

Project 2: Bubble Sort(Java)

Due : 02/25/2024

***** IV. main (...) *****

step 0: inFile open input file via args [0]

// use BufferedReader inFile = new BufferedReader (new FileReader (args[0]) outFile open
output file via args [1]

// use BufferedWriter outFile = new BufferedWriter (new FileWriter (args[1]) debugFile open
debugFile via args [2]

// use BufferedWriter debugFile = new BufferedWriter (new FileWriter (args[2])

step 1: countData (inFile, debugFile)

debugFile "In main () count =" write count. // use whatever you like in Java to write output

step 2: dataAry dynamically allocate, size of count. // i.e., dataAry[] = new String [count] step 3:
close inFile

step 4: inFile open input file via args [0] // re-open inFile as in the above.

step 5: loadData (inFile, dataAry, count, debugFile)

step 6: outFile "*** printing dataAry before sorting. ***" printDataAry (dataAry, count, outFile,
debugFile)

step 7: bubbleSort (dataAry, count, debugFile)

step 8: outFile "*** Printing dataAry after sorting. ***" printDataAry (dataAry, count, outFile,
debugFile)

step 9: close all files

***** V. (int) countData (inFile, debugFile)

***** step 0: debugFile "Entering countData ()" step 1: count0

step 2: data read one word/string at a time from inFile. // use whatever in Java to get a
word/string from inFile. step 3: count++

step 4: repeat step 2 to step 3 while inFile is NOT empty.

step 5: debugFile "leaving countData count =" write count

step 6: return count

Source Code

```
import java.io.BufferedReader;
import java.io.BufferedWriter;
import java.io.FileReader;
import java.io.FileWriter;
import java.io.IOException;

public class ThakuriD_Project2_Main {
    public static class Sort {
        int count;
        String[] dataAry;

        public int countData(BufferedReader inFile, BufferedWriter deBugFile) throws Exception {
            deBugFile.write("Entering countData()\n");
            count = 0;
            String data;
            while ((data= inFile.readLine()) != null) {
                String[] words = data.trim().split("\\s+");
                count += words.length;
            }
            deBugFile.write("leaving countData count = " + count + "\n");
            return count;
        }

        public void loadData(BufferedReader inFile, String[] dataAry, int count, BufferedWriter
deBugFile) throws IOException {
            deBugFile.write("Entering loadData ()\n");
            int index = 0;
            String data;
            while ((data = inFile.readLine()) != null && index<count) {
                String[] words = data.trim().split("\\s+");
                for (String word : words) {
                    if (index < count) {
                        dataAry[index] = word;
                        index++;
                    }
                }
            }
            deBugFile.write("leaving loadData()\n");
        }

        public void bubbleSort(String[] dataAry, int count, BufferedWriter deBugFile) throws
Exception {
```

```

debugFile.write("Entering bubbleSort ()\n");
String tmp;
int last = count - 1;
boolean swapFlag;

do {
    int i=0;
    swapFlag = false;
    while (i < last) {
        if (dataArray[i].compareTo(dataArray[i + 1]) > 0) {
            tmp = dataArray[i];
            dataArray[i] = dataArray[i + 1];
            dataArray[i + 1] = tmp;
            swapFlag = true;
        }
        i++;
    }

    debugFile.write("*** In bubbleSort after one iteration. i = " + i + "; last = " + last + ";
swapFlag = " + swapFlag + "\n");
    debugFile.write("*** Printing dataArray***");
    printDataAry(dataArray, count, debugFile, debugFile);
    last--;
} while (swapFlag && last > 0);
debugFile.write("leaving bubbleSort ()\n");
}

```

```

public void printDataAry(String[] dataArray, int count, BufferedWriter fileOut, BufferedWriter
debugFile) throws Exception {
    debugFile.write("Entering printDataAry()\n");
    int index = 0;

    while (index < count) {
        fileOut.write(dataArray[index] + "\n");
        index++;
    }

    debugFile.write("leaving printDataAry()\n");
    debugFile.write("\n");
}

