

# Ejercicios de RDDs

## Lectura de archivos

### 1. Lee todos los archivos de texto de un directorio en un único RDD.

- En Scala:

```
import org.apache.spark.sql.SparkSession
```

```
// Crear una SparkSession
val spark = SparkSession.builder
  .appName("LecturaArchivos")
  .getOrCreate()
```

```
// Leer los archivos de texto en el directorio especificado
val rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/txts/*")
val data = rdd.collect()
data.foreach(println)
```

► (1) Spark Jobs

```

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d dui posuere blandit.
import org.apache.spark.sql.SparkSession
spark: org.apache.spark.sql.SparkSession = org.apache.spark.sql.SparkSession@5280cf07
rdd: org.apache.spark.rdd.RDD[String] = /FileStore/tables/Practica_RDDs/txts/* MapPartitionsRDD[11] at textFile at command-3449726824910705:9
data: Array[String] = Array("Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.", "Ut eni
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am id dui posuere blandit.")
```

- En Python:

En vez de crear, se asigna la SparkSession “LecturaArchivos”, creada anteriormente.

```
%python
from pyspark.sql import SparkSession
```

```
spark = SparkSession.builder.appName("LecturaArchivos").getOrCreate()
rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/txts/*")
data = rdd.collect()
for i in data:
    print(i)
```

► (1) Spark Jobs

```

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Vestibulum ac diam sit amet quam vehicula elementum sed sit amet dui. Pellentesque in ipsum id orci porta dapibus. Curabitur non nulla sit amet nisl tempus convall
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d dui posuere blandit.
```

### 2. Lee varios archivos de texto en un solo RDD.

Se leen los archivos de texto y se combinan en un solo RDD.

- En Scala

Se leen los archivos de texto y se combinan en un solo RDD.

```
//Las variables en scala (val) son inmutables y no se pueden reasignar. El valor de la variable es global en el notebook pero solo con ese valor determinado.
```

```
val rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/txts/TextFile1_txt.txt,/FileStore/tables/Practica_RDDs/txts/TextFile2_txt.txt")
val data = rdd.collect()
data.foreach(println)
```

```

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d dui posuere blandit.
```

- En Python

No hace falta importar from pyspark.sql porque ya se ha importado antes

```
%python
rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/txts/TextFile1_txt.txt,/FileStore/tables/Practica_RDDs/txts/TextFile2_txt.txt")
data = rdd.collect()
for i in data:
    print(i)
```

▶ (1) Spark Jobs

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### 3. Lee todos los archivos de texto que coinciden con un patrón.

Leo todos los archivos de texto que acaben en .txt

- En Scala

```
val rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/txts/*.txt")
val data = rdd.collect()
data.foreach(println)
```

▶ (1) Spark Jobs

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum. Vestibulum ac diam sit amet quam vehicula elementum sed sit amet dui. Pellentesque in ipsum id orci porta dapibus. Curabitur non nulla sit amet nisl tempus convallis quis ac lectus. Curabitur arcu erat, accumsan id imperdiet et, porttitor at sem. Vivamus suscipit tortor eget felis porttitor volutpat. Curabitur aliquet quam id dui posuere blandit.

rdd: org.apache.spark.rdd.RDD[String] = /FileStore/tables/Practica\_RDDs/txts/\*.txt MapPartitionsRDD[33] at textFile at command-4335281140898157:1

data: Array[String] = Array("Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. ", "Ut enim ad minim veniam, quis nostrud exercitation ullamco ", "laboris nisi ut aliquip ex ea commodo consequat. ", "Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore ", eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in, n culpa qui officia deserunt mollit anim id est laborum m., Vestibulum ac diam sit amet quam vehicula elementum sed sit amet dui. Pellentesque in ipsum id orci porta dapibus. Curabitur non nulla sit amet nisl tempus convallis quis ac lectus. Curabitur arcu erat, accumsan id imperdiet et, porttitor at sem. Vivamus suscipit tortor eget felis porttitor volutpat. Curabitur aliquet quam id dui posuere blandit.")

