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```
Map() { // input is table 1 and table 2
  for each tuple (Name, ID, Department, Cumulative Credit attained) in table1 {
        value = Cumulative Credit
        emit (Name, value) //pair1
  }
  for each tuple( Name, Department , Age) in table2
        value = Department
        emit ( Name, Department) //pair 2
  }

Reduce ( key, value list) {
        a=0
        b=0
        c=[]
        d=[]
  for i in pair1 {
      for j in pair2 {
          if j. key == i.key and j.value == 'comp':
                a+= i. value
                c.append(j)

          if j. key == i-key and j. value == 'EE':
                b+= i.value
                d.append(j)
      }
  print ("total credits of EE is", b, "credit from", d)
  print("total credits of Comp is", a, "credit from", c )
}
```

In terme diate result:

mapper 1
(Tom, 3)
(Jone, 6)
(Lucy, 3)
(Jack, 9)

mapper 2
(Terry, 15)
(philip, 6)
(sophia, 18)

mapper 3
(Jone, comp)
(Jack, comp)
(Sara, EZE)
(Terry, EZE)

mapper 4
(Bob, comp)
(Sophia, EZE)
(Jerry, EZE)

Input of reducer 1
(Jone, comp)
(Jack, comp)
(Bob, comp)
(Jone, 6)
(Jack, 9)

Input of reducer 2
(Sara, EZE)
(Terry, EZE)
(Sophia, EZE)
(Jerry, EZE)
(Terry, 15)
(Sophia, 18)

output of reducer 1
(comp, 15)
9 from Jack,
6 from Jone

out put of reducer 2
(EZE, 33)
15 from Terry
18 from Sophia

Q2: choose P_2 and P_5 as centers

$D(1,2) = \sqrt{5}$ $\quad D(1,5) = \sqrt{181} \Rightarrow P_2$

$D(2,2) = 0$ $\quad D(2,5) = \sqrt{128} \Rightarrow P_2$ } group1

$D(3,2) = \sqrt{5}$ $\quad D(3,5) = \sqrt{117} \Rightarrow P_2$

$D(4,2) = \sqrt{85}$ $\quad D(4,5) = \sqrt{5} \Rightarrow P_5$

$D(5,2) = \sqrt{128}$ $\quad D(5,5) = 0 \Rightarrow P_5$ } group2.

$D(6,2) = \sqrt{106}$ $\quad D(6,5) = \sqrt{0} \Rightarrow P_5$

The center of P_1, P_2, P_3 is $(\frac{4}{3}, 1)$

The center of P_4, P_5, P_6 is $(8, \frac{25}{3})$

recalute find still P_1, P_2, P_3 in same group

and, P_4, P_5, P_6 is in same group

(2) $P_1 = 4.81$

$P_2 = \sqrt{25 + (5 - \frac{25}{3})^2} > 4.81$

So Z belong to group1