esProc

Innovated data computing engine

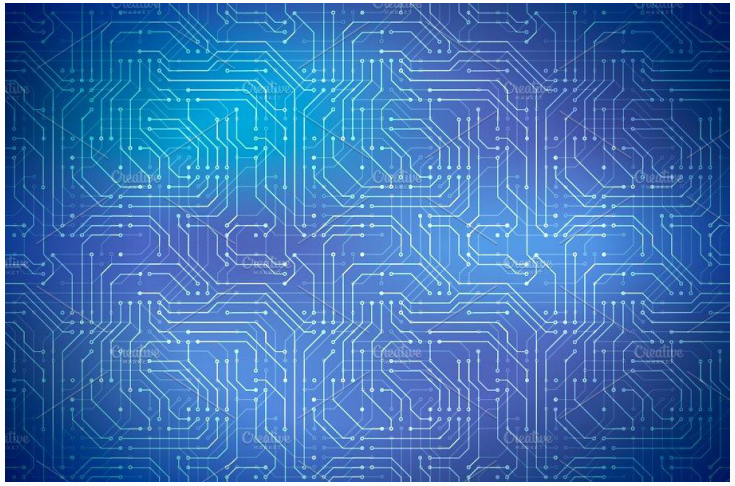
Professional data computing package for JAVA

Issued by Raqsoft

Data Computing in Java Programs

For various reasons, we often need to compute data sets in Java programs.

Data is scattered among different data sources



Computing logic is complex and it is difficult to implement in SQL.

According to system design requirements, business logic is separated from data storage.

A JAVA example to implement grouping

```
public static void groupCount(){
    groupBy mainJava = new groupBy();
    List<MainBean> list = mainJava.initList();
    List<MainBean> mainList = new ArrayList<MainBean>();
    Map<String, MainBean> map = new HashMap<String, MainBean>();
    MainBean totalBean = null;
    String employeeId = null;
    for(MainBean mainBean : list) {
        employeeId = mainBean.getEmployeeId();
        if (!map.containsKey(employeeId)) {
            totalBean = new MainBean();
            totalBean.setEmployeeId(employeeId);
            totalBean.setBuyNum(mainBean.getBuyNum());
            totalBean.setGoodsPrice(mainBean.getGoodsPrice());
            totalBean.setTotalBuyNum(mainBean.getTotalBuyNum());
            totalBean.setFreight(mainBean.getFreight());
            totalBean.setTotalGoodsPrice(mainBean.getGoodsPrice() * mainBean.getBuyNum());
            totalBean.setTotalPrice(mainBean.getGoodsPrice() * mainBean.getBuyNum() + mainBean.getFreight());
            mainList.add(totalBean);
            map.put(employeeId, totalBean);
        } else {
            totalBean = map.get(employeeId);
            totalBean.setTotalBuyNum(totalBean.getTotalBuyNum() + mainBean.getTotalBuyNum());
            totalBean.setFreight(totalBean.getFreight() + mainBean.getFreight());
            totalBean.setTotalGoodsPrice(totalBean.getTotalGoodsPrice() + mainBean.getGoodsPrice() * mainBean.getBuyNum());
            totalBean.setTotalPrice(totalBean.getTotalPrice() +
                    mainBean.getGoodsPrice() * mainBean.getBuyNum() + mainBean.getFreight());
        }
    }
```

Is that all right?

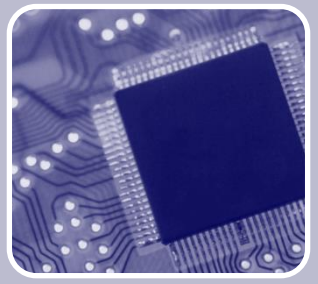
This code only implements basic single field grouping and single field aggregation.

Without considering----------

Advanced grouping conditions

Complex computing logic

Large data volume



Memory optimization

Multithread concurrency

Multiple Data Source Interface

Exception handler

The Pain Points of Implementing Data Computing in Java

Uncertain performance

Stability is not guaranteed

Code quality is uncontrollable

Large amount of code and long development cycle

Solution: Java Professional Computing Package - esProc

Professional Data Computing Language SPL

- Combination of discreetness and set orientation
- More than 300 Structured Computing Functions
- Characteristic cell-style coding makes layer clear
- Memory, External Storage Cursor, Cluster Operation
- Loop and Branch Adapts Procedural Computation
- Step-by-step calculation and perfect debugging function

Abundant data interfaces

- RDB：Oracle,DB2,MS SQL,MySQL,PG,….
- MongoDB，REDIS，…
- Hadoop：HDFS，HIVE，HBASE
- TXT/CSV，JSON/XML，EXCEL
- HTTP、ALI-OTS
- File SQL interface

Professional Jar packages

- Standard JAR package, easy to integrate
- Multithread Parallel Computing
- Perfect exception handling

Examples of implementing grouping with SPL

Such simple operation can also be written directly in SQL :

SELECT name,count(name) FROM user/test/duty.xlsx GROUP BY name

Conventional grouping

Summarize the number of days on duty for each person

	A
1	=file("/Users/test/duty.xlsx").importxls@tx()
2	=A1.groups(name;count(name):count)