```

```

    }

    public static void main(String[] args) throws Exception {

        ThakuriD_Project2_Main.Sort sorter = new ThakuriD_Project2_Main.Sort();
        BufferedReader inFile = new BufferedReader(new FileReader(args[0]));
        BufferedWriter outFile = new BufferedWriter(new FileWriter(args[1]));
        BufferedWriter deBugFile = new BufferedWriter(new FileWriter(args[2]));

        int count = sorter.countData(inFile, deBugFile);
        deBugFile.write("In main() count = " + count + "\n");

        String[] dataAry = new String[count];
        inFile.close();

        inFile = new BufferedReader(new FileReader(args[0]));
        sorter.loadData(inFile, dataAry, count, deBugFile);
        outFile.write("***Printing dataAry before sorting**\n");

        sorter.printDataAry(dataAry, count, outFile, deBugFile);
        sorter.bubbleSort(dataAry, count, deBugFile);
        outFile.write("\n");

        outFile.write("***Printing dataAry after sorting**\n");
        sorter.printDataAry(dataAry, count, outFile, deBugFile);

        inFile.close();
        outFile.close();
        deBugFile.close();
    }
}

```

outFile for bubbleSort_Data1

****Printing dataAry before sorting****

AbCdEfG

cCaAbb

CcaabB

BbAa

aA

AAbb

zxcccc

XyZzz

xyyk

ZZZZ

Hijk

jlJkL

Acc

aCC

Bdd

bggff

aAaA

AccaCC

****Printing dataAry after sorting****

AAbb

AbCdEfG

Acc

AccaCC

BbAa

Bdd

CcaabB

Hijk

XyZzz

ZZZZ

aA

aAaA

aCC

bggff

cCaAbb

jlJkL

xyyk

zxcccc

deBugFile for bubbleSort_Data1

Entering countData()
leaving countData count = 18
In main() count = 18
Entering loadData ()
leaving loadData()
Entering printDataAry()
leaving printDataAry()

Entering bubbleSort ()
** In bubbleSort after one iteration. i = 17; last = 17; swapFlag = true
** Printing dataAry**Entering printDataAry()
AbCdEfG
CcaabB
BbAa
aA
AAbb
cCaAbb
XyZzz
xyyK
ZZZZ
Hijk
jIJkL
Acc
aCC
Bdd
bggff
aAaA
AccaCC
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 16; last = 16; swapFlag = true
** Printing dataAry**Entering printDataAry()
AbCdEfG
BbAa
CcaabB
AAbb
aA
XyZzz
cCaAbb
ZZZZ
Hijk
jIJkL

Acc
aCC
Bdd
bggff
aAaA
AccaCC
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 15; last = 15; swapFlag = true

** Printing dataAry**Entering printDataAry()

AbCdEfG

BbAa

AAbb

CcaabB

XyZzz

aA

ZZZZ

Hijk

cCaAbb

Acc

aCC

Bdd

bggff

aAaA

AccaCC

jlJkL

xyyk

zxcccc

leaving printDataAry()

** In bubbleSort after one iteration. i = 14; last = 14; swapFlag = true

** Printing dataAry**Entering printDataAry()

AbCdEfG

AAbb

BbAa

CcaabB

XyZzz

ZZZZ

Hijk

aA

Acc

aCC

Bdd
bggff
aAaA
AccaCC
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 13; last = 13; swapFlag = true

** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
BbAa
CcaabB
XyZzz
Hijk
ZZZZ
Acc
aA
Bdd
aCC
aAaA
AccaCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 12; last = 12; swapFlag = true

** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
BbAa
CcaabB
Hijk
XyZzz
Acc
ZZZZ
Bdd
aA

aAaA
AccaCC
aCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 11; last = 11; swapFlag = true
** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
BbAa
CcaabB
Hijk
Acc
XyZzz
Bdd
ZZZZ
aA
AccaCC
aAaA
aCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 10; last = 10; swapFlag = true
** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
BbAa
CcaabB
Acc
Hijk
Bdd
XyZzz
ZZZZ
AccaCC

aA
aAaA
aCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 9; last = 9; swapFlag = true
** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
BbAa
Acc
CcaabB
Bdd
Hijk
XyZzz
AccaCC
ZZZZ
aA
aAaA
aCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 8; last = 8; swapFlag = true
** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
Acc
BbAa
Bdd
CcaabB
Hijk
AccaCC
XyZzz
ZZZZ

