerometer-2011-06-02-17-19-56-drink_glass-m1.txt
Accelerometer-2012-05-25-18-33-57-drink_glass-f4.txt
Accelerometer-2011-05-30-21-06-42-drink_glass-f1.txt
Accelerometer-2011-06-02-17-29-50-drink_glass-m1.txt
Accelerometer-2011-06-02-17-24-39-drink_glass-m1.txt
Accelerometer-2012-03-23-03-54-54-drink_glass-m9.txt
Accelerometer-2011-04-08-17-33-35-drink_glass-f3.txt
Accelerometer-2012-05-29-17-11-01-drink_glass-m3.txt
Accelerometer-2012-05-30-19-58-10-drink_glass-m3.txt
Accelerometer-2012-05-28-17-44-02-drink_glass-m1.txt
Accelerometer-2011-06-01-14-14-49-drink_glass-f1.txt
Accelerometer-2011-03-24-13-09-29-drink_glass-f1.txt
Accelerometer-2011-03-24-11-14-00-drink_glass-f1.txt
Accelerometer-2011-06-01-16-45-39-drink_glass-f1.txt
Accelerometer-2011-06-01-14-33-59-drink_glass-f1.txt
Accelerometer-2012-05-25-18-32-32-drink_glass-f4.txt
Accelerometer-2011-06-02-17-30-51-drink_glass-m1.txt
Accelerometer-2011-06-02-17-23-53-drink_glass-m1.txt
Accelerometer-2012-05-30-22-10-40-drink_glass-m2.txt
Accelerometer-2012-05-30-19-54-48-drink_glass-f2.txt
Accelerometer-2011-05-30-21-51-35-drink_glass-m2.txt
Accelerometer-2012-03-26-05-02-06-drink_glass-m3.txt
Accelerometer-2011-06-01-16-44-44-drink_glass-f1.txt
Accelerometer-2011-06-02-17-20-47-drink_glass-m1.txt

Accelerometer-2011-06-01-14-14-22-drink_glass-f1.txt
Accelerometer-2012-03-26-04-53-07-drink_glass-f2.txt
Accelerometer-2011-05-30-21-06-15-drink_glass-f1.txt
Accelerometer-2011-06-01-16-49-14-drink_glass-f1.txt
Accelerometer-2011-06-02-16-51-25-drink_glass-f4.txt
Accelerometer-2012-05-30-19-51-49-drink_glass-f2.txt
Accelerometer-2012-05-29-16-44-12-drink_glass-f2.txt
Accelerometer-2012-05-30-19-53-19-drink_glass-f2.txt
Accelerometer-2011-06-01-14-13-57-drink_glass-f1.txt
Accelerometer-2011-06-01-14-24-51-drink_glass-f1.txt
Accelerometer-2011-03-24-13-17-06-drink_glass-f1.txt
Accelerometer-2011-03-24-10-46-25-drink_glass-f1.txt
Accelerometer-2011-03-24-10-07-02-drink_glass-f1.txt
Accelerometer-2011-06-02-17-40-40-drink_glass-m1.txt
Accelerometer-2011-05-31-15-12-05-drink_glass-f1.txt
Accelerometer-2011-06-01-14-30-43-drink_glass-f1.txt
Accelerometer-2011-06-01-14-23-15-drink_glass-f1.txt
Accelerometer-2011-06-01-16-53-24-drink_glass-f1.txt
Accelerometer-2011-05-30-21-52-25-drink_glass-m2.txt
Accelerometer-2011-06-01-14-21-52-drink_glass-f1.txt
Accelerometer-2011-06-01-14-20-46-drink_glass-f1.txt
Accelerometer-2011-06-02-17-32-31-drink_glass-m1.txt
Accelerometer-2012-03-26-04-56-11-drink_glass-f2.txt
Accelerometer-2011-05-31-16-35-12-drink_glass-f1.txt
Accelerometer-2012-05-29-16-48-07-drink_glass-f2.txt
Accelerometer-2012-05-30-19-58-44-drink_glass-m3.txt
Accelerometer-2011-05-30-21-07-10-drink_glass-f1.txt
Accelerometer-2012-05-30-19-57-08-drink_glass-m3.txt
Accelerometer-2011-04-12-21-43-48-drink_glass-m8.txt
Accelerometer-2011-06-01-14-28-50-drink_glass-f1.txt
Accelerometer-2011-04-11-12-55-39-drink_glass-f1.txt
Accelerometer-2011-03-24-16-08-29-drink_glass-f2.txt
Accelerometer-2012-05-28-17-47-49-drink_glass-m1.txt
Accelerometer-2011-05-31-15-12-36-drink_glass-f1.txt
Accelerometer-2012-05-29-17-20-28-drink_glass-m3.txt
Accelerometer-2012-05-30-22-10-16-drink_glass-m2.txt
Accelerometer-2011-03-24-16-08-10-drink_glass-f2.txt
Accelerometer-2011-06-01-14-15-49-drink_glass-f1.txt
Accelerometer-2011-06-02-17-52-26-drink_glass-m1.txt
Accelerometer-2011-06-01-15-25-43-drink_glass-f1.txt
Accelerometer-2011-06-01-14-15-19-drink_glass-f1.txt
Accelerometer-2011-05-31-16-37-39-drink_glass-f1.txt
Accelerometer-2012-03-26-05-03-53-drink_glass-m3.txt
Accelerometer-2011-06-02-17-20-17-drink_glass-m1.txt
Accelerometer-2012-05-28-17-42-29-drink_glass-m1.txt
Accelerometer-2012-05-25-18-36-27-drink_glass-f4.txt
Accelerometer-2011-03-24-13-31-22-drink_glass-f1.txt
Accelerometer-2012-05-30-21-48-45-drink_glass-m2.txt

