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24

We can solve this problem by mapping each `string` in `strings` to a `key` in a `hashmap`. We then return `hashmap.values()`.



```
{
  (1, 1): ['abc', 'bcd', 'xyz'],
  (2, 2, 1): ['acef'],
  (25,): ['az', 'ba'],
  (): ['a', 'z']
}
```

- The key can be represented as a tuple of the "differences" between adjacent characters. Characters map to integers (e.g. `ord('a') = 97`). For example, 'abc' maps to `(1,1)` because `ord('b') - ord('a') = 1` and `ord('c') - ord('b') = 1`
- We need to watch out for the "wraparound" case - for example, 'az' and 'ba' should map to the same "shift group" as `a + 1 = b` and `z + 1 = a`. Given the above point, the respective tuples would be `(25,)` (`122 - 97`) and `(-1,)` (`79 - 80`) and `az` and `ba` would map to different groups. This is incorrect.
- To account for this case, we add 26 to the difference between letters (smallest difference possible is -25, `za`) and mod by 26. So, `(26 + 122 - 97) % 26` and `(26 + 79 - 80) % 26` both equal `(25,)`

```
def groupStrings(self, strings: List[str]) -> List[List[str]]:
    hashmap = {}
    for s in strings:
        key = ()
        for i in range(len(s) - 1):
            circular_difference = 26 + ord(s[i+1]) - ord(s[i])
            key += (circular_difference % 26,)
        hashmap[key] = hashmap.get(key, []) + [s]
    return list(hashmap.values())
```

- Time complexity would be $O(ab)$ where `a` is the total number of strings and `b` is the length of the longest string in `strings`.
- Space complexity would be $O(n)$, as the most space we would use is the space required for `strings` and the keys of our hashmap.

23 / 23 test cases passed.

Status: Accepted

Runtime: 44 ms

Memory Usage: 13.1 MB

hashmap

python

dict

tuple

easy-to-understand

python 3