CSE222 HW7 Report

Elifnur Kabalcı 1801042617

	Best	Average	Worst	My project
Merge sort	O(n log n)	O(n log n)	O(n log n)	O(n log n)
Selection Sort	O(n^2)	O(n^2)	O(n^2)	O(n^2)
Insertion Sort	O(n)	O(n^2)	O(n^2)	O(n^2)
Bubble Sort	O(n)	O(n^2)	O(n^2)	O(n^2)
Quick Sort	O(n log n)	O(n log n)	O(n^2)	O(n log n)

➔ I made these tests:
Buzzing bees buzz.
'Hush, hush!' whispered the rushing wind.
See you Later Alligator! <3

->Time

Test1)

```
Merge Sort Time: 19668499 nanoseconds
Selection Sort Time: 14081501 nanoseconds
Insertion Sort Time: 14818300 nanoseconds
Bubble Sort Time: 14861100 nanoseconds
Quick Sort Time: 13223599 nanoseconds
```

Quick Sort < Selection Sort < Insertion Sort < Bubble Sort < Merge Sort

Test2)

```
Merge Sort Time: 20215701 nanoseconds
Selection Sort Time: 23481000 nanoseconds
Insertion Sort Time: 21120101 nanoseconds
Bubble Sort Time: 18621801 nanoseconds
Quick Sort Time: 17332201 nanoseconds
```

Quick Sort < Bubble Sort < Merge Sort < Insertion Sort < Selection Sort

Test3)

```
Merge Sort Time: 20093600 nanoseconds
Selection Sort Time: 63642599 nanoseconds
Insertion Sort Time: 30134800 nanoseconds
Bubble Sort Time: 15695999 nanoseconds
Quick Sort Time: 13093300 nanoseconds
```

Quick Sort < Bubble Sort < Merge Sort < Insertion Sort < Selection Sort

Every situation, quick sort is the best algorithm for my test cases.

➔ Equal Count Values

Since I think that those with the same count value should be ordered according to the order of addition, I prepared my algorithm accordingly while writing the code. so all my algorithms respected the rankings. In the part where the sorting operation is performed, which provides this effect, I used the if part and the greater or lesser expressions. They remained in the fixed order as they did not change on the equality condition.

ScreenShots:

