The Java Memory Model

(omitting arrays, static variables, and multiple threads)

Stacked Activation Records

Objects within the free-memory store,

Top

Local Variables
Primitives: reference
null
Primitive
null

Local Variables
null
Local Variables
null
Local Variables: reference
null

Primitive
null
Primitive
null

2 objects of different classes

2 objects of the same class.
Merge Sort Project: Memory model

Sorting Engine

original ArrayList

to be sorted?

ArrayList

Scratch ArrayList

First

Second

Each entry in each ArrayList will be either null or a String reference/pointer/location/address
\[
\ln x = \frac{(A + B)}{2}
\]

\[
\frac{\log_6 3}{3} = 53
\]

\[
7 + 10 = \frac{17}{2} = 8.5 \quad \frac{18.5}{1} = 8
\]
int m = (L + R) / 2;

A) Recurse to sort
   A[L...m]
B) Recurse to sort
   A[m+1...R]

C) MERGE(
   L, m, m+1, R)

Hard to code the body of MERGE(int l, int m, int R1, int R2)
MS (leftI, rightI) (leftI <= rightI)

The job of MS (leftI, rightI) depends on ...

? Please sort the range of array list A from index leftI to index rightI

location inclusively.

class SortingEngine

| int nToSort; ArrayList<String> A;
| public void sort() |
| MS (0, nToSort - 1), |
| public SortingEngine (ArrayList<String> X) |
| A = X; nToSort = X.size(); |
| this. A = X; |
MS (leftI, rightI)

Base Case:
if (leftI > rightI) ?
{
   /* nothing */
}
else
{
   complicated stuff
}
\[ MS(306, 312) \]
\[ \left\lfloor \frac{306 + 312}{2} \right\rfloor = 309 \]

Different from MS
Not Recent

\[ MS(306, 309) \]
\[ MS(310, 312) \]

\[ MS(310, 309) \]
\[ MS(309, 309) \]

\[ MS(310, 311) \]

\[ MS(312, 312) \]

\[ MS(310, 311) \]

\[ MS(311, 311) \]
MERGE(306, 309, 310, 312)

(A, B, C, D) \times 1 (\times 1)

Scratch:

(\text{Varibbles/Profe First!})

2. Trash your laptop!
NOTES FROM LECTURE: Will be cleaned up in next 24 hrs.

STACK (illustrated)