Accelerometer-2012-05-30-19-53-49-drink_glass-f2.txt
Accelerometer-2012-03-23-03-47-36-drink_glass-m9.txt
Accelerometer-2011-04-12-21-44-55-drink_glass-m8.txt
Accelerometer-2012-05-30-21-48-13-drink_glass-m2.txt
Accelerometer-2011-03-24-11-20-43-descend_stairs-f1.txt
Accelerometer-2011-06-02-10-36-42-descend_stairs-f1.txt
Accelerometer-2011-05-30-10-19-56-descend_stairs-m1.txt
Accelerometer-2011-05-31-15-00-30-descend_stairs-f1.txt
Accelerometer-2011-05-30-20-56-43-descend_stairs-f1.txt
Accelerometer-2011-05-30-08-24-58-descend_stairs-f1.txt
Accelerometer-2011-05-30-21-53-35-descend_stairs-m2.txt
Accelerometer-2011-06-06-10-58-14-descend_stairs-f1.txt
Accelerometer-2011-06-02-10-36-04-descend_stairs-f1.txt
Accelerometer-2011-06-06-11-01-54-descend_stairs-f1.txt
Accelerometer-2011-05-30-21-32-18-descend_stairs-m2.txt
Accelerometer-2011-04-11-11-51-27-descend_stairs-f1.txt
Accelerometer-2011-05-30-08-34-06-descend_stairs-f1.txt
Accelerometer-2011-03-24-10-24-02-descend_stairs-f1.txt
Accelerometer-2011-06-02-10-38-15-descend_stairs-f1.txt
Accelerometer-2011-05-30-09-31-43-descend_stairs-f1.txt
Accelerometer-2011-05-31-16-28-22-descend_stairs-f1.txt
Accelerometer-2011-05-30-09-29-15-descend_stairs-f1.txt
Accelerometer-2011-03-29-16-17-18-descend_stairs-f1.txt
Accelerometer-2011-06-06-10-56-55-descend_stairs-f1.txt
Accelerometer-2011-05-30-21-39-11-descend_stairs-m2.txt
Accelerometer-2011-06-06-10-59-38-descend_stairs-f1.txt
Accelerometer-2011-03-29-16-17-50-descend_stairs-f1.txt
Accelerometer-2011-05-30-08-20-55-descend_stairs-f1.txt
Accelerometer-2011-06-06-10-58-40-descend_stairs-f1.txt
Accelerometer-2011-05-31-14-52-31-descend_stairs-f1.txt
Accelerometer-2011-05-30-21-09-46-descend_stairs-f1.txt
Accelerometer-2011-05-30-09-40-50-descend_stairs-f1.txt
Accelerometer-2011-03-24-10-25-11-descend_stairs-f1.txt
Accelerometer-2011-06-06-11-00-26-descend_stairs-f1.txt
Accelerometer-2011-06-06-10-56-23-descend_stairs-f1.txt
Accelerometer-2011-06-02-10-38-52-descend_stairs-f1.txt
Accelerometer-2011-05-30-10-24-51-descend_stairs-m1.txt
Accelerometer-2011-05-30-20-48-10-descend_stairs-f1.txt
Accelerometer-2011-05-31-15-15-48-descend_stairs-f1.txt
Accelerometer-2011-05-30-10-37-30-descend_stairs-m1.txt
Accelerometer-2011-04-11-13-32-24-descend_stairs-f1.txt
Accelerometer-2011-03-29-16-18-14-descend_stairs-f1.txt
Accelerometer-2011-03-29-09-15-58-descend_stairs-f1.txt
Accelerometer-2011-05-31-16-21-49-descend_stairs-f1.txt
Accelerometer-2011-04-05-18-26-06-descend_stairs-f1.txt
Accelerometer-2011-03-29-16-16-34-descend_stairs-f1.txt
Accelerometer-2012-06-06-09-45-03-walk-m6.txt
Accelerometer-2011-04-11-11-55-57-walk-f1.txt