aA
aAaA
aCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 7; last = 7; swapFlag = true
** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
Acc
BbAa
Bdd
CcaabB
AccaCC
Hijk
XyZzz
ZZZZ
aA
aAaA
aCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 6; last = 6; swapFlag = true
** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
Acc
BbAa
Bdd
AccaCC
CcaabB
Hijk
XyZzz
ZZZZ

aA
aAaA
aCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 5; last = 5; swapFlag = true
** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
Acc
BbAa
AccaCC
Bdd
CcaabB
Hijk
XyZzz
ZZZZ
aA
aAaA
aCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 4; last = 4; swapFlag = true
** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
Acc
AccaCC
BbAa
Bdd
CcaabB
Hijk
XyZzz
ZZZZ

aA
aAaA
aCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

** In bubbleSort after one iteration. i = 3; last = 3; swapFlag = false
** Printing dataAry**Entering printDataAry()

AAbb
AbCdEfG
Acc
AccaCC
BbAa
Bdd
CcaabB
Hijk
XyZzz
ZZZZ
aA
aAaA
aCC
bggff
cCaAbb
jIJkL
xyyk
zxcccc
leaving printDataAry()

leaving bubbleSort ()
Entering printDataAry()
leaving printDataAry()

outFile for bubbleSort_Data2

****Printing dataAry before sorting****

Vincenzo
Alexis
Jason
Shahan
Angel
Edwin
Talha
Shadman
Gurnoor
Krzysztof
Eunhee
Rajin
Arellano
Piyush
Guo
Ilma
Kaur
Jurgen
Bashir
Jhonatan
Landerer
Mohammed
Patel
Shaharin
Ziyu
Zhang
Eliyahu
Rajesh
Mandal

****Printing dataAry after sorting****

Alexis

Angel
Arellano
Bashir
Edwin
Eliyahu
Eunhee
Guo
Gurnoor
Ilma
Jason
Jhonatan
Jurgen
Kaur
Krzysztof
Landerer
Mandal
Mohammed
Patel
Piyush
Rajesh
Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu

deBugFile for bubbleSort_Data2

Entering countData()
leaving countData count = 29
In main() count = 29
Entering loadData ()
leaving loadData()
Entering printDataAry()
leaving printDataAry()

Entering bubbleSort ()
** In bubbleSort after one iteration. i = 28; last = 28; swapFlag = true
** Printing dataAry**Entering printDataAry()

Alexis
Jason
Shahan
Angel
Edwin
Talha
Shadman
Gurnoor
Krzysztof
Eunhee
Rajin
Arellano
Piyush
Guo
Ilma
Kaur
Jurgen
Bashir
Jhonatan
Landerer
Mohammed
Patel
Shaharin
Vincenzo
Zhang
Eliyahu
Rajesh
Mandal
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 27; last = 27; swapFlag = true

**** Printing dataAry****Entering printDataAry()

Alexis

Jason

Angel

Edwin

Shahan

Shadman

Gurnoor

Krzysztof

Eunhee

Rajin

Arellano

Piyush

Guo

Ilma

Kaur

Jurgen

Bashir

Jhonatan

Landerer

Mohammed

Patel

Shaharin

Talha

Vincenzo

Eliyahu

Rajesh

Mandal

Zhang

Ziyu

leaving printDataAry()

**** In bubbleSort after one iteration. i = 26; last = 26; swapFlag = true**

**** Printing dataAry****Entering printDataAry()

Alexis

Angel

Edwin

Jason

Shadman

Gurnoor

Krzysztof

Eunhee

Rajin

Arellano

Piyush
Guo
Ilma
Kaur
Jurgen
Bashir
Jhonatan
Landerer
Mohammed
Patel
Shahan
Shaharin
Talha
Eliyahu
Rajesh
Mandal
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 25; last = 25; swapFlag = true

** Printing dataAry**Entering printDataAry()

Alexis
Angel
Edwin
Jason
Gurnoor
Krzysztof
Eunhee
Rajin
Arellano
Piyush
Guo
Ilma
Kaur
Jurgen
Bashir
Jhonatan
Landerer
Mohammed
Patel
Shadman
Shahan

