1. Input:

The dog saw John in the park
The little bear saw the fine fat trout in the rocky brook.

a) Map Vs Flat Map

Map:

```
[ The
  dog
  saw
  John
  in
  the
  park ]

[ The
  little
  bear
  saw
  the
  fine
  flat
  trout
  in
  the
  rocky
  brook ]
```

Flat Map

```
[ The
  dog
  saw
  John
  in
  the
  park
  The
  little
  bear
  saw
  the
  fine
  trout
  in
  the
  rocky
  brook ]
```

b. Map Reduce :

Input:

The dog saw John in the park
the little bear saw the fine
fat trout in the rockey brook

Splitting:

The dog saw John in the park

The little bear saw the fine
fat trout in the rockey brook

Mapping:

The, 2
dog, 1
saw, 1
John, 1
in, 1
Park, 1

The, 3
little, 1
bear, 1
saw, 1
fine, 1
trout, 1
in, 1
rocky, 1
brook, 1

Shuffling:

The, 2
the, 3

dog, 1

Saw, 1
Saw, 1

John, 1

in, 1
in, 1

Park, 1

little, 1

bear, 1

fine, 1

trout, 1

rocky, 1

brook, 1

the, 5

dog, 1

saw, 2

John, 1

in, 2

park, 1

little, 1

bear, 1

fine, 1

trout, 1

rocky, 1

brook, 1

Reducing / Final result:

the, 5
dog, 1
saw, 2
John, 1
in, 2
Park, 1
little, 1
bear, 1
fine, 1
trout, 1
rocky, 1
brook, 1

Group by starting letter

Input

The dog saw John in the park

The little bear saw the fine fat trout in the rocky brook

Mapping

T, the, 1
d, dog, 1
S, saw, 1
J, John, 1
i, in, 1
t, the, 1
P, park, 1

T, the, 1
l, little, 1
b, bear, 1
S, saw, 1
t, the, 1
f, fine, 1
f, fat, 1
t, trout, 1
i, in, 1
t, the, 1
r, rocky, 1
b, brook, 1

Shuffling

T, the, 1
T, the, 1
T, the, 1
T, the, 1
T, the, 1
T, the, 1
T, trout, 1

d, dog, 1

S, saw, 1
S, saw, 1

J, John, 1

i, in, 1
i, in, 1

P, park, 1

l, little, 1

b, bear, 1
b, brook, 1

f, fine, 1
f, fat, 1

r, rocky, 1

Reducing

T, the, the, the, the, the, trout, 6

d, dog, 1

S, saw, 2

J, John, 1

i, in, 2

P, park, 1

l, little, 1

b, bear, brook, 2

f, fine, fat, 2

r, rocky, 1

Final Result

T, the, the, the, the, the, trout, 6

d, dog, 1

S, saw, 2

J, John, 1

i, in, 2

P, park, 1

l, little, 1

b, bear, brook, 2

f, fine, fat, 2

r, rocky, 1