SORTING ALGORITHMS Bubble Sort:

Theory:

Let us assume a set of elements

20, 35, -15, 7, 55, 1, -22 + Indices

I Consider a variable "Last Unsorted Index" that tracks till where the array has been sorted

Now, the array is not sorted yet, therefore the last Unsorted Index = 6

is initialized to Tomosovisol world which

20 35 -15 7 55 1 - 22

1 2 3 4 5 6

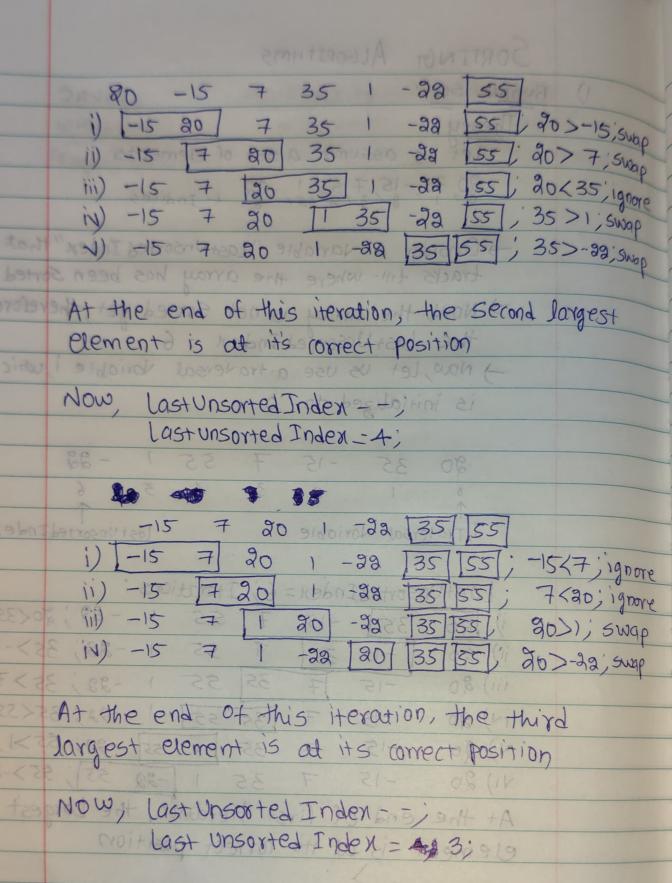
1 Transported Index

Last Unsorted Index = 6; Iterations:

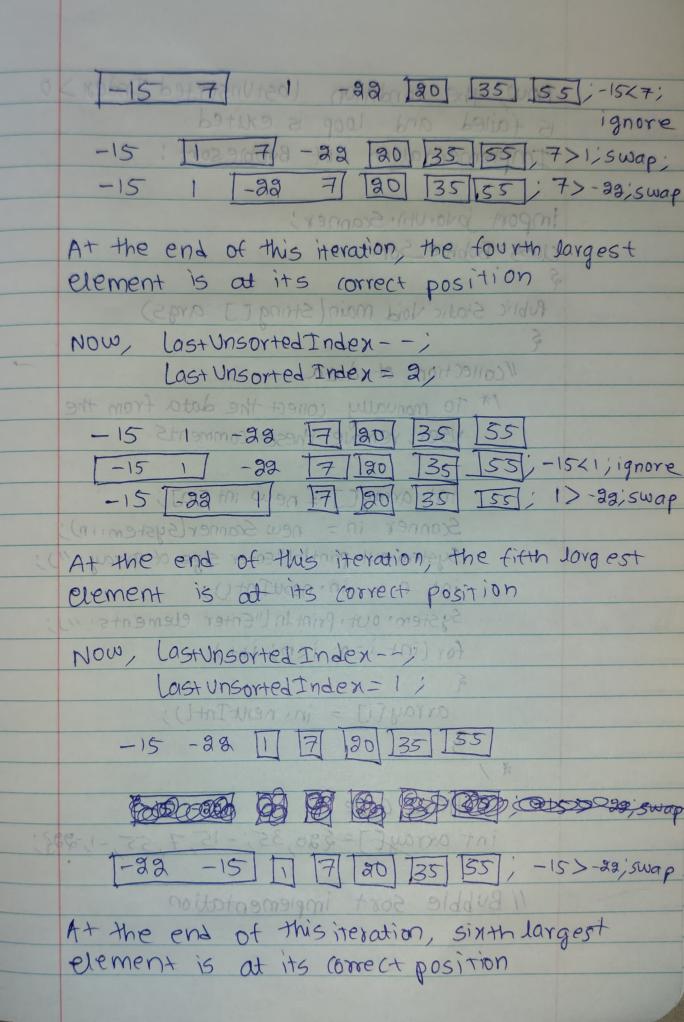
i) 20 35 - 15 7 55 1 - 22; 35>-15; swap
ii) 20 -15 35 7 55 1 - 22; 35>7; swap
iii) 20 -15 7 35 55 1 - 22; 35>7; swap
iv) 20 -15 7 35 55 1 - 22; 55>1; swap
vi) 20 -15 7 35 1 - 22; 55>1; swap
vi) 20 -15 7 35 1 - 22; 55>1; swap
At the end of first iteration, the Largest

At the end of first iteration, the Largest element is at it's correct position

Now, Last Unsorted Index = 5;



-15 - - 7x96176-88 2 130 35 155



Now, the condition last unsorted Index 20 is failed and loop is exited. Implementation of Bubblesort: import java. Util. Scanner; class Bubble_Sort man ent to bord and and element is of its invert pos Public Static Void main (String [] args) 1/ collection of databatroady real 1* To manually collect the data from the user, remove these comments int array[] = new int [10]; Scanner in = new Scanner (Systemin); System out printlnl"Enter size of array: "); int n = vin nextIntu; System out Print In l'Enter elements: 11); for (int i=0; ixp; +itt) (Head work CAST VINSONTEGINARY array[i] = in. nextIntl); 3 11 Hard Code int array[]= \$20,35,-15,7,55,-1,-223; 1/ Bubble sort implementation A+ the end of this iteration, sixth largest element is at its correct position

```
for (int Lastunsorted Index = array. Length - 1;
 last Unsorted Index >0; Last Unsorted Index - )
   for (int i=0; i < last Unsorted Index; i++)
       if (array [i] > array [i+1])
          Swap (array, i, i+1);
          311if
   3 11 sinner for
   3 11 outer for
1/ Printing elements using for each loop for (int element: array)
  system out print In ( element);
  3 11 for
311 main
Public Static void Swap (int [] array inti, inti)
   if (i = = i) & return; 3
 int temp = array[i];

array[i] = array[j];

array[i] = temp;

3 11 swap
3 aass - Bubble sort.
```