class Mapper

method Map(docid a; doc d)

for all term u in record r do

for all term v in Window(u) do

Emit((u, \*), 1)

Emit((u, v), 1)

class Reducer

grandTotal = 0

method Reduce(Pair (item1, item2), Integer [c1, c2, …])

total = 0

for all count c in counts [c1, c2, …] do

total++

if (v == “\*”)

grandTotal = total

else

Emit((item1, item2), grandTotal / total)

class Mapper

method Map(docid a; doc d)

for all term u in record r do

m = new AssociativeArray

for all term v in Window(u) do

m{v} = m{v} + 1 .

Emit(u, m)

class Reducer

method Reduce(u, [m1,m2,m3, …])

grandTotal = 0;

fm = new AssociativeArray

for all stripe m in [m1;m2;m3; …] do

fm = fm + m //Element-wise addition

grandTotal = Sum(fm) // Sum of all elements in fm

for all entry e in fm do

Emit(u, e.getValue() / grandTotal)