MapReduce of Palindromes

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Problem

Given a set of given text documents, the goal is to find frequencies of palindromes in these documents. What is a palindrome? In a simple definition, a palindrome is a word that reads the same backward as forward, e.g., "madam" or refer".

Python function is_palindrome()

Python program to check if a string is palindrome or not. Given a string, we write a python function to check if it is palindrome or not. A string is said to be palindrome if the reverse of the string is the same as string. For example, "radar" is a palindrome, but "radix" is not a palindrome.

```
# Python-dode:
# Find reverse of string
# Check if reverse and original are same or not.
# function which return reverse of a string
def is_palindrome(s):
  if s is None: return False
  #
  return s == s[::-1]
#end-def
```

Sample Input

```
today level ok dont civic madam is madam
tomorrow level madam civic yes level
there is no palindromes in this record except madam
```

Mapper

```
# pseudo-dode:
# assume that k is a record number of input file, ignored
# assume that v is the entire input record
map(k, v) {
    #split input record by space
    words = v.split(" ")
    for (w in words) {
        if(is_palindrome(w)) {
            # w is a palindrome
            emit(w, 1)
        }
    }
}
```

Output of Mappers

```
(level, 1)
(civic, 1)
(madam, 1)
(madam, 1)
(level, 1)
(madam, 1)
(civic, 1)
(level, 1)
(madam, 1)
```

Output of Sort and Shuffle

```
(level, [1, 1, 1])
(civic, [1, 1])
(madam, [1, 1, 1, 1])
```

Reducer

```
# pseudo-dode:
# key is a unique palindrome
# values is an Iterable<Integer>
reduce(key, values) {
    count = 0
    for(v : values) {
        #sum of count of palindrome words
        count += v
    }
    # now, output the final count for a palindrome
    # return palindrome & its total count as output
    emit(key, count)
}
```

Output of Reducers

```
(level,3)
(civic,2)
(madam,4)
```

Question-1: Write a combiner for this MapReduce

Question-2: How do you prove that your combiner is correct?