Shaharin
Eliyahu
Rajesh
Mandal
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 24; last = 24; swapFlag = true
** Printing dataAry**Entering printDataAry()

Alexis
Angel
Edwin
Gurnoor
Jason
Eunhee
Krzysztof
Arellano
Piyush
Guo
Ilma
Kaur
Jurgen
Bashir
Jhonatan
Landerer
Mohammed
Patel
Rajin
Shadman
Shahan
Eliyahu
Rajesh
Mandal
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 23; last = 23; swapFlag = true

**** Printing dataAry****Entering printDataAry()

Alexis

Angel

Edwin

Gurnoor

Eunhee

Jason

Arellano

Krzysztof

Guo

Ilma

Kaur

Jurgen

Bashir

Jhonatan

Landerer

Mohammed

Patel

Piyush

Rajin

Shadman

Eliyahu

Rajesh

Mandal

Shahan

Shaharin

Talha

Vincenzo

Zhang

Ziyu

leaving printDataAry()

**** In bubbleSort after one iteration. i = 22; last = 22; swapFlag = true**

**** Printing dataAry****Entering printDataAry()

Alexis

Angel

Edwin

Eunhee

Gurnoor

Arellano

Jason

Guo

Ilma

Kaur

Jurgen
Bashir
Jhonatan
Krzysztof
Landerer
Mohammed
Patel
Piyush
Rajin
Eliyahu
Rajesh
Mandal
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

**** In bubbleSort after one iteration. i = 21; last = 21; swapFlag = true**

**** Printing dataAry****Entering printDataAry()

Alexis
Angel
Edwin
Eunhee
Arellano
Gurnoor
Guo
Ilma
Jason
Jurgen
Bashir
Jhonatan
Kaur
Krzysztof
Landerer
Mohammed
Patel
Piyush
Eliyahu
Rajesh
Mandal

Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 20; last = 20; swapFlag = true
** Printing dataAry**Entering printDataAry()

Alexis
Angel
Edwin
Arellano
Eunhee
Guo
Gurnoor
Ilma
Jason
Bashir
Jhonatan
Jurgen
Kaur
Krzysztof
Landerer
Mohammed
Patel
Eliyahu
Piyush
Mandal
Rajesh
Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 19; last = 19; swapFlag = true

```
** Printing dataAry**Entering printDataAry()
```

Alexis

Angel

Arellano

Edwin

Eunhee

Guo

Gurnoor

Ilma

Bashir

Jason

Jhonatan

Jurgen

Kaur

Krzysztof

Landerer

Mohammed

Eliyahu

Patel

Mandal

Piyush

Rajesh

Rajin

Shadman

Shahan

Shaharin

Talha

Vincenzo

Zhang

Ziyu

```
leaving printDataAry()
```

```
** In bubbleSort after one iteration. i = 18; last = 18; swapFlag = true
```

```
** Printing dataAry**Entering printDataAry()
```

Alexis

Angel

Arellano

Edwin

Eunhee

Guo

Gurnoor

Bashir

Ilma

Jason

Jhonatan
Jurgen
Kaur
Krzysztof
Landerer
Eliyahu
Mohammed
Mandal
Patel
Piyush
Rajesh
Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

**** In bubbleSort after one iteration. i = 17; last = 17; swapFlag = true**

**** Printing dataAry****Entering printDataAry()

Alexis
Angel
Arellano
Edwin
Eunhee
Guo
Bashir
Gurnoor
Ilma
Jason
Jhonatan
Jurgen
Kaur
Krzysztof
Eliyahu
Landerer
Mandal
Mohammed
Patel
Piyush
Rajesh

Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 16; last = 16; swapFlag = true
** Printing dataAry**Entering printDataAry()

Alexis
Angel
Arellano
Edwin
Eunhee
Bashir
Guo
Gurnoor
Ilma
Jason
Jhonatan
Jurgen
Kaur
Eliyahu
Krzysztof
Landerer
Mandal
Mohammed
Patel
Piyush
Rajesh
Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 15; last = 15; swapFlag = true

