There are 2 mappers and 3 reducers in my HW. 2 reducers use the same mapper (different reducers since there are two modes for execution).  
  
Pattern for sim mode:

1. PairCreatorMapper  
  
PairCreatorMapper gets rid of repetition in a line, creates pairs and assigns 1 for each distinctive pair. So, for example in HW

1 mother dad love

2 family tree

3 draw family tree

4 family mother love tree

It creates pairs

((dad, love), 1)  
((dad, mother), 1)

((love, mother), 1)

((family, tree), 1)

((draw, family), 1)

((draw, tree), 1)

((family, tree), 1)

((family, love), 1)

((family, mother), 1)

((family, tree), 1)

((love, mother), 1)

((love, tree), 1)

((mother, tree), 1)

2. SWReducer

SWReducer takes pairs from PairCreationMapper, then it sums similar pairs  
  
((dad, love), 1)

((dad, mother), 1)

((love, mother), 2)

((family, tree), 3)

((draw, family), 1)

((draw, tree), 1)

((family, love), 1)

((family, mother), 1)

((love, tree), 1)

((mother, tree), 1)

and takes only pairs with value > k, so for k = 2 edited output is

(love, mother) 2

(family, tree) 3

(order may be different)

Pattern for hist mode:

1. PairCreatorMapper (explained above)

2. PairCreatorReducer

PairCreator Reducer does the same as SWReducer but output is formatted differently (without brackets for pairs). It then saves output into a temporary file which will be deleted in the end in main function.

3. WSHMapper

WSHMapper takes only sums from PairCreatorReducer output file and assigns 1 to each sum  
  
(1, 1)

(1, 1)

(2, 1)

(3, 1)

(1, 1)

(1, 1)

(1, 1)

(1, 1)

(1, 1)

(1, 1)

4. WSHReducer

WSHReducer takes pairs form WSHMapper and sums similar sums, then outputs to a file.  
  
1, 8

2, 1

3, 1