Accelerometer-2011-05-30-20-51-03-walk-f1.txt
Accelerometer-2012-06-06-08-57-26-walk-m5.txt
Accelerometer-2012-06-06-09-07-30-walk-m5.txt
Accelerometer-2012-06-06-14-10-02-walk-m7.txt
Accelerometer-2012-06-06-09-36-06-walk-m6.txt
Accelerometer-2012-06-06-09-45-38-walk-m6.txt
Accelerometer-2012-06-06-14-11-30-walk-m7.txt
Accelerometer-2012-06-07-10-57-45-walk-f1.txt
Accelerometer-2011-05-30-21-39-55-walk-m2.txt
Accelerometer-2012-05-30-18-29-02-walk-f3.txt
Accelerometer-2012-06-07-10-52-46-walk-f1.txt
Accelerometer-2012-06-06-14-15-57-walk-m7.txt
Accelerometer-2012-05-29-17-18-55-walk-m3.txt
Accelerometer-2011-05-30-21-44-35-walk-m2.txt
Accelerometer-2011-05-30-09-35-03-walk-f1.txt
Accelerometer-2012-06-06-09-46-31-walk-m6.txt
Accelerometer-2011-03-29-16-16-01-walk-f1.txt
Accelerometer-2011-05-31-16-32-12-walk-f1.txt
Accelerometer-2012-06-06-14-06-10-walk-m7.txt
Accelerometer-2012-05-29-16-51-40-walk-f2.txt
Accelerometer-2012-06-07-10-52-14-walk-f1.txt
Accelerometer-2012-06-06-09-47-07-walk-m6.txt
Accelerometer-2012-05-30-22-02-42-walk-m2.txt
Accelerometer-2012-05-30-22-03-03-walk-m2.txt
Accelerometer-2011-05-31-16-23-32-walk-f1.txt
Accelerometer-2012-06-07-10-50-09-walk-f1.txt
Accelerometer-2012-05-30-22-03-27-walk-m2.txt
Accelerometer-2012-05-30-22-03-52-walk-m2.txt
Accelerometer-2011-03-24-10-58-34-walk-f1.txt
Accelerometer-2012-06-06-08-59-00-walk-m5.txt
Accelerometer-2011-05-31-15-05-44-walk-f1.txt
Accelerometer-2012-06-06-14-12-00-walk-m7.txt
Accelerometer-2011-05-31-14-54-41-walk-f1.txt
Accelerometer-2012-05-29-17-15-15-walk-m3.txt
Accelerometer-2012-05-29-16-45-30-walk-f2.txt
Accelerometer-2012-05-30-22-04-20-walk-m2.txt
Accelerometer-2012-06-06-14-14-27-walk-m7.txt
Accelerometer-2012-06-11-11-39-29-walk-m1.txt
Accelerometer-2012-06-06-09-09-21-walk-m5.txt
Accelerometer-2012-06-06-14-15-25-walk-m7.txt
Accelerometer-2012-06-06-09-42-05-walk-m6.txt
Accelerometer-2011-04-05-18-30-57-walk-f1.txt
Accelerometer-2012-06-11-11-30-57-walk-m1.txt
Accelerometer-2012-06-06-09-04-41-walk-m5.txt
Accelerometer-2012-06-06-09-02-54-walk-m5.txt
Accelerometer-2012-06-11-11-37-36-walk-m1.txt
Accelerometer-2011-03-24-11-21-13-walk-f1.txt
Accelerometer-2012-05-29-17-13-45-walk-m3.txt

Accelerometer-2012-06-11-11-31-42-walk-m1.txt
Accelerometer-2011-05-30-21-01-39-walk-f1.txt
Accelerometer-2012-06-11-11-32-28-walk-m1.txt
Accelerometer-2011-05-30-10-29-28-walk-m1.txt
Accelerometer-2011-05-31-15-01-05-walk-f1.txt
Accelerometer-2012-06-07-10-55-33-walk-f1.txt
Accelerometer-2012-05-30-18-28-32-walk-f3.txt
Accelerometer-2012-05-30-18-29-35-walk-f3.txt
Accelerometer-2012-05-30-19-11-27-walk-m4.txt
Accelerometer-2012-05-30-19-09-54-walk-m4.txt
Accelerometer-2012-06-06-08-58-20-walk-m5.txt
Accelerometer-2012-06-06-09-41-32-walk-m6.txt
Accelerometer-2012-06-06-09-39-47-walk-m6.txt
Accelerometer-2012-06-11-11-36-25-walk-m1.txt
Accelerometer-2012-06-06-09-35-07-walk-m6.txt
Accelerometer-2012-06-07-10-57-12-walk-f1.txt
Accelerometer-2012-06-06-09-10-02-walk-m5.txt
Accelerometer-2012-06-11-11-23-05-walk-m1.txt
Accelerometer-2012-05-29-16-51-03-walk-f2.txt
Accelerometer-2011-03-24-09-51-07-walk-f1.txt
Accelerometer-2012-06-11-11-33-42-walk-m1.txt
Accelerometer-2012-06-06-08-56-33-walk-m5.txt
Accelerometer-2012-06-06-09-34-20-walk-m6.txt
Accelerometer-2012-05-30-18-30-08-walk-f3.txt
Accelerometer-2012-06-06-09-36-38-walk-m6.txt
Accelerometer-2012-06-06-09-40-33-walk-m6.txt
Accelerometer-2012-06-06-14-10-33-walk-m7.txt
Accelerometer-2012-05-29-17-16-24-walk-m3.txt
Accelerometer-2012-06-06-14-13-56-walk-m7.txt
Accelerometer-2012-06-06-09-02-06-walk-m5.txt
Accelerometer-2012-05-30-19-10-27-walk-m4.txt
Accelerometer-2012-06-11-11-37-01-walk-m1.txt
Accelerometer-2012-06-06-14-06-43-walk-m7.txt
Accelerometer-2012-06-07-10-50-42-walk-f1.txt
Accelerometer-2011-05-30-08-29-07-walk-f1.txt
Accelerometer-2012-06-11-11-33-07-walk-m1.txt
Accelerometer-2011-03-24-11-20-24-walk-f1.txt
Accelerometer-2012-05-30-19-10-56-walk-m4.txt
Accelerometer-2012-06-06-09-08-19-walk-m5.txt
Accelerometer-2012-06-06-09-03-57-walk-m5.txt
Accelerometer-2012-06-11-11-38-12-walk-m1.txt
Accelerometer-2012-06-11-11-38-52-walk-m1.txt
Accelerometer-2011-05-31-16-28-55-walk-f1.txt
Accelerometer-2012-05-29-16-46-02-walk-f2.txt
Accelerometer-2012-06-06-14-07-41-walk-m7.txt
Accelerometer-2012-06-11-11-34-18-walk-m1.txt
Accelerometer-2011-03-24-09-52-11-walk-f1.txt
Accelerometer-2011-05-30-21-34-15-walk-m2.txt

