SlistMergeSort.java

------------START---------------------

a =

---------SORT1 Start------------

# n = 0

# num compare(C) = 0

# num swap(S) = 0

# C+S = 0

Zero elements in array

---------SORT1 End---------------

a = 15

---------SORT1 Start------------

15->NIL

# n = 1

# num compare(C) = 0

# num swap(S) = 0

# C+S = 0

T(n)=(C+S)/(n)= 0.0(n)

# nlogn = 0.0

# n\*n = 1

T(n)=(C+S)/(n^2)= 0.0(n^2)

---------SORT1 End---------------

a = 15 5

---------SORT1 Start------------

before partition a = 15->5->NIL

after partition a = 15->NIL

after partition b = 5->NIL

after merge = 5->15->NIL

5->15->NIL

# n = 2

# num compare(C) = 1

# num swap(S) = 1

# C+S = 2

T(n)=(C+S)/(n)= 1.0(n)

# nlogn = 2.0

T(n)=(C+S)/(nlogn)= 1.0(n\*logn)

# n\*n = 4

T(n)=(C+S)/(n^2)= 0.5(n^2)

---------SORT1 End---------------

a = 15 5 64 8 12 11 4 35

---------SORT1 Start------------

before partition a = 15->5->64->8->12->11->4->35->NIL

after partition a = 15->5->64->8->NIL

after partition b = 12->11->4->35->NIL

before partition a = 15->5->64->8->NIL

after partition a = 15->5->NIL

after partition b = 64->8->NIL

before partition a = 15->5->NIL

after partition a = 15->NIL

after partition b = 5->NIL

after merge = 5->15->NIL

before partition a = 64->8->NIL

after partition a = 64->NIL

after partition b = 8->NIL

after merge = 8->64->NIL

after merge = 5->8->15->64->NIL

before partition a = 12->11->4->35->NIL

after partition a = 12->11->NIL

after partition b = 4->35->NIL

before partition a = 12->11->NIL

after partition a = 12->NIL

after partition b = 11->NIL

after merge = 11->12->NIL

before partition a = 4->35->NIL

after partition a = 4->NIL

after partition b = 35->NIL

after merge = 4->35->NIL

after merge = 4->11->12->35->NIL

after merge = 4->5->8->11->12->15->35->64->NIL

4->5->8->11->12->15->35->64->NIL

# n = 8

# num compare(C) = 17

# num swap(S) = 17

# C+S = 34

T(n)=(C+S)/(n)= 4.25(n)

# nlogn = 24.0

T(n)=(C+S)/(nlogn)= 1.4166666666666667(n\*logn)

# n\*n = 64

T(n)=(C+S)/(n^2)= 0.53125(n^2)

---------SORT1 End---------------

a = 6 5 4 3 2 1

---------SORT1 Start------------

before partition a = 6->5->4->3->2->1->NIL

after partition a = 6->5->4->NIL

after partition b = 3->2->1->NIL

before partition a = 6->5->4->NIL

after partition a = 6->5->NIL

after partition b = 4->NIL

before partition a = 6->5->NIL

after partition a = 6->NIL

after partition b = 5->NIL

after merge = 5->6->NIL

after merge = 4->5->6->NIL

before partition a = 3->2->1->NIL

after partition a = 3->2->NIL

after partition b = 1->NIL

before partition a = 3->2->NIL

after partition a = 3->NIL

after partition b = 2->NIL

after merge = 2->3->NIL

after merge = 1->2->3->NIL

after merge = 1->2->3->4->5->6->NIL

1->2->3->4->5->6->NIL

# n = 6

# num compare(C) = 7

# num swap(S) = 7

# C+S = 14

T(n)=(C+S)/(n)= 2.3333333333333335(n)

# nlogn = 15.509775004326936

T(n)=(C+S)/(nlogn)= 0.9026565502139304(n\*logn)

# n\*n = 36

T(n)=(C+S)/(n^2)= 0.3888888888888889(n^2)