**** Printing dataAry****Entering printDataAry()

Alexis

Angel

Arellano

Edwin

Bashir

Eunhee

Guo

Gurnoor

Ilma

Jason

Jhonatan

Jurgen

Eliyahu

Kaur

Krzysztof

Landerer

Mandal

Mohammed

Patel

Piyush

Rajesh

Rajin

Shadman

Shahan

Shaharin

Talha

Vincenzo

Zhang

Ziyu

leaving printDataAry()

**** In bubbleSort after one iteration. i = 14; last = 14; swapFlag = true**

**** Printing dataAry****Entering printDataAry()

Alexis

Angel

Arellano

Bashir

Edwin

Eunhee

Guo

Gurnoor

Ilma

Jason

Jhonatan
Eliyahu
Jurgen
Kaur
Krzysztof
Landerer
Mandal
Mohammed
Patel
Piyush
Rajesh
Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

**** In bubbleSort after one iteration. i = 13; last = 13; swapFlag = true**

**** Printing dataAry****Entering printDataAry()

Alexis
Angel
Arellano
Bashir
Edwin
Eunhee
Guo
Gurnoor
Ilma
Jason
Eliyahu
Jhonatan
Jurgen
Kaur
Krzysztof
Landerer
Mandal
Mohammed
Patel
Piyush
Rajesh

Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 12; last = 12; swapFlag = true
** Printing dataAry**Entering printDataAry()

Alexis
Angel
Arellano
Bashir
Edwin
Eunhee
Guo
Gurnoor
Ilma
Eliyahu
Jason
Jhonatan
Jurgen
Kaur
Krzysztof
Landerer
Mandal
Mohammed
Patel
Piyush
Rajesh
Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 11; last = 11; swapFlag = true

**** Printing dataAry****Entering printDataAry()

Alexis

Angel

Arellano

Bashir

Edwin

Eunhee

Guo

Gurnoor

Eliyahu

Ilma

Jason

Jhonatan

Jurgen

Kaur

Krzysztof

Landerer

Mandal

Mohammed

Patel

Piyush

Rajesh

Rajin

Shadman

Shahan

Shaharin

Talha

Vincenzo

Zhang

Ziyu

leaving printDataAry()

**** In bubbleSort after one iteration. i = 10; last = 10; swapFlag = true**

**** Printing dataAry****Entering printDataAry()

Alexis

Angel

Arellano

Bashir

Edwin

Eunhee

Guo

Eliyahu

Gurnoor

Ilma

Jason
Jhonatan
Jurgen
Kaur
Krzysztof
Landerer
Mandal
Mohammed
Patel
Piyush
Rajesh
Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 9; last = 9; swapFlag = true

** Printing dataAry**Entering printDataAry()

Alexis
Angel
Arellano
Bashir
Edwin
Eunhee
Eliyahu
Guo
Gurnoor
Ilma
Jason
Jhonatan
Jurgen
Kaur
Krzysztof
Landerer
Mandal
Mohammed
Patel
Piyush
Rajesh

Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 8; last = 8; swapFlag = true

** Printing dataAry**Entering printDataAry()

Alexis
Angel
Arellano
Bashir
Edwin
Eliyahu
Eunhee
Guo
Gurnoor
Ilma
Jason
Jhonatan
Jurgen
Kaur
Krzysztof
Landerer
Mandal
Mohammed
Patel
Piyush
Rajesh
Rajin
Shadman
Shahan
Shaharin
Talha
Vincenzo
Zhang
Ziyu
leaving printDataAry()

** In bubbleSort after one iteration. i = 7; last = 7; swapFlag = false

**** Printing dataAry****Entering printDataAry()

Alexis

Angel

Arellano

Bashir

Edwin

Eliyahu

Eunhee

Guo

Gurnoor

Ilma

Jason

Jhonatan

Jurgen

Kaur

Krzysztof

Landerer

Mandal

Mohammed

Patel

Piyush

Rajesh

Rajin

Shadman

Shahan

Shaharin

Talha

Vincenzo

Zhang

Ziyu

leaving printDataAry()

leaving bubbleSort ()

Entering printDataAry()

leaving printDataAry()