Accelerometer-2011-05-30-20-57-19-walk-f1.txt
Accelerometer-2012-06-06-14-08-12-walk-m7.txt

Lets write the dataf-rame to a file in “CSV” format, this will also take quite some time:

```
[9]: if Path(data_dir + data_csv).exists():  
      shutil.rmtree(data_dir + data_csv)  
  
[10]: df.write.option("header", "true").csv(data_dir + data_csv)
```

[Stage 0:===== (839 + 0) / 839]

Now we should have a CSV file with our contents

spark-csv-to-parquet

December 11, 2021

1 spark-csv-to-parquet

Converts a CSV file with header to parquet using ApacheSpark

```
[9]: %%bash
export version=`python --version |awk '{print $2}' |awk -F"." '{print $1$2}'`

echo $version

if [ $version == '36' ] || [ $version == '37' ]; then
    echo 'Starting installation...'
    pip3 install pyspark==2.4.8 wget==3.2 pyspark2pmml==0.5.1 > install.log 2>
    ↪install.log
    if [ $? == 0 ]; then
        echo 'Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear
    ↪All Outputs)'
    else
        echo 'Installation failed, please check log:'
        cat install.log
    fi
elif [ $version == '38' ] || [ $version == '39' ]; then
    pip3 install pyspark==3.1.2 wget==3.2 pyspark2pmml==0.5.1 > install.log 2>
    ↪install.log
    if [ $? == 0 ]; then
        echo 'Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear
    ↪All Outputs)'
    else
        echo 'Installation failed, please check log:'
        cat install.log
    fi
else
    echo 'Currently only python 3.6, 3.7 , 3.8 and 3.9 are supported, in case
    ↪you need a different version please open an issue at https://github.com/IBM/
    ↪claimed/issues'
    exit -1
fi
```

37

Starting installation...

Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear All Outputs)

```
[10]: from pyspark import SparkContext, SparkConf
      from pyspark.sql import SparkSession
      import os
      import sys
      import logging
      import re
```

```
[11]: # source path and file name (default: data.csv)
      data_csv = os.environ.get('data_csv', 'data.csv')

      # destination path and parquet file name (default: data.parquet)
      output_data_parquet = os.environ.get('output_data_parquet', 'data.parquet')

      # url of master (default: local mode)
      master = os.environ.get('master', "local[*]")

      # temporal data storage for local execution
      data_dir = os.environ.get('data_dir', '../..data/')
```

```
[12]: parameters = list(
      map(lambda s: re.sub('$', '', s),
      map(
          lambda s: s.replace('=', '='),
          filter(
              lambda s: s.find('=') > -1 and bool(re.match(r'[A-Za-z0-9_]*=[.
      ↪\A-Za-z0-9]*', s)),
          sys.argv
      )
      )))

      for parameter in parameters:
          logging.warning('Parameter: ' + parameter)
          exec(parameter)
```

```
[13]: skip = False

      if os.path.exists(data_dir + output_data_parquet):
          skip = True
```

```
[14]: if not skip:
      sc = SparkContext.getOrCreate(SparkConf().setMaster(master))
      spark = SparkSession.builder.getOrCreate()
```



```
[15]: if not skip:
      df = spark.read.option('header', 'true').csv(data_dir + data_csv)
```

```
[16]: if not skip:
      df.write.parquet(data_dir + output_data_parquet)
```

```
[Stage 2:> (0 + 16) /
27]21/12/10 15:52:04 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 93.14% for 8 writers
21/12/10 15:52:04 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 82.80% for 9 writers
21/12/10 15:52:04 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 74.52% for 10 writers
21/12/10 15:52:04 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 67.74% for 11 writers
21/12/10 15:52:04 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 62.10% for 12 writers
21/12/10 15:52:04 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 57.32% for 13 writers
21/12/10 15:52:04 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 53.23% for 14 writers
21/12/10 15:52:04 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 49.68% for 15 writers
21/12/10 15:52:04 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 46.57% for 16 writers
21/12/10 15:52:10 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 49.68% for 15 writers
21/12/10 15:52:10 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 53.23% for 14 writers
21/12/10 15:52:10 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 57.32% for 13 writers
21/12/10 15:52:10 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 62.10% for 12 writers
```

```

21/12/10 15:52:10 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 67.74% for 11 writers
21/12/10 15:52:10 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 74.52% for 10 writers
21/12/10 15:52:11 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 82.80% for 9 writers
[Stage 2:> (0 + 19) /
27]21/12/10 15:52:11 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 93.14% for 8 writers
[Stage 2:=====> (15 + 12) /
27]21/12/10 15:52:12 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 93.14% for 8 writers
21/12/10 15:52:12 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 82.80% for 9 writers
21/12/10 15:52:12 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 74.52% for 10 writers
21/12/10 15:52:13 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 67.74% for 11 writers
21/12/10 15:52:13 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 74.52% for 10 writers
21/12/10 15:52:13 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 67.74% for 11 writers
21/12/10 15:52:13 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 74.52% for 10 writers
[Stage 2:=====> (17 + 10) /
27]21/12/10 15:52:14 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 82.80% for 9 writers
21/12/10 15:52:14 WARN hadoop.MemoryManager: Total allocation exceeds 95.00%
(1,000,131,776 bytes) of heap memory
Scaling row group sizes to 93.14% for 8 writers

```

[]:

spark-train-lr

December 11, 2021

1 Spark Train Logistic Regression

Train Logistic Regression classifier with Apache SparkML

```
[ ]: %%%bash
export version=`python --version |awk '{print $2}' |awk -F"." '{print $1$2}'`

echo $version

if [ $version == '36' ] || [ $version == '37' ]; then
    echo 'Starting installation...'
    pip3 install pyspark==2.4.8 wget==3.2 pyspark2pmml==0.5.1 > install.log 2>
    ↪install.log
    if [ $? == 0 ]; then
        echo 'Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear
    ↪All Outputs)'
    else
        echo 'Installation failed, please check log:'
        cat install.log
    fi
elif [ $version == '38' ] || [ $version == '39' ]; then
    pip3 install pyspark==3.1.2 wget==3.2 pyspark2pmml==0.5.1 > install.log 2>
    ↪install.log
    if [ $? == 0 ]; then
        echo 'Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear
    ↪All Outputs)'
    else
        echo 'Installation failed, please check log:'
        cat install.log
    fi
else
    echo 'Currently only python 3.6, 3.7 , 3.8 and 3.9 are supported, in case
    ↪you need a different version please open an issue at https://github.com/IBM/
    ↪claimed/issues'
    exit -1
fi
```

37

Starting installation...

Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear All Outputs)

```
[18]: from pyspark import SparkContext, SparkConf, SQLContext

import os
from pyspark.ml.classification import RandomForestClassifier
from pyspark.ml import Pipeline
from pyspark.ml.evaluation import MulticlassClassificationEvaluator
from pyspark2pmml import PMMLBuilder
from pyspark.ml.feature import StringIndexer
from pyspark.ml.feature import VectorAssembler
from pyspark.ml.feature import MinMaxScaler
import logging
import shutil
import site
import sys
import wget
import re

[4]: if sys.version[0:3] == '3.9':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.7.2/'
           'jpmml-sparkml-executable-1.7.2.jar')
    wget.download(url)
    shutil.copy('jpmml-sparkml-executable-1.7.2.jar',
                site.getsitepackages()[0] + '/pyspark/jars/')
elif sys.version[0:3] == '3.8':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.7.2/'
           'jpmml-sparkml-executable-1.7.2.jar')
    wget.download(url)
    shutil.copy('jpmml-sparkml-executable-1.7.2.jar',
                site.getsitepackages()[0] + '/pyspark/jars/')
elif sys.version[0:3] == '3.7':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.5.12/'
           'jpmml-sparkml-executable-1.5.12.jar')
    wget.download(url)
elif sys.version[0:3] == '3.6':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.5.12/'
           'jpmml-sparkml-executable-1.5.12.jar')
    wget.download(url)
else:
    raise Exception('Currently only python 3.6 , 3.7, 3,8 and 3.9 is supported,
↳in case '
                    'you need a different version please open an issue at '
                    'https://github.com/IBM/claimed/issues')
```

```
[5]: data_parquet = os.environ.get('data_parquet',
                                   'data.parquet') # input file name (parquet)
master = os.environ.get('master',
                        "local[*]") # URL to Spark master
model_target = os.environ.get('model_target',
                              "model.xml") # model output file name
data_dir = os.environ.get('data_dir',
                          '../..data/') # temporary directory for data
input_columns = os.environ.get('input_columns',
                               '["x", "y", "z"]') # input columns to consider
```

```
[6]: parameters = list(
    map(lambda s: re.sub('$', '', s),
        map(
            lambda s: s.replace('=', '='),
            filter(
                lambda s: s.find('=') > -1 and bool(re.match(r'[A-Za-z0-9_]*=[.
↪\A-Za-z0-9]*', s)),
            sys.argv
        )
    )))

for parameter in parameters:
    logging.warning('Parameter: ' + parameter)
    exec(parameter)
```

```
[7]: conf = SparkConf().setMaster(master)
#if sys.version[0:3] == '3.6' or sys.version[0:3] == '3.7':
conf.set("spark.jars", 'jpmml-sparkml-executable-1.5.12.jar')

sc = SparkContext.getOrCreate(conf)
sqlContext = SQLContext(sc)
spark = sqlContext.sparkSession
```