---------SORT1 End---------------

a = 1 2 3 4 5 6

---------SORT1 Start------------

before partition a = 1->2->3->4->5->6->NIL

after partition a = 1->2->3->NIL

after partition b = 4->5->6->NIL

before partition a = 1->2->3->NIL

after partition a = 1->2->NIL

after partition b = 3->NIL

before partition a = 1->2->NIL

after partition a = 1->NIL

after partition b = 2->NIL

after merge = 1->2->NIL

after merge = 1->2->3->NIL

before partition a = 4->5->6->NIL

after partition a = 4->5->NIL

after partition b = 6->NIL

before partition a = 4->5->NIL

after partition a = 4->NIL

after partition b = 5->NIL

after merge = 4->5->NIL

after merge = 4->5->6->NIL

after merge = 1->2->3->4->5->6->NIL

1->2->3->4->5->6->NIL

# n = 6

# num compare(C) = 9

# num swap(S) = 9

# C+S = 18

T(n)=(C+S)/(n)= 3.0(n)

# nlogn = 15.509775004326936

T(n)=(C+S)/(nlogn)= 1.1605584217036249(n\*logn)

# n\*n = 36

T(n)=(C+S)/(n^2)= 0.5(n^2)

---------SORT1 End---------------

a = 1 1 1 1 1 1

---------SORT1 Start------------

before partition a = 1->1->1->1->1->1->NIL

after partition a = 1->1->1->NIL

after partition b = 1->1->1->NIL

before partition a = 1->1->1->NIL

after partition a = 1->1->NIL

after partition b = 1->NIL

before partition a = 1->1->NIL

after partition a = 1->NIL

after partition b = 1->NIL

after merge = 1->1->NIL

after merge = 1->1->1->NIL

before partition a = 1->1->1->NIL

after partition a = 1->1->NIL

after partition b = 1->NIL

before partition a = 1->1->NIL

after partition a = 1->NIL

after partition b = 1->NIL

after merge = 1->1->NIL

after merge = 1->1->1->NIL

after merge = 1->1->1->1->1->1->NIL

1->1->1->1->1->1->NIL

# n = 6

# num compare(C) = 9

# num swap(S) = 9

# C+S = 18

T(n)=(C+S)/(n)= 3.0(n)

# nlogn = 15.509775004326936

T(n)=(C+S)/(nlogn)= 1.1605584217036249(n\*logn)

# n\*n = 36

T(n)=(C+S)/(n^2)= 0.5(n^2)