Test1)

```
Enter a string: Buzzing bees buzz.
Merge Sort
Original String:     Buzzing bees buzz.
Preprocessed String: buzzing bees buzz

The original (unsorted) map:
Letter: b - Count: 3 - Words: [buzzing  bees  buzz  ]
Letter: u - Count: 2 - Words: [buzzing  buzz  ]
Letter: z - Count: 4 - Words: [buzzing  buzzing  buzz  buzz  ]
Letter: i - Count: 1 - Words: [buzzing  ]
Letter: n - Count: 1 - Words: [buzzing  ]
Letter: g - Count: 1 - Words: [buzzing  ]
Letter: e - Count: 2 - Words: [bees  bees  ]
Letter: s - Count: 1 - Words: [bees  ]

The sorted map:
Letter: i - Count: 1 - Words: [buzzing  ]
Letter: n - Count: 1 - Words: [buzzing  ]
Letter: g - Count: 1 - Words: [buzzing  ]
Letter: s - Count: 1 - Words: [bees  ]
Letter: u - Count: 2 - Words: [buzzing  buzz  ]
Letter: e - Count: 2 - Words: [bees  bees  ]
Letter: b - Count: 3 - Words: [buzzing  bees  buzz  ]
Letter: z - Count: 4 - Words: [buzzing  buzzing  buzz  buzz  ]
```

```
Selection Sort

Original String:    Buzzing bees buzz.
Preprocessed String: buzzing bees buzz

The original (unsorted) map:
Letter: b - Count: 3 - Words: [buzzing  bees  buzz  ]
Letter: u - Count: 2 - Words: [buzzing  buzz  ]
Letter: z - Count: 4 - Words: [buzzing  buzzing  buzz  buzz  ]
Letter: i - Count: 1 - Words: [buzzing  ]
Letter: n - Count: 1 - Words: [buzzing  ]
Letter: g - Count: 1 - Words: [buzzing  ]
Letter: e - Count: 2 - Words: [bees  bees  ]
Letter: s - Count: 1 - Words: [bees  ]

The sorted map:
Letter: i - Count: 1 - Words: [buzzing  ]
Letter: n - Count: 1 - Words: [buzzing  ]
Letter: g - Count: 1 - Words: [buzzing  ]
Letter: s - Count: 1 - Words: [bees  ]
Letter: u - Count: 2 - Words: [buzzing  buzz  ]
Letter: e - Count: 2 - Words: [bees  bees  ]
Letter: b - Count: 3 - Words: [buzzing  bees  buzz  ]
Letter: z - Count: 4 - Words: [buzzing  buzzing  buzz  buzz  ]
```

```
Insertion Sort

Original String:    Buzzing bees buzz.
Preprocessed String: buzzing bees buzz

The original (unsorted) map:
Letter: b - Count: 3 - Words: [buzzing  bees  buzz  ]
Letter: u - Count: 2 - Words: [buzzing  buzz  ]
Letter: z - Count: 4 - Words: [buzzing  buzzing  buzz  buzz  ]
Letter: i - Count: 1 - Words: [buzzing  ]
Letter: n - Count: 1 - Words: [buzzing  ]
Letter: g - Count: 1 - Words: [buzzing  ]
Letter: e - Count: 2 - Words: [bees  bees  ]
Letter: s - Count: 1 - Words: [bees  ]

The sorted map:
Letter: i - Count: 1 - Words: [buzzing  ]
Letter: n - Count: 1 - Words: [buzzing  ]
Letter: g - Count: 1 - Words: [buzzing  ]
Letter: s - Count: 1 - Words: [bees  ]
Letter: u - Count: 2 - Words: [buzzing  buzz  ]
Letter: e - Count: 2 - Words: [bees  bees  ]
Letter: b - Count: 3 - Words: [buzzing  bees  buzz  ]
Letter: z - Count: 4 - Words: [buzzing  buzzing  buzz  buzz  ]
```

```
Bubble Sort

Original String:    Buzzing bees buzz.
Preprocessed String: buzzing bees buzz

The original (unsorted) map:
Letter: b - Count: 3 - Words: [buzzing  bees  buzz  ]
Letter: u - Count: 2 - Words: [buzzing  buzz  ]
Letter: z - Count: 4 - Words: [buzzing  buzzing  buzz  buzz  ]
Letter: i - Count: 1 - Words: [buzzing  ]
Letter: n - Count: 1 - Words: [buzzing  ]
Letter: g - Count: 1 - Words: [buzzing  ]
Letter: e - Count: 2 - Words: [bees  bees  ]
Letter: s - Count: 1 - Words: [bees  ]

The sorted map:
Letter: i - Count: 1 - Words: [buzzing  ]
Letter: n - Count: 1 - Words: [buzzing  ]
Letter: g - Count: 1 - Words: [buzzing  ]
Letter: s - Count: 1 - Words: [bees  ]
Letter: u - Count: 2 - Words: [buzzing  buzz  ]
Letter: e - Count: 2 - Words: [bees  bees  ]
Letter: b - Count: 3 - Words: [buzzing  bees  buzz  ]
Letter: z - Count: 4 - Words: [buzzing  buzzing  buzz  buzz  ]
```

```
Quick Sort

Original String:    Buzzing bees buzz.
Preprocessed String: buzzing bees buzz

The original (unsorted) map:
Letter: b - Count: 3 - Words: [buzzing  bees  buzz  ]
Letter: u - Count: 2 - Words: [buzzing  buzz  ]
Letter: z - Count: 4 - Words: [buzzing  buzzing  buzz  buzz  ]
Letter: i - Count: 1 - Words: [buzzing  ]
Letter: n - Count: 1 - Words: [buzzing  ]
Letter: g - Count: 1 - Words: [buzzing  ]
Letter: e - Count: 2 - Words: [bees  bees  ]
Letter: s - Count: 1 - Words: [bees  ]

The sorted map:
Letter: i - Count: 1 - Words: [buzzing  ]
Letter: n - Count: 1 - Words: [buzzing  ]
Letter: g - Count: 1 - Words: [buzzing  ]
Letter: s - Count: 1 - Words: [bees  ]
Letter: u - Count: 2 - Words: [buzzing  buzz  ]
Letter: e - Count: 2 - Words: [bees  bees  ]
Letter: b - Count: 3 - Words: [buzzing  bees  buzz  ]
Letter: z - Count: 4 - Words: [buzzing  buzzing  buzz  buzz  ]
```