- En Python

```
%python
rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/txts/*.txt")
data = rdd.collect()
for i in data:
    print(i)
```

▶ (1) Spark Jobs

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#### 4. Lee archivos de varios directorios en un solo RDD.

- En Scala.

```
val rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/txts/*,/FileStore/tables/Practica_RDDs/csvs/*")
val data = rdd.collect()
data.foreach(println)
```

(1) Spark Jobs

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T07,"Enrollment in primary, lower secondary and upper secondary education levels",,,,,,Region/Country/Area,,Year,Series,Value,Footnotes,Source

1,"Total, all countries or areas",2005,Students enrolled in primary education (thousands),"678,907",Estimate.,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2005,Gross enrollment ratio - Primary (male),104.5,Estimate.,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2005,Gross enrollment ratio - Primary (female),99.7,,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2005,Students enrolled in lower secondary education (thousands),"309,665",,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2005,Gross enrollment ratio - Lower secondary level (male),80.7,,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2005,Gross enrollment ratio - Lower secondary level (female),76.7,,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2005,Students enrolled in upper secondary education (thousands),"199,767",,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2005,Gross enrollment ratio - Upper secondary level (male),51.2,,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2005,Gross enrollment ratio - Upper secondary level (female),48.3,,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2010,Students enrolled in primary education (thousands),"697,253",,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2010,Gross enrollment ratio - Primary (male),104.0,,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2010,Gross enrollment ratio - Primary (female),101.3,,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2010,Students enrolled in lower secondary education (thousands),"315,613",,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2010,Gross enrollment ratio - Lower secondary level (male),83.6,,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2010,Gross enrollment ratio - Lower secondary level (female),81.3,,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2010,Students enrolled in upper secondary education (thousands),"230,863",,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

1,"Total, all countries or areas",2010,Gross enrollment ratio - Upper secondary level (male),61.0,,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

- En Python

No hace falta importar from pyspark.sql porque ya se ha importado antes

```
%python
rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/txts/*,/FileStore/tables/Practica_RDDs/csvs/*")
data = rdd.collect()
for i in data:
    print(i)
```

(1) Spark Jobs

722,SIDS,2015,Population aged 60+ years old (percentage),11.2,,,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision; supplemented by data from the United Nations Statistics Division, New York, Demographic Yearbook 2021 and Secretariat for the Pacific Community (SPC) for small countries or areas, last accessed July 2022."

722,SIDS,2015,Population density,58.5,,,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision, last accessed July 2022."

722,SIDS,2022,Population mid-year estimates (millions),74.36,Projected estimate (medium fertility variant),,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision, last accessed July 2022."

722,SIDS,2022,Population mid-year estimates for males (millions),37.44,Projected estimate (medium fertility variant),,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision, last accessed July 2022."

722,SIDS,2022,Population mid-year estimates for females (millions),36.92,Projected estimate (medium fertility variant),,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision, last accessed July 2022."

722,SIDS,2022,Sex ratio (males per 100 females),101.4,Projected estimate (medium fertility variant),,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision; supplemented by data from the United Nations Statistics Division, New York, Demographic Yearbook 2021 and Secretariat for the Pacific Community (SPC) for small countries or areas, last accessed July 2022."

722,SIDS,2022,Population aged 0 to 14 years old (percentage),25.0,Projected estimate (medium fertility variant),,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision; supplemented by data from the United Nations Statistics Division, New York, Demographic Yearbook 2021 and Secretariat for the Pacific Community (SPC) for small countries or areas, last accessed July 2022."

722,SIDS,2022,Population aged 60+ years old (percentage),13.3,Projected estimate (medium fertility variant),,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision; supplemented by data from the United Nations Statistics Division, New York, Demographic Yearbook 2021 and Secretariat for the Pacific Community (SPC) for small countries or areas, last accessed July 2022."

722,SIDS,2022,Population density,62.4,Projected estimate (medium fertility variant),,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision, last accessed July 2022."

