# PostgreSQL and Java Stream – Complete Reference Notes

## 1. Table Definitions

CREATE TABLE BANK\_BRANCH (  
 BCODE VARCHAR(10) PRIMARY KEY,  
 BNAME VARCHAR(100),  
 CITY VARCHAR(50)  
);  
  
CREATE TABLE ACCOUNT\_TYPE (  
 TYPE\_ID INT PRIMARY KEY,  
 TYPE\_NAME VARCHAR(50)  
);  
  
CREATE TABLE ACCOUNT (  
 ACC\_NO INT PRIMARY KEY,  
 CUST\_NAME VARCHAR(100),  
 BALANCE DECIMAL(10, 2),  
 BCODE VARCHAR(10),  
 TYPE\_ID INT,  
 FOREIGN KEY (BCODE) REFERENCES BANK\_BRANCH(BCODE),  
 FOREIGN KEY (TYPE\_ID) REFERENCES ACCOUNT\_TYPE(TYPE\_ID)  
);

## 2. Java Stream Example – Grouping with Counting

import java.util.Arrays;  
import java.util.List;  
import java.util.Map;  
import java.util.function.Function;  
import java.util.stream.Collectors;  
  
public class IntQuest1x {  
 public static void main(String[] args) {  
 System.out.println("IntQuest1x");  
  
 List<String> listStr = Arrays.asList(  
 "ew", "swg", "pwx4", "ew", "pwx4", "swg", "swg", "pwx4", "pwx4"  
 );  
  
 listStr.stream().forEach(x -> System.out.println(x));  
  
 Map<String, Long> collect = listStr.stream()  
 .collect(Collectors.groupingBy(Function.identity(), Collectors.counting()));  
  
 System.out.println(collect);  
 }  
}

## 3. Advanced PostgreSQL CTE Examples

### 1. Branch-wise Account Type Summary

Show how many accounts of each type exist in every branch.

WITH AccountTypeCounts AS (  
 SELECT   
 BB.BNAME,  
 AT.TYPE\_NAME,  
 COUNT(\*) AS TOTAL\_ACCOUNTS  
 FROM ACCOUNT A  
 JOIN BANK\_BRANCH BB ON A.BCODE = BB.BCODE  
 JOIN ACCOUNT\_TYPE AT ON A.TYPE\_ID = AT.TYPE\_ID  
 GROUP BY BB.BNAME, AT.TYPE\_NAME  
)  
SELECT \*   
FROM AccountTypeCounts  
ORDER BY BNAME, TYPE\_NAME;

### 2. Top 3 Branches by Total Balance

Find the top 3 branches ranked by the sum of their account balances.

WITH BranchBalances AS (  
 SELECT   
 BB.BNAME,  
 SUM(A.BALANCE) AS TOTAL\_BALANCE  
 FROM BANK\_BRANCH BB  
 LEFT JOIN ACCOUNT A ON BB.BCODE = A.BCODE  
 GROUP BY BB.BNAME  
),  
RankedBranches AS (  
 SELECT \*,  
 RANK() OVER (ORDER BY TOTAL\_BALANCE DESC) AS BAL\_RANK  
 FROM BranchBalances  
)  
SELECT \*   
FROM RankedBranches  
WHERE BAL\_RANK <= 3;

### 3. Branches with No 'Current' Accounts

List all branches that do not have any accounts of type 'Current'.

WITH BranchWithCurrent AS (  
 SELECT DISTINCT A.BCODE  
 FROM ACCOUNT A  
 JOIN ACCOUNT\_TYPE AT ON A.TYPE\_ID = AT.TYPE\_ID  
 WHERE AT.TYPE\_NAME = 'Current'  
)  
SELECT BB.BNAME  
FROM BANK\_BRANCH BB  
LEFT JOIN BranchWithCurrent BWC ON BB.BCODE = BWC.BCODE  
WHERE BWC.BCODE IS NULL;

### 4. Total Balance and Account Count Per Account Type

Aggregate balances and account counts grouped by account type.

WITH TypeSummary AS (  
 SELECT   
 AT.TYPE\_NAME,  
 COUNT(A.ACC\_NO) AS TOTAL\_ACCOUNTS,  
 SUM(A.BALANCE) AS TOTAL\_BALANCE  
 FROM ACCOUNT A  
 JOIN ACCOUNT\_TYPE AT ON A.TYPE\_ID = AT.TYPE\_ID  
 GROUP BY AT.TYPE\_NAME  
)  
SELECT \* FROM TypeSummary;

### 5. Branches Where Average Balance > Overall Average

Show branches whose average account balance is above the global average.

WITH BranchAvg AS (  
 SELECT   
 BB.BNAME,  
 AVG(A.BALANCE) AS BRANCH\_AVG  
 FROM BANK\_BRANCH BB  
 JOIN ACCOUNT A ON BB.BCODE = A.BCODE  
 GROUP BY BB.BNAME  
),  
OverallAvg AS (  
 SELECT AVG(BALANCE) AS ALL\_AVG FROM ACCOUNT  
)  
SELECT BA.\*  
FROM BranchAvg BA, OverallAvg OA  
WHERE BA.BRANCH\_AVG > OA.ALL\_AVG;

### 6. Customers Holding Multiple Account Types

Identify customers who hold more than one type of account.

WITH TypeCountPerCustomer AS (  
 SELECT   
 CUST\_NAME,  
 COUNT(DISTINCT TYPE\_ID) AS TYPE\_COUNT  
 FROM ACCOUNT  
 GROUP BY CUST\_NAME  
)  
SELECT \*   
FROM TypeCountPerCustomer  
WHERE TYPE\_COUNT > 1;