Test2)

```
yMap
Enter a string: 'Hush, hush!' whispered the rushing wind.
Merge Sort
Original String:       'Hush, hush!' whispered the rushing wind.
Preprocessed String: hush hush whispered the rushing wind

The original (unsorted) map:
Letter: h - Count: 7 - Words: [hush  hush  hush  hush  whispered  the  rushing  ]
Letter: u - Count: 3 - Words: [hush  hush  rushing  ]
Letter: s - Count: 4 - Words: [hush  hush  whispered  rushing  ]
Letter: w - Count: 2 - Words: [whispered  wind  ]
Letter: i - Count: 3 - Words: [whispered  rushing  wind  ]
Letter: p - Count: 1 - Words: [whispered  ]
Letter: e - Count: 3 - Words: [whispered  whispered  the  ]
Letter: r - Count: 2 - Words: [whispered  rushing  ]
Letter: d - Count: 2 - Words: [whispered  wind  ]
Letter: t - Count: 1 - Words: [the  ]
Letter: n - Count: 2 - Words: [rushing  wind  ]
Letter: g - Count: 1 - Words: [rushing  ]

The sorted map:
Letter: p - Count: 1 - Words: [whispered  ]
Letter: t - Count: 1 - Words: [the  ]
Letter: g - Count: 1 - Words: [rushing  ]
Letter: w - Count: 2 - Words: [whispered  wind  ]
Letter: r - Count: 2 - Words: [whispered  rushing  ]
Letter: d - Count: 2 - Words: [whispered  wind  ]
Letter: n - Count: 2 - Words: [rushing  wind  ]
Letter: u - Count: 3 - Words: [hush  hush  rushing  ]
Letter: i - Count: 3 - Words: [whispered  rushing  wind  ]
Letter: e - Count: 3 - Words: [whispered  whispered  the  ]
Letter: s - Count: 4 - Words: [hush  hush  whispered  rushing  ]
Letter: h - Count: 7 - Words: [hush  hush  hush  hush  whispered  the  rushing  ]
```

```
Selection Sort

Original String:       'Hush, hush!' whispered the rushing wind.
Preprocessed String: hush hush whispered the rushing wind

The original (unsorted) map:
Letter: h - Count: 7 - Words: [hush  hush  hush  hush  whispered  the  rushing  ]
Letter: u - Count: 3 - Words: [hush  hush  rushing  ]
Letter: s - Count: 4 - Words: [hush  hush  whispered  rushing  ]
Letter: w - Count: 2 - Words: [whispered  wind  ]
Letter: i - Count: 3 - Words: [whispered  rushing  wind  ]
Letter: p - Count: 1 - Words: [whispered  ]
Letter: e - Count: 3 - Words: [whispered  whispered  the  ]
Letter: r - Count: 2 - Words: [whispered  rushing  ]
Letter: d - Count: 2 - Words: [whispered  wind  ]
Letter: t - Count: 1 - Words: [the  ]
Letter: n - Count: 2 - Words: [rushing  wind  ]
Letter: g - Count: 1 - Words: [rushing  ]

The sorted map:
Letter: p - Count: 1 - Words: [whispered  ]
Letter: t - Count: 1 - Words: [the  ]
Letter: g - Count: 1 - Words: [rushing  ]
Letter: w - Count: 2 - Words: [whispered  wind  ]
Letter: r - Count: 2 - Words: [whispered  rushing  ]
Letter: d - Count: 2 - Words: [whispered  wind  ]
Letter: n - Count: 2 - Words: [rushing  wind  ]
Letter: i - Count: 3 - Words: [whispered  rushing  wind  ]
Letter: u - Count: 3 - Words: [hush  hush  rushing  ]
Letter: e - Count: 3 - Words: [whispered  whispered  the  ]
Letter: s - Count: 4 - Words: [hush  hush  whispered  rushing  ]
Letter: h - Count: 7 - Words: [hush  hush  hush  hush  whispered  the  rushing  ]
```

```
Insertion Sort

Original String:     'Hush, hush!' whispered the rushing wind.
Preprocessed String: hush hush whispered the rushing wind

The original (unsorted) map:
Letter: h - Count: 7 - Words: [hush  hush  hush  hush  whispered  the  rushing  ]
Letter: u - Count: 3 - Words: [hush  hush  rushing  ]
Letter: s - Count: 4 - Words: [hush  hush  whispered  rushing  ]
Letter: w - Count: 2 - Words: [whispered  wind  ]
Letter: i - Count: 3 - Words: [whispered  rushing  wind  ]
Letter: p - Count: 1 - Words: [whispered  ]
Letter: e - Count: 3 - Words: [whispered  whispered  the  ]
Letter: r - Count: 2 - Words: [whispered  rushing  ]
Letter: d - Count: 2 - Words: [whispered  wind  ]