#### 5. Lectura de archivos de texto de directorios anidados en un único RDD.

Leo todos los archivos de texto de directorios anidados en un único RDD.

- En Scala

Leo todos los archivos de texto en el directorio específico y sus subdirectorios. “\*\*/\*” me asegura que se incluyan todos los archivos en los subdirectorios.

```
val rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/**/*")
val data = rdd.collect()
data.foreach(println)
```

(1) Spark Jobs

T07,"Enrollment in primary, lower secondary and upper secondary education levels",,,,,,Region/Country/Area,,Year,Series,Value,Footnotes,Source1,"Total, all countries or areas",2005,Students enrolled in primary education (thousands),"678,907",Estimate.,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

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st accessed July 2022."716,Zimbabwe,2010,Population aged 0 to 14 years old (percentage),43.2,,,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision; supplemented by data from the United Nations Statistics Division, New York, Demographic Yearbook 2021 and Secretariat for the Pacific Community (SPC) for small countries or areas, last accessed July 2022."

data: Array[String] = Array(T07,"Enrollment in primary, lower secondary and upper secondary education levels",,,,,, Region/Country/Area,,Year,Series,Value,Footnotes,Source1,"Total, all countries or areas",2005,Students enrolled in primary education (thousands),"678,907",Estimate.,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),

## - En Python

```
%python
rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/**/*")
data = rdd.collect()
for i in data:
    print(i)
```

▶ (1) Spark Jobs

York, World Population Prospects: The 2022 Revision, last accessed July 2022."  
722,SIDS,2022,Sex ratio (males per 100 females),101.4,Projected estimate (medium fertility variant).,"United Nations Population Division, New York, World Populat  
ion Prospects: The 2022 Revision; supplemented by data from the United Nations Statistics Division, New York, Demographic Yearbook 2021 and Secretariat for the P  
acific Community (SPC) for small countries or areas, last accessed July 2022."  
722,SIDS,2022,Population aged 0 to 14 years old (percentage),25.0,Projected estimate (medium fertility variant).,"United Nations Population Division, New York, W  
orld Population Prospects: The 2022 Revision; supplemented by data from the United Nations Statistics Division, New York, Demographic Yearbook 2021 and Secretari  
at for the Pacific Community (SPC) for small countries or areas, last accessed July 2022."  
722,SIDS,2022,Population aged 60+ years old (percentage),13.3,Projected estimate (medium fertility variant).,"United Nations Population Division, New York, World  
Population Prospects: The 2022 Revision; supplemented by data from the United Nations Statistics Division, New York, Demographic Yearbook 2021 and Secretariat fo  
r the Pacific Community (SPC) for small countries or areas, last accessed July 2022."  
722,SIDS,2022,Population density,62.4,Projected estimate (medium fertility variant).,"United Nations Population Division, New York, World Population Prospects: T  
he 2022 Revision, last accessed July 2022."  
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eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt i

## 6. Lectura de varios archivos csv en RDD.

### - En Scala

```
val rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/csvs/Population_csv.csv,/FileStore/tables/Practica_RDDs/csvs/Population_csv.csv")
val data = rdd.collect()
data.foreach(println)
```