Top N of each group

Obtain overtime records for each month, each person, and the first three days

	A
1	=file("/Users/test/duty.xlsx").importxls@tx()
2	=A1.group(month(workday):mon,name;~.top(3):top3)

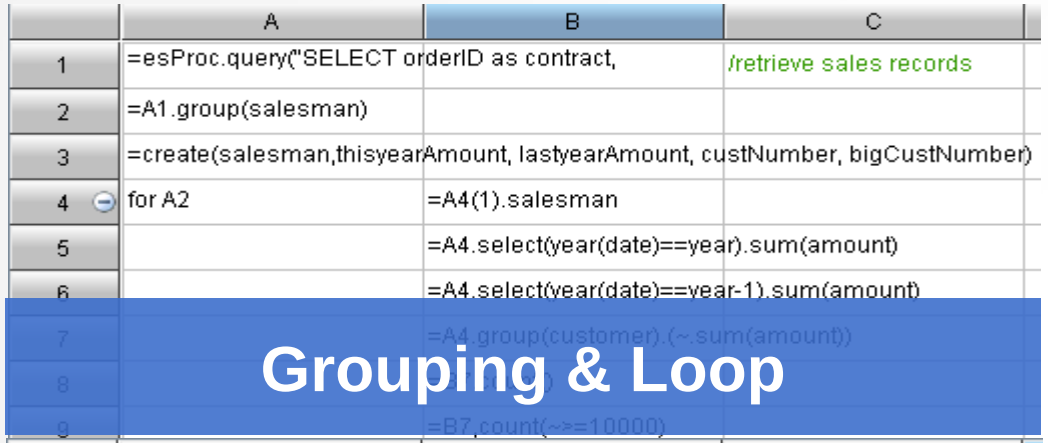
Alignment grouping

List in order the number of countries using Chinese, English and French as official languages

	A
1	=connect("mysql")
2	=A1.query@x("select * from world.countrylanguage where isofficial='T'")
3	[Chinese,English,French]
4	=A2.align@a(A3,Language)
5	=A4.new(A3(#):name, ~.len():cnt)

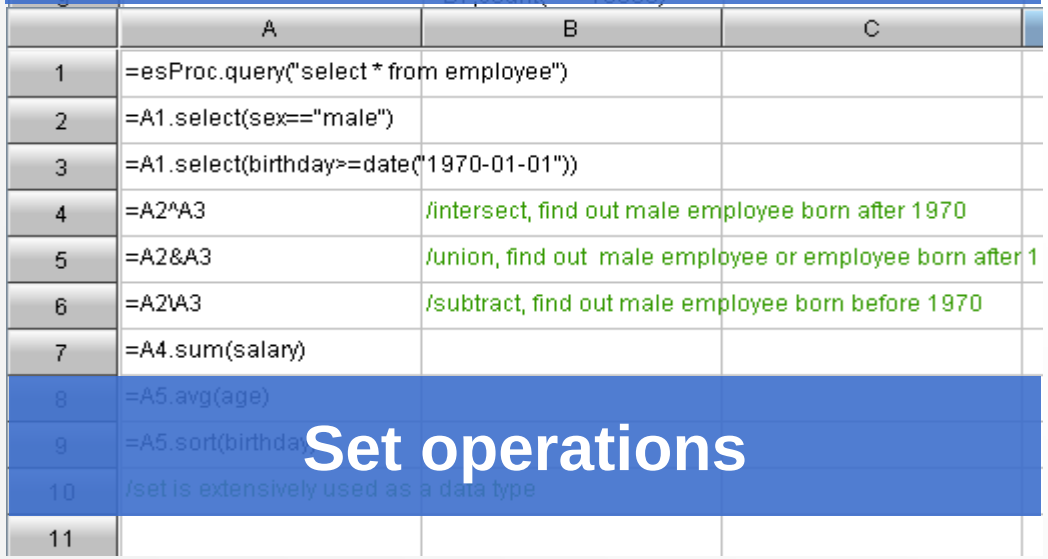
Rich class library

Intended for structured data processing



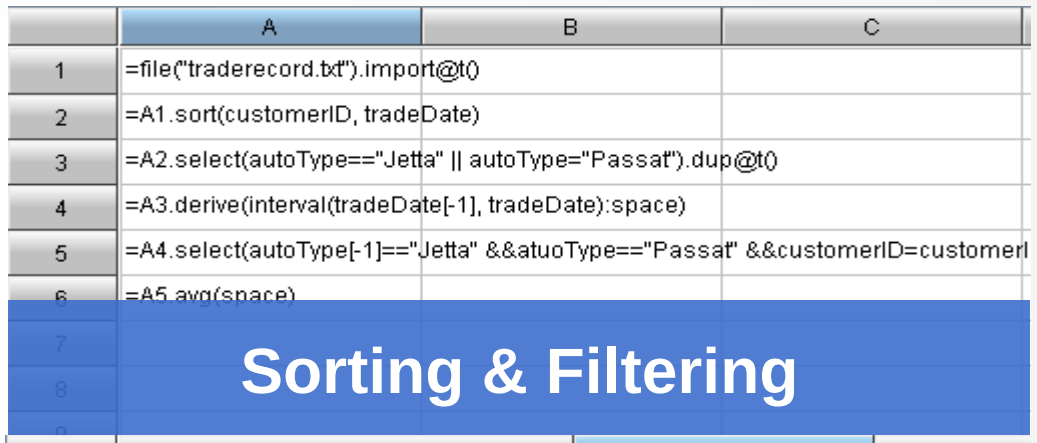
	A	B	C
1	=esProc.query("SELECT orderID as contract,		/retrieve sales records
2	=A1.group(salesman)		
3	=create(salesman,thisyearAmount, lastyearAmount, custNumber, bigCustNumber)		
4	for A2	=A4(1).salesman	
5		=A4.select(year(date)==year).sum(amount)	
6		=A4.select(year(date)==year-1).sum(amount)	
7		=A4.group(customer).(~.sum(amount))	
8			
9		=B7.count(~>=10000)	

