

Java – Intro to Sorting

19.01 Bubble.java

Write a program that reads a list of words from a file, sorts them in alphabetical order, and outputs the results. Implement bubble sort – do not call `Arrays.sort()`. Make the sorting method generic with the following method signature:

```
public static <T extends Comparable<? super T>> void bubbleSort(List<T> list)
```

Sample Execution

Please enter list to sort: **presidents.txt**

Adams, John
Adams, John Quincy
Arthur, Chester
Biden, Joe
Buchanan, James
Buren, Martin Van
Bush, George
Bush, George W.
Carter, Jimmy
Cleveland, Grover
Cleveland, Grover
Clinton, Bill
Coolidge, Calvin
Eisenhower, Dwight
Fillmore, Millard
Ford, Gerald
Garfield, James
Grant, Ulysses S.
Harding, Warren G.
Harrison, Benjamin
Harrison, William Henry
Hayes, Rutherford B.
Hoover, Herbert
Jackson, Andrew
Jefferson, Thomas
Johnson, Andrew
Johnson, Lyndon B.

Sample Execution

```
Kennedy, John F.  
Lincoln, Abraham  
Madison, James  
McKinley, William  
Monroe, James  
Nixon, Richard  
Obama, Barack  
Pierce, Franklin  
Polk, James K.  
Reagan, Ronald  
Roosevelt, Franklin D.  
Roosevelt, Theodore  
Taft, William Howard  
Taylor, Zachary  
Truman, Harry S.  
Trump, Donald  
Tyler, John  
Washington, George  
Wilson, Woodrow
```

19.02 Selection.java

Given an array of numbers, sort them in increasing order by implementing selection sort.

Sample Data

```
int[] ary = {-3, 5, 33, 77, 12, -22};  
selectionSort(ary);  
System.out.println(Arrays.toString(ary));  
  
ary = new int[]{9, 8, 7, 6, 5, 4, 3, 2, 1};  
selectionSort(ary);  
System.out.println(Arrays.toString(ary));  
  
ary = new int[]{-13, -7, 3, 4, 4, 11, 13};  
selectionSort(ary);  
System.out.println(Arrays.toString(ary));  
  
// add more test cases
```

Sample Execution

```
[-22, -3, 5, 12, 33, 77]  
[1, 2, 3, 4, 5, 6, 7, 8, 9]  
[-13, -7, 3, 4, 4, 11, 13]
```

19.03 Hard8.java

Write a method that takes an array of integers and moves all of the 8's to the front. Implement using a slight twist of insertion sort. The non 8's will remain in the same order.

```
int[] ary = {8, 5, 8, 77, 12, 8};  
shift8s(ary);  
System.out.println(Arrays.toString(ary));  
  
ary = new int[]{9, 8, 8, 6, 3, 8, 4, 2, 1};  
shift8s(ary);  
System.out.println(Arrays.toString(ary));  
  
ary = new int[]{-13, -7, 8, 8, 4, 8, 8};  
shift8s(ary);  
System.out.println(Arrays.toString(ary));  
  
// add more test cases
```

Sample Execution

```
[8, 8, 8, 5, 77, 12]  
[8, 8, 8, 9, 6, 3, 4, 2, 1]  
[8, 8, 8, 8, -13, -7, 4]
```

19.04 GoofySort.java

Write a program that reads a line of words and sorts them in a goofy manner as shown below.

Sample Execution

Enter a sentence :: Bubble Sort has lots of swaps

sfsste

potarl

a ohob

w l Sb

s u

B

Enter a sentence :: Selection Sort is always quadratic

csstn

iyiro

ta oi

aw St

rl c

da e

a l

u e

q S

Enter a sentence :: Best case for insertion sort is linear

rstnret

airooss

e oifae

n st cB

i r

l e

s

n

i