Letter: t - Count: 1 - Words: [the  ]
Letter: n - Count: 2 - Words: [rushing  wind  ]
Letter: g - Count: 1 - Words: [rushing  ]

The sorted map:
Letter: p - Count: 1 - Words: [whispered  ]
Letter: t - Count: 1 - Words: [the  ]
Letter: g - Count: 1 - Words: [rushing  ]
Letter: w - Count: 2 - Words: [whispered  wind  ]
Letter: r - Count: 2 - Words: [whispered  rushing  ]
Letter: d - Count: 2 - Words: [whispered  wind  ]
Letter: n - Count: 2 - Words: [rushing  wind  ]
Letter: u - Count: 3 - Words: [hush  hush  rushing  ]
Letter: i - Count: 3 - Words: [whispered  rushing  wind  ]
Letter: e - Count: 3 - Words: [whispered  whispered  the  ]
Letter: s - Count: 4 - Words: [hush  hush  whispered  rushing  ]
Letter: h - Count: 7 - Words: [hush  hush  hush  hush  whispered  the  rushing  ]
```

```
Bubble Sort

Original String:     'Hush, hush!' whispered the rushing wind.
Preprocessed String: hush hush whispered the rushing wind

The original (unsorted) map:
Letter: h - Count: 7 - Words: [hush  hush  hush  hush  whispered  the  rushing  ]
Letter: u - Count: 3 - Words: [hush  hush  rushing  ]
Letter: s - Count: 4 - Words: [hush  hush  whispered  rushing  ]
Letter: w - Count: 2 - Words: [whispered  wind  ]
Letter: i - Count: 3 - Words: [whispered  rushing  wind  ]
Letter: p - Count: 1 - Words: [whispered  ]
Letter: e - Count: 3 - Words: [whispered  whispered  the  ]
Letter: r - Count: 2 - Words: [whispered  rushing  ]
Letter: d - Count: 2 - Words: [whispered  wind  ]
Letter: t - Count: 1 - Words: [the  ]
Letter: n - Count: 2 - Words: [rushing  wind  ]
Letter: g - Count: 1 - Words: [rushing  ]

The sorted map:
Letter: p - Count: 1 - Words: [whispered  ]
Letter: t - Count: 1 - Words: [the  ]
Letter: g - Count: 1 - Words: [rushing  ]
Letter: w - Count: 2 - Words: [whispered  wind  ]
Letter: r - Count: 2 - Words: [whispered  rushing  ]
Letter: d - Count: 2 - Words: [whispered  wind  ]
Letter: n - Count: 2 - Words: [rushing  wind  ]
Letter: u - Count: 3 - Words: [hush  hush  rushing  ]
Letter: i - Count: 3 - Words: [whispered  rushing  wind  ]
Letter: e - Count: 3 - Words: [whispered  whispered  the  ]
Letter: s - Count: 4 - Words: [hush  hush  whispered  rushing  ]
Letter: h - Count: 7 - Words: [hush  hush  hush  hush  whispered  the  rushing  ]
```

```
Quick Sort

Original String:      'Hush, hush!' whispered the rushing wind.
Preprocessed String: hush hush whispered the rushing wind

The original (unsorted) map:
Letter: h - Count: 7 - Words: [hush  hush  hush  hush  whispered  the  rushing  ]
Letter: u - Count: 3 - Words: [hush  hush  rushing  ]
Letter: s - Count: 4 - Words: [hush  hush  whispered  rushing  ]
Letter: w - Count: 2 - Words: [whispered  wind  ]
Letter: i - Count: 3 - Words: [whispered  rushing  wind  ]
Letter: p - Count: 1 - Words: [whispered  ]
Letter: e - Count: 3 - Words: [whispered  whispered  the  ]
Letter: r - Count: 2 - Words: [whispered  rushing  ]
Letter: d - Count: 2 - Words: [whispered  wind  ]
Letter: t - Count: 1 - Words: [the  ]
Letter: n - Count: 2 - Words: [rushing  wind  ]
Letter: g - Count: 1 - Words: [rushing  ]

The sorted map:
Letter: p - Count: 1 - Words: [whispered  ]
Letter: t - Count: 1 - Words: [the  ]
Letter: g - Count: 1 - Words: [rushing  ]
Letter: w - Count: 2 - Words: [whispered  wind  ]
Letter: r - Count: 2 - Words: [whispered  rushing  ]
Letter: d - Count: 2 - Words: [whispered  wind  ]
Letter: n - Count: 2 - Words: [rushing  wind  ]
Letter: e - Count: 3 - Words: [whispered  whispered  the  ]
Letter: u - Count: 3 - Words: [hush  hush  rushing  ]
Letter: i - Count: 3 - Words: [whispered  rushing  wind  ]
Letter: s - Count: 4 - Words: [hush  hush  whispered  rushing  ]
Letter: h - Count: 7 - Words: [hush  hush  hush  hush  whispered  the  rushing  ]
```