---------SORT1 End---------------

a = 3 1 4 1 5 9 2 6 5 3 5 8 9 7 9 3

---------SORT1 Start------------

before partition a = 3->1->4->1->5->9->2->6->5->3->5->8->9->7->9->3->NIL

after partition a = 3->1->4->1->5->9->2->6->NIL

after partition b = 5->3->5->8->9->7->9->3->NIL

before partition a = 3->1->4->1->5->9->2->6->NIL

after partition a = 3->1->4->1->NIL

after partition b = 5->9->2->6->NIL

before partition a = 3->1->4->1->NIL

after partition a = 3->1->NIL

after partition b = 4->1->NIL

before partition a = 3->1->NIL

after partition a = 3->NIL

after partition b = 1->NIL

after merge = 1->3->NIL

before partition a = 4->1->NIL

after partition a = 4->NIL

after partition b = 1->NIL

after merge = 1->4->NIL

after merge = 1->1->3->4->NIL

before partition a = 5->9->2->6->NIL

after partition a = 5->9->NIL

after partition b = 2->6->NIL

before partition a = 5->9->NIL

after partition a = 5->NIL

after partition b = 9->NIL

after merge = 5->9->NIL

before partition a = 2->6->NIL

after partition a = 2->NIL

after partition b = 6->NIL

after merge = 2->6->NIL

after merge = 2->5->6->9->NIL

after merge = 1->1->2->3->4->5->6->9->NIL

before partition a = 5->3->5->8->9->7->9->3->NIL

after partition a = 5->3->5->8->NIL

after partition b = 9->7->9->3->NIL

before partition a = 5->3->5->8->NIL

after partition a = 5->3->NIL

after partition b = 5->8->NIL

before partition a = 5->3->NIL

after partition a = 5->NIL

after partition b = 3->NIL

after merge = 3->5->NIL

before partition a = 5->8->NIL

after partition a = 5->NIL

after partition b = 8->NIL

after merge = 5->8->NIL

after merge = 3->5->5->8->NIL

before partition a = 9->7->9->3->NIL

after partition a = 9->7->NIL

after partition b = 9->3->NIL

before partition a = 9->7->NIL

after partition a = 9->NIL

after partition b = 7->NIL

after merge = 7->9->NIL

before partition a = 9->3->NIL

after partition a = 9->NIL

after partition b = 3->NIL

after merge = 3->9->NIL

after merge = 3->7->9->9->NIL

after merge = 3->3->5->5->7->8->9->9->NIL

after merge = 1->1->2->3->3->3->4->5->5->5->6->7->8->9->9->9->NIL

1->1->2->3->3->3->4->5->5->5->6->7->8->9->9->9->NIL

# n = 16

# num compare(C) = 44

# num swap(S) = 44

# C+S = 88

T(n)=(C+S)/(n)= 5.5(n)

# nlogn = 64.0

T(n)=(C+S)/(nlogn)= 1.375(n\*logn)

# n\*n = 256

T(n)=(C+S)/(n^2)= 0.34375(n^2)

---------SORT1 End---------------

a =

---------SORT1 Start------------

# n = 0

# num compare(C) = 0

# num swap(S) = 0

# C+S = 0

Zero elements in array

---------SORT1 End---------------

a = 15

---------SORT1 Start------------

15->NIL

# n = 1

# num compare(C) = 0

# num swap(S) = 0

# C+S = 0

T(n)=(C+S)/(n)= 0.0(n)

# nlogn = 0.0

# n\*n = 1

T(n)=(C+S)/(n^2)= 0.0(n^2)

---------SORT1 End---------------

a = 15 5

---------SORT1 Start------------

before partition a = 15->5->NIL

after partition a = 15->NIL

after partition b = 5->NIL

after merge = 5->15->NIL

15->5->NIL

# n = 2

# num compare(C) = 1

# num swap(S) = 1

# C+S = 2

T(n)=(C+S)/(n)= 1.0(n)

# nlogn = 2.0

T(n)=(C+S)/(nlogn)= 1.0(n\*logn)

# n\*n = 4

T(n)=(C+S)/(n^2)= 0.5(n^2)

---------SORT1 End---------------

a = 15 5 64 8 12 11 4 35

---------SORT1 Start------------

before partition a = 15->5->64->8->12->11->4->35->NIL

after partition a = 15->5->64->8->NIL

after partition b = 12->11->4->35->NIL

before partition a = 15->5->64->8->NIL

after partition a = 15->5->NIL

after partition b = 64->8->NIL

before partition a = 15->5->NIL

after partition a = 15->NIL

after partition b = 5->NIL

after merge = 5->15->NIL

before partition a = 64->8->NIL

after partition a = 64->NIL

after partition b = 8->NIL

after merge = 8->64->NIL

after merge = 5->8->15->64->NIL

before partition a = 12->11->4->35->NIL

after partition a = 12->11->NIL

after partition b = 4->35->NIL

before partition a = 12->11->NIL

after partition a = 12->NIL

after partition b = 11->NIL

after merge = 11->12->NIL

before partition a = 4->35->NIL

after partition a = 4->NIL

after partition b = 35->NIL

after merge = 4->35->NIL

after merge = 4->11->12->35->NIL

after merge = 4->5->8->11->12->15->35->64->NIL

64->35->15->12->11->8->5->4->NIL

# n = 8

# num compare(C) = 17

# num swap(S) = 17

# C+S = 34

T(n)=(C+S)/(n)= 4.25(n)

# nlogn = 24.0

T(n)=(C+S)/(nlogn)= 1.4166666666666667(n\*logn)

# n\*n = 64

T(n)=(C+S)/(n^2)= 0.53125(n^2)

---------SORT1 End---------------

a = 6 5 4 3 2 1

---------SORT1 Start------------

before partition a = 6->5->4->3->2->1->NIL

after partition a = 6->5->4->NIL

after partition b = 3->2->1->NIL

before partition a = 6->5->4->NIL

after partition a = 6->5->NIL

after partition b = 4->NIL

before partition a = 6->5->NIL

after partition a = 6->NIL

after partition b = 5->NIL

after merge = 5->6->NIL

after merge = 4->5->6->NIL

before partition a = 3->2->1->NIL

after partition a = 3->2->NIL

after partition b = 1->NIL

before partition a = 3->2->NIL

after partition a = 3->NIL

after partition b = 2->NIL

after merge = 2->3->NIL

after merge = 1->2->3->NIL

after merge = 1->2->3->4->5->6->NIL

6->5->4->3->2->1->NIL

# n = 6

# num compare(C) = 7

# num swap(S) = 7

# C+S = 14

T(n)=(C+S)/(n)= 2.3333333333333335(n)