21/12/11 14:23:14 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
Setting default log level to "WARN".
To adjust logging level use sc.setLogLevel(newLevel). For SparkR, use setLogLevel(newLevel).

```
[8]: df = spark.read.parquet(data_dir + data_parquet)
```

```
[9]: # register a corresponding query table
df.createOrReplaceTempView('df')
```

```
[10]: from pyspark.sql.types import DoubleType
df = df.withColumn("x", df.x.cast(DoubleType()))
df = df.withColumn("y", df.y.cast(DoubleType()))
df = df.withColumn("z", df.z.cast(DoubleType()))
```

```
[11]: splits = df.randomSplit([0.8, 0.2])
df_train = splits[0]
df_test = splits[1]
```

```
[12]: indexer = StringIndexer(inputCol="class", outputCol="label")

vectorAssembler = VectorAssembler(inputCols=eval(input_columns),
                                   outputCol="features")

normalizer = MinMaxScaler(inputCol="features", outputCol="features_norm")
```

```
[19]: lr = RandomForestClassifier(maxDepth=5, numTrees=20, subsamplingRate=1.0)
```

```
[20]: pipeline = Pipeline(stages=[indexer, vectorAssembler, normalizer, lr])
```

```
[21]: model = pipeline.fit(df_train)
```

```
[22]: prediction = model.transform(df_train)
```

```
[23]: binEval = MulticlassClassificationEvaluator(). \
    setMetricName("accuracy"). \
    setPredictionCol("prediction"). \
    setLabelCol("label")

binEval.evaluate(prediction)
```

```
[23]: 0.44228358091997
```

```
[ ]: pmmlBuilder = PMMLBuilder(sc, df_train, model)
pmmlBuilder.buildFile(data_dir + model_target)
```

```
[ ]: '/resources/labs/BD0231EN/claimed/component-library/train/../../data/model.xml'
```

```
[ ]:
```

spark-train-lr

December 11, 2021

1 Spark Train Logistic Regression

Train Logistic Regression classifier with Apache SparkML

```
[ ]: %%%bash
export version=`python --version |awk '{print $2}' |awk -F"." '{print $1$2}'`

echo $version

if [ $version == '36' ] || [ $version == '37' ]; then
    echo 'Starting installation...'
    pip3 install pyspark==2.4.8 wget==3.2 pyspark2pmml==0.5.1 > install.log 2>
    ↪install.log
    if [ $? == 0 ]; then
        echo 'Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear
    ↪All Outputs)'
    else
        echo 'Installation failed, please check log:'
        cat install.log
    fi
elif [ $version == '38' ] || [ $version == '39' ]; then
    pip3 install pyspark==3.1.2 wget==3.2 pyspark2pmml==0.5.1 > install.log 2>
    ↪install.log
    if [ $? == 0 ]; then
        echo 'Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear
    ↪All Outputs)'
    else
        echo 'Installation failed, please check log:'
        cat install.log
    fi
else
    echo 'Currently only python 3.6, 3.7 , 3.8 and 3.9 are supported, in case
    ↪you need a different version please open an issue at https://github.com/IBM/
    ↪claimed/issues'
    exit -1
fi
```

37

Starting installation...

Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear All Outputs)

```
[18]: from pyspark import SparkContext, SparkConf, SQLContext

import os
from pyspark.ml.classification import RandomForestClassifier
from pyspark.ml import Pipeline
from pyspark.ml.evaluation import MulticlassClassificationEvaluator
from pyspark2pmml import PMMLBuilder
from pyspark.ml.feature import StringIndexer
from pyspark.ml.feature import VectorAssembler
from pyspark.ml.feature import MinMaxScaler
import logging
import shutil
import site
import sys
import wget
import re

[4]: if sys.version[0:3] == '3.9':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.7.2/'
           'jpmml-sparkml-executable-1.7.2.jar')
    wget.download(url)
    shutil.copy('jpmml-sparkml-executable-1.7.2.jar',
                site.getsitepackages()[0] + '/pyspark/jars/')
elif sys.version[0:3] == '3.8':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.7.2/'
           'jpmml-sparkml-executable-1.7.2.jar')
    wget.download(url)
    shutil.copy('jpmml-sparkml-executable-1.7.2.jar',
                site.getsitepackages()[0] + '/pyspark/jars/')
elif sys.version[0:3] == '3.7':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.5.12/'
           'jpmml-sparkml-executable-1.5.12.jar')
    wget.download(url)
elif sys.version[0:3] == '3.6':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.5.12/'
           'jpmml-sparkml-executable-1.5.12.jar')
    wget.download(url)
else:
    raise Exception('Currently only python 3.6 , 3.7, 3,8 and 3.9 is supported,
↳in case '
                    'you need a different version please open an issue at '
                    'https://github.com/IBM/claimed/issues')
```



```
[5]: data_parquet = os.environ.get('data_parquet',
                                   'data.parquet') # input file name (parquet)
master = os.environ.get('master',
                        "local[*]") # URL to Spark master
model_target = os.environ.get('model_target',
                              "model.xml") # model output file name
data_dir = os.environ.get('data_dir',
                          '../..data/') # temporary directory for data
input_columns = os.environ.get('input_columns',
                               '["x", "y", "z"]') # input columns to consider
```

```
[6]: parameters = list(
    map(lambda s: re.sub('$', '', s),
        map(
            lambda s: s.replace('=', '='),
            filter(
                lambda s: s.find('=') > -1 and bool(re.match(r'[A-Za-z0-9_]*=[.
↪\A-Za-z0-9]*', s)),
            sys.argv
        )
    )))

for parameter in parameters:
    logging.warning('Parameter: ' + parameter)
    exec(parameter)
```

```
[7]: conf = SparkConf().setMaster(master)
      #if sys.version[0:3] == '3.6' or sys.version[0:3] == '3.7':
      conf.set("spark.jars", 'jpmml-sparkml-executable-1.5.12.jar')

      sc = SparkContext.getOrCreate(conf)
      sqlContext = SQLContext(sc)
      spark = sqlContext.sparkSession
```

21/12/11 14:23:14 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
Setting default log level to "WARN".
To adjust logging level use sc.setLogLevel(newLevel). For SparkR, use setLogLevel(newLevel).

```
[8]: df = spark.read.parquet(data_dir + data_parquet)
```

```
[9]: # register a corresponding query table
      df.createOrReplaceTempView('df')
```

```
[10]: from pyspark.sql.types import DoubleType
df = df.withColumn("x", df.x.cast(DoubleType()))
df = df.withColumn("y", df.y.cast(DoubleType()))
df = df.withColumn("z", df.z.cast(DoubleType()))
```

```
[11]: splits = df.randomSplit([0.8, 0.2])
df_train = splits[0]
df_test = splits[1]
```

```
[12]: indexer = StringIndexer(inputCol="class", outputCol="label")

vectorAssembler = VectorAssembler(inputCols=eval(input_columns),
                                   outputCol="features")

normalizer = MinMaxScaler(inputCol="features", outputCol="features_norm")
```

```
[24]: lr = RandomForestClassifier(maxDepth=5, numTrees=10, subsamplingRate=1.0)
```

```
[25]: pipeline = Pipeline(stages=[indexer, vectorAssembler, normalizer, lr])
```

```
[26]: model = pipeline.fit(df_train)
```

```
[27]: prediction = model.transform(df_train)
```

```
[28]: binEval = MulticlassClassificationEvaluator(). \
    setMetricName("accuracy"). \
    setPredictionCol("prediction"). \
    setLabelCol("label")

binEval.evaluate(prediction)
```

```
[28]: 0.4388972226264707
```

```
[ ]: pmmlBuilder = PMMLBuilder(sc, df_train, model)
pmmlBuilder.buildFile(data_dir + model_target)
```

```
[ ]: '/resources/labs/BD0231EN/claimed/component-library/train/../../data/model.xml'
```

```
[ ]:
```

spark-train-lr

December 11, 2021

1 Spark Train Logistic Regression

Train Logistic Regression classifier with Apache SparkML

```
[ ]: %%%bash
export version=`python --version |awk '{print $2}' |awk -F"." '{print $1$2}'`

echo $version

if [ $version == '36' ] || [ $version == '37' ]; then
    echo 'Starting installation...'
    pip3 install pyspark==2.4.8 wget==3.2 pyspark2pmml==0.5.1 > install.log 2>
    ↪install.log
    if [ $? == 0 ]; then
        echo 'Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear
    ↪All Outputs)'
    else
        echo 'Installation failed, please check log:'
        cat install.log
    fi
elif [ $version == '38' ] || [ $version == '39' ]; then
    pip3 install pyspark==3.1.2 wget==3.2 pyspark2pmml==0.5.1 > install.log 2>
    ↪install.log
    if [ $? == 0 ]; then
        echo 'Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear
    ↪All Outputs)'
    else
        echo 'Installation failed, please check log:'
        cat install.log
    fi
else
    echo 'Currently only python 3.6, 3.7 , 3.8 and 3.9 are supported, in case
    ↪you need a different version please open an issue at https://github.com/IBM/
    ↪claimed/issues'
    exit -1
fi
```

37

Starting installation...

