**2)**

Class MAPPER

Method MAP(docid a, doc d1, docid b, doc d2)

For all term t1 ϵ doc d1 do

For all term t2 ϵ doc d2 do

IF t1.key == t2.key then EMIT(t1.value, t2.value)

Class REDUCER

Method REDUCE(term t1, term t2)

For all Distinct(t1, t2)

EMIT(t1, t2)

**3)**

**package** ICE4  
**import** org.apache.spark.{SparkConf, SparkContext}  
**object** ICE4 {  
 **def** main(args : Array[String]){  
 // administration  
 System.*setProperty*("hadoop.home.dir", "C:\\winutils")  
 **val** config = **new** SparkConf()  
 .setAppName("ICE4")  
 .setMaster("local[\*]")  
 **val** sc = **new** SparkContext(config)  
 // read in data  
 **val** textTransaction = sc.textFile("src/main/scala/ICE4/input\_transaction.txt")  
 **val** textUser = sc.textFile("src/main/scala/ICE4/input\_user.txt")  
 // map transactions  
 **val** result = textTransaction.map(x => (x.split(", ")(2),x.split(", ")(1)))  
 // map users to transactions  
 .join(textUser.map(x => (x.split(", ")(0),x.split(", ")(3))))  
 // reduce to distinct values  
 .values.distinct()  
 // output results  
 result.saveAsTextFile("src/main/scala/ICE4/output")  
 }  
}