# nlogn = 15.509775004326936

T(n)=(C+S)/(nlogn)= 0.9026565502139304(n\*logn)

# n\*n = 36

T(n)=(C+S)/(n^2)= 0.3888888888888889(n^2)

---------SORT1 End---------------

a = 1 2 3 4 5 6

---------SORT1 Start------------

before partition a = 1->2->3->4->5->6->NIL

after partition a = 1->2->3->NIL

after partition b = 4->5->6->NIL

before partition a = 1->2->3->NIL

after partition a = 1->2->NIL

after partition b = 3->NIL

before partition a = 1->2->NIL

after partition a = 1->NIL

after partition b = 2->NIL

after merge = 1->2->NIL

after merge = 1->2->3->NIL

before partition a = 4->5->6->NIL

after partition a = 4->5->NIL

after partition b = 6->NIL

before partition a = 4->5->NIL

after partition a = 4->NIL

after partition b = 5->NIL

after merge = 4->5->NIL

after merge = 4->5->6->NIL

after merge = 1->2->3->4->5->6->NIL

6->5->4->3->2->1->NIL

# n = 6

# num compare(C) = 9

# num swap(S) = 9

# C+S = 18

T(n)=(C+S)/(n)= 3.0(n)

# nlogn = 15.509775004326936

T(n)=(C+S)/(nlogn)= 1.1605584217036249(n\*logn)

# n\*n = 36

T(n)=(C+S)/(n^2)= 0.5(n^2)

---------SORT1 End---------------

a = 1 1 1 1 1 1

---------SORT1 Start------------

before partition a = 1->1->1->1->1->1->NIL

after partition a = 1->1->1->NIL

after partition b = 1->1->1->NIL

before partition a = 1->1->1->NIL

after partition a = 1->1->NIL

after partition b = 1->NIL

before partition a = 1->1->NIL

after partition a = 1->NIL

after partition b = 1->NIL

after merge = 1->1->NIL

after merge = 1->1->1->NIL

before partition a = 1->1->1->NIL

after partition a = 1->1->NIL

after partition b = 1->NIL

before partition a = 1->1->NIL

after partition a = 1->NIL

after partition b = 1->NIL

after merge = 1->1->NIL

after merge = 1->1->1->NIL

after merge = 1->1->1->1->1->1->NIL

1->1->1->1->1->1->NIL

# n = 6

# num compare(C) = 9

# num swap(S) = 9

# C+S = 18

T(n)=(C+S)/(n)= 3.0(n)

# nlogn = 15.509775004326936

T(n)=(C+S)/(nlogn)= 1.1605584217036249(n\*logn)

# n\*n = 36

T(n)=(C+S)/(n^2)= 0.5(n^2)