Test3)

```
Enter a string: See you Later Alligator! <3
Merge Sort
Original String:      See you Later Alligator! <3
Preprocessed String: see you later alligator

The original (unsorted) map:
Letter: s - Count: 1 - Words: [see  ]
Letter: e - Count: 3 - Words: [see  see  later  ]
Letter: y - Count: 1 - Words: [you  ]
Letter: o - Count: 2 - Words: [you  alligator  ]
Letter: u - Count: 1 - Words: [you  ]
Letter: l - Count: 3 - Words: [later  alligator  alligator  ]
Letter: a - Count: 3 - Words: [later  alligator  alligator  ]
Letter: t - Count: 2 - Words: [later  alligator  ]
Letter: r - Count: 2 - Words: [later  alligator  ]
Letter: i - Count: 1 - Words: [alligator  ]
Letter: g - Count: 1 - Words: [alligator  ]

The sorted map:
Letter: s - Count: 1 - Words: [see  ]
Letter: y - Count: 1 - Words: [you  ]
Letter: u - Count: 1 - Words: [you  ]
Letter: i - Count: 1 - Words: [alligator  ]
Letter: g - Count: 1 - Words: [alligator  ]
Letter: o - Count: 2 - Words: [you  alligator  ]
Letter: t - Count: 2 - Words: [later  alligator  ]
Letter: r - Count: 2 - Words: [later  alligator  ]
Letter: e - Count: 3 - Words: [see  see  later  ]
Letter: l - Count: 3 - Words: [later  alligator  alligator  ]
Letter: a - Count: 3 - Words: [later  alligator  alligator  ]
```

```
Selection Sort

Original String:    See you Later Alligator! <3
Preprocessed String: see you later alligator

The original (unsorted) map:
Letter: s - Count: 1 - Words: [see  ]
Letter: e - Count: 3 - Words: [see  see  later  ]
Letter: y - Count: 1 - Words: [you  ]
Letter: o - Count: 2 - Words: [you  alligator  ]
Letter: u - Count: 1 - Words: [you  ]
Letter: l - Count: 3 - Words: [later  alligator  alligator  ]
Letter: a - Count: 3 - Words: [later  alligator  alligator  ]
Letter: t - Count: 2 - Words: [later  alligator  ]
Letter: r - Count: 2 - Words: [later  alligator  ]
Letter: i - Count: 1 - Words: [alligator  ]
Letter: g - Count: 1 - Words: [alligator  ]

The sorted map:
Letter: s - Count: 1 - Words: [see  ]
Letter: y - Count: 1 - Words: [you  ]
Letter: u - Count: 1 - Words: [you  ]
Letter: i - Count: 1 - Words: [alligator  ]
Letter: g - Count: 1 - Words: [alligator  ]
Letter: t - Count: 2 - Words: [later  alligator  ]
Letter: r - Count: 2 - Words: [later  alligator  ]
Letter: o - Count: 2 - Words: [you  alligator  ]
Letter: a - Count: 3 - Words: [later  alligator  alligator  ]
Letter: l - Count: 3 - Words: [later  alligator  alligator  ]
Letter: e - Count: 3 - Words: [see  see  later  ]
```

```
Insertion Sort

Original String:    See you Later Alligator! <3
Preprocessed String: see you later alligator

The original (unsorted) map:
Letter: s - Count: 1 - Words: [see  ]
Letter: e - Count: 3 - Words: [see  see  later  ]
Letter: y - Count: 1 - Words: [you  ]
Letter: o - Count: 2 - Words: [you  alligator  ]
Letter: u - Count: 1 - Words: [you  ]
Letter: l - Count: 3 - Words: [later  alligator  alligator  ]
Letter: a - Count: 3 - Words: [later  alligator  alligator  ]
Letter: t - Count: 2 - Words: [later  alligator  ]
Letter: r - Count: 2 - Words: [later  alligator  ]