Please <<RESTART YOUR KERNEL>> (Kernel->Restart Kernel and Clear All Outputs)

```
[18]: from pyspark import SparkContext, SparkConf, SQLContext

import os
from pyspark.ml.classification import RandomForestClassifier
from pyspark.ml import Pipeline
from pyspark.ml.evaluation import MulticlassClassificationEvaluator
from pyspark2pmml import PMMLBuilder
from pyspark.ml.feature import StringIndexer
from pyspark.ml.feature import VectorAssembler
from pyspark.ml.feature import MinMaxScaler
import logging
import shutil
import site
import sys
import wget
import re

[4]: if sys.version[0:3] == '3.9':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.7.2/'
           'jpmml-sparkml-executable-1.7.2.jar')
    wget.download(url)
    shutil.copy('jpmml-sparkml-executable-1.7.2.jar',
                site.getsitepackages()[0] + '/pyspark/jars/')
elif sys.version[0:3] == '3.8':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.7.2/'
           'jpmml-sparkml-executable-1.7.2.jar')
    wget.download(url)
    shutil.copy('jpmml-sparkml-executable-1.7.2.jar',
                site.getsitepackages()[0] + '/pyspark/jars/')
elif sys.version[0:3] == '3.7':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.5.12/'
           'jpmml-sparkml-executable-1.5.12.jar')
    wget.download(url)
elif sys.version[0:3] == '3.6':
    url = ('https://github.com/jpmml/jpmml-sparkml/releases/download/1.5.12/'
           'jpmml-sparkml-executable-1.5.12.jar')
    wget.download(url)
else:
    raise Exception('Currently only python 3.6 , 3.7, 3,8 and 3.9 is supported,
↳ in case '
                    'you need a different version please open an issue at '
                    'https://github.com/IBM/claimed/issues')
```

```
[5]: data_parquet = os.environ.get('data_parquet',
                                   'data.parquet') # input file name (parquet)
master = os.environ.get('master',
                        "local[*]") # URL to Spark master
model_target = os.environ.get('model_target',
                              "model.xml") # model output file name
data_dir = os.environ.get('data_dir',
                          '../..data/') # temporary directory for data
input_columns = os.environ.get('input_columns',
                               '["x", "y", "z"]') # input columns to consider
```

```
[6]: parameters = list(
    map(lambda s: re.sub('$', '', s),
        map(
            lambda s: s.replace('=', '='),
            filter(
                lambda s: s.find('=') > -1 and bool(re.match(r'[A-Za-z0-9_]*=[.
↪\A-Za-z0-9]*', s)),
            sys.argv
        )
    )))

for parameter in parameters:
    logging.warning('Parameter: ' + parameter)
    exec(parameter)
```

```
[7]: conf = SparkConf().setMaster(master)
#if sys.version[0:3] == '3.6' or sys.version[0:3] == '3.7':
conf.set("spark.jars", 'jpmml-sparkml-executable-1.5.12.jar')

sc = SparkContext.getOrCreate(conf)
sqlContext = SQLContext(sc)
spark = sqlContext.sparkSession
```

21/12/11 14:23:14 WARN util.NativeCodeLoader: Unable to load native-hadoop library for your platform... using builtin-java classes where applicable
Setting default log level to "WARN".
To adjust logging level use sc.setLogLevel(newLevel). For SparkR, use setLogLevel(newLevel).

```
[8]: df = spark.read.parquet(data_dir + data_parquet)
```

```
[9]: # register a corresponding query table
df.createOrReplaceTempView('df')
```

```
[10]: from pyspark.sql.types import DoubleType
df = df.withColumn("x", df.x.cast(DoubleType()))
df = df.withColumn("y", df.y.cast(DoubleType()))
df = df.withColumn("z", df.z.cast(DoubleType()))
```

```
[11]: splits = df.randomSplit([0.8, 0.2])
df_train = splits[0]
df_test = splits[1]
```

```
[12]: indexer = StringIndexer(inputCol="class", outputCol="label")

vectorAssembler = VectorAssembler(inputCols=eval(input_columns),
                                   outputCol="features")

normalizer = MinMaxScaler(inputCol="features", outputCol="features_norm")
```

```
[29]: lr = RandomForestClassifier(maxDepth=7, numTrees=20, subsamplingRate=1.0)
```

```
[30]: pipeline = Pipeline(stages=[indexer, vectorAssembler, normalizer, lr])
```

```
[31]: model = pipeline.fit(df_train)
```

```
[32]: prediction = model.transform(df_train)
```

```
[33]: binEval = MulticlassClassificationEvaluator(). \
    setMetricName("accuracy"). \
    setPredictionCol("prediction"). \
    setLabelCol("label")

binEval.evaluate(prediction)
```

```
[33]: 0.4640682197270763
```

```
[ ]: pmmlBuilder = PMMLBuilder(sc, df_train, model)
pmmlBuilder.buildFile(data_dir + model_target)
```

```
[ ]: '/resources/labs/BD0231EN/claimed/component-library/train/../../data/model.xml'
```

```
[ ]:
```