---------SORT1 End---------------

a = 3 1 4 1 5 9 2 6 5 3 5 8 9 7 9 3

---------SORT1 Start------------

before partition a = 3->1->4->1->5->9->2->6->5->3->5->8->9->7->9->3->NIL

after partition a = 3->1->4->1->5->9->2->6->NIL

after partition b = 5->3->5->8->9->7->9->3->NIL

before partition a = 3->1->4->1->5->9->2->6->NIL

after partition a = 3->1->4->1->NIL

after partition b = 5->9->2->6->NIL

before partition a = 3->1->4->1->NIL

after partition a = 3->1->NIL

after partition b = 4->1->NIL

before partition a = 3->1->NIL

after partition a = 3->NIL

after partition b = 1->NIL

after merge = 1->3->NIL

before partition a = 4->1->NIL

after partition a = 4->NIL

after partition b = 1->NIL

after merge = 1->4->NIL

after merge = 1->1->3->4->NIL

before partition a = 5->9->2->6->NIL

after partition a = 5->9->NIL

after partition b = 2->6->NIL

before partition a = 5->9->NIL

after partition a = 5->NIL

after partition b = 9->NIL

after merge = 5->9->NIL

before partition a = 2->6->NIL

after partition a = 2->NIL

after partition b = 6->NIL

after merge = 2->6->NIL

after merge = 2->5->6->9->NIL

after merge = 1->1->2->3->4->5->6->9->NIL

before partition a = 5->3->5->8->9->7->9->3->NIL

after partition a = 5->3->5->8->NIL

after partition b = 9->7->9->3->NIL

before partition a = 5->3->5->8->NIL

after partition a = 5->3->NIL

after partition b = 5->8->NIL

before partition a = 5->3->NIL

after partition a = 5->NIL

after partition b = 3->NIL

after merge = 3->5->NIL

before partition a = 5->8->NIL

after partition a = 5->NIL

after partition b = 8->NIL

after merge = 5->8->NIL

after merge = 3->5->5->8->NIL

before partition a = 9->7->9->3->NIL

after partition a = 9->7->NIL

after partition b = 9->3->NIL

before partition a = 9->7->NIL

after partition a = 9->NIL

after partition b = 7->NIL

after merge = 7->9->NIL

before partition a = 9->3->NIL

after partition a = 9->NIL

after partition b = 3->NIL

after merge = 3->9->NIL

after merge = 3->7->9->9->NIL

after merge = 3->3->5->5->7->8->9->9->NIL

after merge = 1->1->2->3->3->3->4->5->5->5->6->7->8->9->9->9->NIL

9->9->9->8->7->6->5->5->5->4->3->3->3->2->1->1->NIL

# n = 16

# num compare(C) = 44

# num swap(S) = 44

# C+S = 88

T(n)=(C+S)/(n)= 5.5(n)

# nlogn = 64.0

T(n)=(C+S)/(nlogn)= 1.375(n\*logn)

# n\*n = 256

T(n)=(C+S)/(n^2)= 0.34375(n^2)

---------SORT1 End---------------

---------SORT1 Start------------

# n = 10000

# num compare(C) = 120450

# num swap(S) = 120450

# C+S = 240900

T(n)=(C+S)/(n)= 24.09(n)

# nlogn = 132877.1237954945

T(n)=(C+S)/(nlogn)= 1.8129531488863266(n\*logn)

# n\*n = 100000000

T(n)=(C+S)/(n^2)= 0.002409(n^2)

---------SORT1 End---------------

---------SORT1 Start------------

# n = 20000

# num compare(C) = 260902

# num swap(S) = 260902

# C+S = 521804

T(n)=(C+S)/(n)= 26.0902(n)

# nlogn = 285754.247590989

T(n)=(C+S)/(nlogn)= 1.8260585954504447(n\*logn)

# n\*n = 400000000

T(n)=(C+S)/(n^2)= 0.00130451(n^2)

---------SORT1 End---------------

---------SORT1 Start------------

# n = 30000

# num compare(C) = 408602

# num swap(S) = 408602

# C+S = 817204

T(n)=(C+S)/(n)= 27.240133333333333(n)

# nlogn = 446180.2464081182

T(n)=(C+S)/(nlogn)= 1.8315557593119187(n\*logn)

# n\*n = 900000000

T(n)=(C+S)/(n^2)= 9.080044444444445E-4(n^2)

---------SORT1 End---------------

---------SORT1 Start------------

# n = 40000

# num compare(C) = 561665

# num swap(S) = 561665

# C+S = 1123330

T(n)=(C+S)/(n)= 28.08325(n)

# nlogn = 611508.495181978

T(n)=(C+S)/(nlogn)= 1.836981838928844(n\*logn)

# n\*n = 1600000000

T(n)=(C+S)/(n^2)= 7.0208125E-4(n^2)

---------SORT1 End---------------

---------SORT1 Start------------

# n = 10001

# num compare(C) = 120453

# num swap(S) = 120453

# C+S = 240906

T(n)=(C+S)/(n)= 24.08819118088191(n)

# nlogn = 132891.85427504728

T(n)=(C+S)/(nlogn)= 1.8127973404705078(n\*logn)