Letter: i - Count: 1 - Words: [alligator  ]
Letter: g - Count: 1 - Words: [alligator  ]

The sorted map:
Letter: s - Count: 1 - Words: [see  ]
Letter: y - Count: 1 - Words: [you  ]
Letter: u - Count: 1 - Words: [you  ]
Letter: i - Count: 1 - Words: [alligator  ]
Letter: g - Count: 1 - Words: [alligator  ]
Letter: o - Count: 2 - Words: [you  alligator  ]
Letter: t - Count: 2 - Words: [later  alligator  ]
Letter: r - Count: 2 - Words: [later  alligator  ]
Letter: e - Count: 3 - Words: [see  see  later  ]
Letter: l - Count: 3 - Words: [later  alligator  alligator  ]
Letter: a - Count: 3 - Words: [later  alligator  alligator  ]
```

```
Bubble Sort

Original String:    See you Later Alligator! <3
Preprocessed String: see you later alligator

The original (unsorted) map:
Letter: s - Count: 1 - Words: [see  ]
Letter: e - Count: 3 - Words: [see  see  later  ]
Letter: y - Count: 1 - Words: [you  ]
Letter: o - Count: 2 - Words: [you  alligator  ]
Letter: u - Count: 1 - Words: [you  ]
Letter: l - Count: 3 - Words: [later  alligator  alligator  ]
Letter: a - Count: 3 - Words: [later  alligator  alligator  ]
Letter: t - Count: 2 - Words: [later  alligator  ]
Letter: r - Count: 2 - Words: [later  alligator  ]
Letter: i - Count: 1 - Words: [alligator  ]
Letter: g - Count: 1 - Words: [alligator  ]

The sorted map:
Letter: s - Count: 1 - Words: [see  ]
Letter: y - Count: 1 - Words: [you  ]
Letter: u - Count: 1 - Words: [you  ]
Letter: i - Count: 1 - Words: [alligator  ]
Letter: g - Count: 1 - Words: [alligator  ]
Letter: o - Count: 2 - Words: [you  alligator  ]
Letter: t - Count: 2 - Words: [later  alligator  ]
Letter: r - Count: 2 - Words: [later  alligator  ]
Letter: e - Count: 3 - Words: [see  see  later  ]
Letter: l - Count: 3 - Words: [later  alligator  alligator  ]
Letter: a - Count: 3 - Words: [later  alligator  alligator  ]
```

```
Quick Sort

Original String:    See you Later Alligator! <3
Preprocessed String: see you later alligator

The original (unsorted) map:
Letter: s - Count: 1 - Words: [see  ]
Letter: e - Count: 3 - Words: [see  see  later  ]
Letter: y - Count: 1 - Words: [you  ]
Letter: o - Count: 2 - Words: [you  alligator  ]
Letter: u - Count: 1 - Words: [you  ]
Letter: l - Count: 3 - Words: [later  alligator  alligator  ]
Letter: a - Count: 3 - Words: [later  alligator  alligator  ]
Letter: t - Count: 2 - Words: [later  alligator  ]
Letter: r - Count: 2 - Words: [later  alligator  ]
Letter: i - Count: 1 - Words: [alligator  ]
Letter: g - Count: 1 - Words: [alligator  ]

The sorted map:
Letter: s - Count: 1 - Words: [see  ]
Letter: y - Count: 1 - Words: [you  ]
Letter: u - Count: 1 - Words: [you  ]
Letter: i - Count: 1 - Words: [alligator  ]
Letter: g - Count: 1 - Words: [alligator  ]
Letter: t - Count: 2 - Words: [later  alligator  ]
Letter: r - Count: 2 - Words: [later  alligator  ]
Letter: o - Count: 2 - Words: [you  alligator  ]
Letter: a - Count: 3 - Words: [later  alligator  alligator  ]
Letter: l - Count: 3 - Words: [later  alligator  alligator  ]
Letter: e - Count: 3 - Words: [see  see  later  ]
```