Grouping & Loop



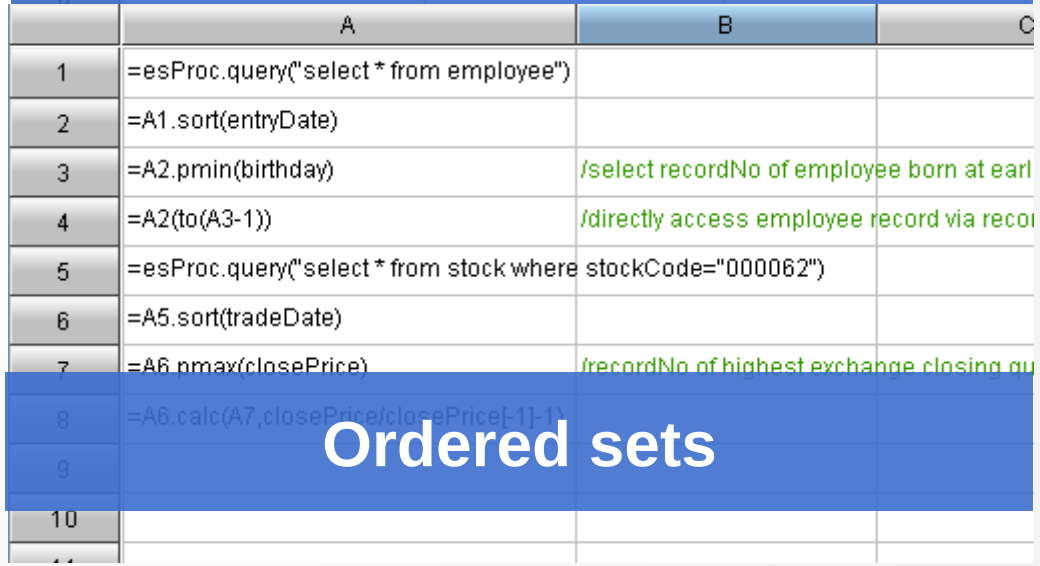
	A	B	C
1	=esProc.query("select * from employee")		
2	=A1.select(sex=="male")		
3	=A1.select(birthday>=date("1970-01-01"))		
4	=A2^A3	/intersect, find out male employee born after 1970	
5	=A2&A3	/union, find out male employee or employee born after 1	
6	=A2\A3	/subtract, find out male employee born before 1970	
7	=A4.sum(salary)		
8	=A5.avg(age)		
9	=A5.sort(birthday)		
10	/set is extensively used as a data type		
11			

Set operations



	A	B	C
1	=file("traderecord.txt").import@t()		
2	=A1.sort(customerID, tradeDate)		
3	=A2.select(autoType=="Jetta" || autoType="Passat").dup@t()		
4	=A3.derive(interval(tradeDate[-1], tradeDate):space)		
5	=A4.select(autoType[-1]=="Jetta" &&atuoType=="Passat" &&customerID=customerI		
6	=A5.avg(space)		
7			
8			

Sorting & Filtering



	A	B	C
1	=esProc.query("select * from employee")		
2	=A1.sort(entryDate)		
3	=A2.pmin(birthday)	/select recordNo of employee born at earl	
4	=A2(to(A3-1))	/directly access employee record via reco	
5	=esProc.query("select * from stock where	stockCode="000062")	
6	=A5.sort(tradeDate)		
7	=A6.pmax(closePrice)	/recordNo of highest exchange closing qu	
8	=A6.calc(A7,closePrice/closePrice[-1]-1)		
9			
10			

Ordered sets

Standard invocation interface

Java codes:

```
...
Connection con = null;
Class.forName("com.esproc.jdbc.InternalDriver");
con= DriverManager.getConnection("jdbc:esproc:local://");
// Calling stored procedures , CountName is the file name of dfx
st =(com. esproc.jdbc.InternalCStatement)con.prepareCall("call CountName()");
// Execute stored procedures
st.execute();
// Get  result set
ResultSet rs = st.getResultSet();
...
```

Application Development Promotion by esProc

* Extended reading： http://c.raqsoft.com.cn/article/1566120108

Innovation makes progress!