For: Melissa Bakke

Assignment: Exercise 23-12 Radix Sort

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| **Screenshot(s)** |
| **List containing only 100 numbers for display purposes** |
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| **Code** |
| *import java.util.ArrayList;*  */\*\**  *\* Class: RadixSort*  *\* Developer: Melissa Bakke*  *\* Date: 03/28/2017*  *\* Purpose: Program that randomly generates 1000000 integers and sorts them*  *\* using a radix sort.*  *\*/*  *public class RadixSort {*    */\*\**  *\* @param args the command line arguments*  *\*/*  *public static void main(String[] args) {*  *// Create new list*  *int[] newList = new int[1000000];*    *// Loop through list to add random numbers*  *for (int i = 0; i < newList.length; i++) {*  *newList[i] = (int)(Math.random() \* 1000000);*  *}*    *// Print unsorted list, 15 numbers to a row*  *for (int i = 0; i < newList.length; i++) {*  *if (i % 15 == 0) {*  *System.out.print("\n" + newList[i] + " ");*  *}*  *else {*  *System.out.print(newList[i] + " ");*  *}*  *}*    *System.out.println("\n");*    *// Call radixSort method, passing it the list and number of digits*  *radixSort(newList, 7);*    *// Print sorted list, 15 numbers to a row*  *for (int i = 0; i < newList.length; i++) {*  *if (i % 15 == 0) {*  *System.out.print("\n" + newList[i] + " ");*  *}*  *else {*  *System.out.print(newList[i] + " ");*  *}*  *}*    *}*    *public static void radixSort(int[] list, int digits) {*  *// Create arraylist for buckets*  *ArrayList<Integer>[] buckets = new ArrayList[10];*    *// Create an arraylist for each bucket*  *for (int i = 0; i < buckets.length; i++) {*  *buckets[i] = new ArrayList<Integer>();*  *}*    *for (int n = 0; n <= digits ; n++) {*  *// Clear buckets*  *for (int i = 0; i < buckets.length; i++) {*  *buckets[i].clear();*  *}*    *// Loop through list, adding numbers to appropriate bucket*  *for (int i = 0; i < list.length; i++) {*  *int key = getKey(list[i], n);*  *buckets[key].add(list[i]);*  *}*    *// Loop through buckets, adding numbers back to list in appropriate order*  *// index is a counter*  *int index = 0;*  *for (int i = 0; i < buckets.length; i++) {*  *for (int j = 0; j < buckets[i].size(); j++) {*  *list[index++] = buckets[i].get(j);*  *}*  *}*  *}*  *} // End radixSort method*    *public static int getKey(int number, int position) {*  *int result = 1;*  *for (int i = 0; i < position; i++) {*  *result \*= 10;*  *}*    *return (number / result) % 10;*  *}*  *}* |
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