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## Part 6 Writeup

### Output of each search:

```
STATS:
list size N = 2
level 1 array 1 of 4 used.
level 2 array sizes: min = 2 used, avg = 2.0 used, max = 2
used.

searching for: search

Beatles, The, "Searchin'"
Lynyrd Skynyrd, "Searching"

Total number of results: 2
```

```
STATS:
list size N = 23
level 1 array 7 of 8 used.
level 2 array sizes: min = 2 used, avg = 3.3 used, max = 5
used.

searching for: Angel

Aerosmith, "Angel"
Aretha Franklin, "Angel"
Elvis Presley, "Angel"
Fleetwood Mac, "Angel"
Jimi Hendrix, "Angel"
Pearl Jam, "Angel"
John Lennon, "Angel Baby"
Bonnie Raitt, "Angel From Montgomery"
Bonnie Raitt, "Angel From Montgomery [Live/Road Tested]"
Bonnie Raitt, "Angel From Montgomery [Live] [7'' Version]"

Total number of results: 23
```

STATS:

list size N = 1148

level 1 array 56 of 64 used.

level 2 array sizes: min = 2 used, avg = 20.5 used, max = 38 used.

searching for: T

Lynyrd Skynyrd, "T for Texas"

Elton John, "T' De Mon"

Blondie, "T-Birds"

Elvis Presley, "T-R-O-U-B-L-E"

Alabama, "T.L.C. A.S.A.P."

Santana, "Taboo"

Rush, "Tai Shan"

Rush, "Take A Friend"

Alabama, "Take A Little Trip"

Beach Boys, The, "Take A Load Off Your Feet"

Total number of results: 1148

## Stats for the entire RaggedArrayList of songs:

```
STATS:  
list size N = 10514  
level 1 array 120 of 128 used.  
level 2 array sizes: min = 64 used, avg = 87.6 used, max = 127  
used.
```

The expected values for both the length of the level 1 array and the average length of the level 2 arrays is  $\sqrt{10514}$ , or approximately 102. However, what actually happened is that the level 2 arrays were smaller than the level 1 array.

This is caused by the method of inserting items into the RAL. When a level 2 array is split, the new arrays are usually much smaller than the level 1 array. For example, inserting “h” into a RAL that looks like this:

0: a b c d

1: d e f g

2: i j k l

3: m n o p

would result in this:

0: a b c d

1: d e

2: f g h

3: i j k l

4: m n o p

The level 2 array splitting resulted in two new level 2 arrays that are much smaller than the l1 array.

## GUI Screenshot:

The screenshot shows a window titled "Song Search" with standard Windows window controls (minimize, maximize, close). The window has a blue header bar with the text "Song Search" in a large, bold, black font. Below the header, there is a "Browse" button. Underneath, there are two search input sections. The first section is for "Artist" with a text box and a "Search" button. The second section is for "Title" with a text box containing the word "You" and a "Search" button. Below these, there are two more search input sections for "Lyrics Words" and "Lyrics Phrase", each with a text box and a "Search" button. A status bar at the bottom of the search area displays "197 results found. Your search took 0.005 seconds". Below this, a list of search results is shown, including "Bonnie Raitt, 'You'", "Steppenwolf, 'You'", "Who, The, 'You'", "Scorpions, 'You & I'", "Bob Dylan, 'You Ain't Goin' Nowhere'", "Kenny Rogers, 'You and I'", "Fleetwood Mac, 'You and I, Pt. 2'", "Kenny Rogers, 'You and Me feat. Dottie West'", "Bob Dylan, 'You Angel You'", and "Pearl Jam, 'You Are'". To the right of the list is a vertical scrollbar. At the bottom of the window, there is a section labeled "Lyrics" with a large, empty text box.

**Song Search**

**Browse**

**Artist**  **Search**

**Title**  **Search**

**Lyrics Words**  **Search**

**Lyrics Phrase**  **Search**

**197 results found. Your search took 0.005 seconds**

- Bonnie Raitt, "You"
- Steppenwolf, "You"
- Who, The, "You"
- Scorpions, "You & I"
- Bob Dylan, "You Ain't Goin' Nowhere"
- Kenny Rogers, "You and I"
- Fleetwood Mac, "You and I, Pt. 2"
- Kenny Rogers, "You and Me feat. Dottie West"
- Bob Dylan, "You Angel You"
- Pearl Jam, "You Are"

**Lyrics**