# n\*n = 100020001

T(n)=(C+S)/(n^2)= 0.002408578260262165(n^2)

---------SORT1 End---------------

---------SORT1 Start------------

# n = 20001

# num compare(C) = 260923

# num swap(S) = 260923

# C+S = 521846

T(n)=(C+S)/(n)= 26.09099545022749(n)

# nlogn = 285769.9780344762

T(n)=(C+S)/(nlogn)= 1.826105049905007(n\*logn)

# n\*n = 400040001

T(n)=(C+S)/(n^2)= 0.0013044845482839602(n^2)

---------SORT1 End---------------

---------SORT1 Start------------

# n = 30001

# num compare(C) = 408533

# num swap(S) = 408533

# C+S = 817066

T(n)=(C+S)/(n)= 27.234625512482918(n)

# nlogn = 446196.561802084

T(n)=(C+S)/(nlogn)= 1.8311795068524526(n\*logn)

# n\*n = 900060001

T(n)=(C+S)/(n^2)= 9.077905907297395E-4(n^2)

---------SORT1 End---------------

---------SORT1 Start------------

# n = 40001

# num compare(C) = 561726

# num swap(S) = 561726

# C+S = 1123452

T(n)=(C+S)/(n)= 28.0855978600535(n)

# nlogn = 611525.225607432

T(n)=(C+S)/(nlogn)= 1.8371310829967282(n\*logn)

# n\*n = 1600080001

T(n)=(C+S)/(n^2)= 7.021223934415014E-4(n^2)

---------SORT1 End---------------

------------testing 5001 SORTED ASCENDING numbers----------

---------SORT1 Start------------

# n = 5001

# num compare(C) = 32013

# num swap(S) = 32013

# C+S = 64026

T(n)=(C+S)/(n)= 12.802639472105579(n)

# nlogn = 61452.29244942758

T(n)=(C+S)/(nlogn)= 1.041881392019516(n\*logn)

# n\*n = 25010001

T(n)=(C+S)/(n^2)= 0.0025600158912428674(n^2)

---------SORT1 End---------------

------------testing 10001 SORTED ASCENDING numbers----------

---------SORT1 Start------------

# n = 10001

# num compare(C) = 69018

# num swap(S) = 69018

# C+S = 138036

T(n)=(C+S)/(n)= 13.802219778022197(n)

# nlogn = 132891.85427504728

T(n)=(C+S)/(nlogn)= 1.0387092629041494(n\*logn)

# n\*n = 100020001

T(n)=(C+S)/(n^2)= 0.0013800839694052792(n^2)

---------SORT1 End---------------

------------testing 15001 SORTED ASCENDING numbers----------

---------SORT1 Start------------

# n = 15001

# num compare(C) = 106372

# num swap(S) = 106372

# C+S = 212744

T(n)=(C+S)/(n)= 14.181987867475502(n)

# nlogn = 208105.43862206902

T(n)=(C+S)/(nlogn)= 1.0222894769528579(n\*logn)

# n\*n = 225030001

T(n)=(C+S)/(n^2)= 9.454028309763017E-4(n^2)

---------SORT1 End---------------

------------testing 20001 SORTED ASCENDING numbers----------

---------SORT1 Start------------

# n = 20001

# num compare(C) = 148027

# num swap(S) = 148027

# C+S = 296054

T(n)=(C+S)/(n)= 14.8019599020049(n)

# nlogn = 285769.9780344762

T(n)=(C+S)/(nlogn)= 1.0359870621688716(n\*logn)

# n\*n = 400040001

T(n)=(C+S)/(n^2)= 7.400609920506424E-4(n^2)

---------SORT1 End---------------

------------testing 25001 SORTED ASCENDING numbers----------

---------SORT1 Start------------

# n = 25001

# num compare(C) = 188486

# num swap(S) = 188486

# C+S = 376972

T(n)=(C+S)/(n)= 15.078276868925244(n)

# nlogn = 365257.06422528916

T(n)=(C+S)/(nlogn)= 1.0320731258122502(n\*logn)

# n\*n = 625050001

T(n)=(C+S)/(n^2)= 6.031069504789906E-4(n^2)

---------SORT1 End---------------

------------DONE!--------

SlistMergeSort.java DONE