▶ (1) Spark Jobs

T02,"Population, density and surface area",,,,,  
Region/Country/Area,Year,Series,Value,Footnotes,Source  
1,"Total, all countries or areas",2010,Population mid-year estimates (millions),"6,985.60",,"United Nations Population Division, New York, World Population Prospe  
1,"Total, all countries or areas",2010,Population mid-year estimates for males (millions),"3,514.41",,"United Nations Population Division, New York, World Populat  
1,"Total, all countries or areas",2010,Population mid-year estimates for females (millions),"3,471.20",,"United Nations Population Division, New York, World Popul  
1,"Total, all countries or areas",2010,Sex ratio (males per 100 females),101.2,,"United Nations Population Division, New York, World Population Prospects: The 202  
1,"Total, all countries or areas",2010,Population aged 0 to 14 years old (percentage),27.1,,"United Nations Population Division, New York, World Population Prospe  
1,"Total, all countries or areas",2010,Population aged 60+ years old (percentage),11.1,,"United Nations Population Division, New York, World Population Prospects:  
1,"Total, all countries or areas",2010,Population density,53.6,,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision, last  
1,"Total, all countries or areas",2015,Population mid-year estimates (millions),"7,426.60",,"United Nations Population Division, New York, World Population Prospe  
1,"Total, all countries or areas",2015,Population mid-year estimates for males (millions),"3,737.40",,"United Nations Population Division, New York, World Populat  
1,"Total, all countries or areas",2015,Population mid-year estimates for females (millions),"3,689.19",,"United Nations Population Division, New York, World Popul  
1,"Total, all countries or areas",2015,Sex ratio (males per 100 females),101.3,,"United Nations Population Division, New York, World Population Prospects: The 202  
1,"Total, all countries or areas",2015,Population aged 0 to 14 years old (percentage),26.4,,"United Nations Population Division, New York, World Population Prospe  
1,"Total, all countries or areas",2015,Population aged 60+ years old (percentage),12.3,,"United Nations Population Division, New York, World Population Prospects:  
1,"Total, all countries or areas",2015,Population density,57.0,,"United Nations Population Division, New York, World Population Prospects: The 2022 Revision, last  
1,"Total, all countries or areas",2021,Population mid-year estimates (millions),"7,909.30",,"United Nations Population Division, New York, World Population Prospe  
1,"Total, all countries or areas",2021,Population mid-year estimates for males (millions),"3,976.65",,"United Nations Population Division, New York, World Populat

### - En Python

```
%python
rdd = spark.sparkContext.textFile("/FileStore/tables/Practica_RDDs/csvs/Population_csv.csv,/FileStore/tables/Practica_RDDs/csvs/Population_csv.csv")
data = rdd.collect()
for i in data:
    print(i)
```

▶ (1) Spark Jobs

ntreal, the UNESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."  
722,SIDS,2015,Gross enrollment ratio - Upper secondary level (female),60.3,Estimate,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),  
Montreal, the UNESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."  
722,SIDS,2020,Students enrolled in primary education (thousands),"8,377",Estimate,,"United Nations Educational, Scientific and Cultural Organization (UNESCO), Mo  
ntreal, the UNESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."  
722,SIDS,2020,Gross enrollment ratio - Primary (male),121.0,Estimate,,"United Nations Educational, Scientific and Cultural Organization (UNESCO), Montreal, the U  
NESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."  
722,SIDS,2020,Gross enrollment ratio - Primary (female),117.8,Estimate,,"United Nations Educational, Scientific and Cultural Organization (UNESCO), Montreal, the  
UNESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."  
722,SIDS,2020,Students enrolled in lower secondary education (thousands),"2,734",Estimate,,"United Nations Educational, Scientific and Cultural Organization (UNE  
SCO), Montreal, the UNESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."  
722,SIDS,2020,Gross enrollment ratio - Lower secondary level (male),76.5,Estimate,,"United Nations Educational, Scientific and Cultural Organization (UNESCO), Mo  
ntreal, the UNESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."  
722,SIDS,2020,Gross enrollment ratio - Lower secondary level (female),74.8,Estimate,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),  
Montreal, the UNESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."  
722,SIDS,2020,Students enrolled in upper secondary education (thousands),"1,890",Estimate,,"United Nations Educational, Scientific and Cultural Organization (UNE  
SCO), Montreal, the UNESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."  
722,SIDS,2020,Gross enrollment ratio - Upper secondary level (male),56.1,Estimate,,"United Nations Educational, Scientific and Cultural Organization (UNESCO), Mo  
ntreal, the UNESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."  
722,SIDS,2020,Gross enrollment ratio - Upper secondary level (female),59.4,Estimate,,"United Nations Educational, Scientific and Cultural Organization (UNESCO),  
Montreal, the UNESCO Institute for Statistics (UIS) statistics database, last accessed April 2023."