

HW 4 asks you to write code to carry out the "bubble sort" algorithm - today we discussed the pseudo-code at Wikipedia for the bubble sort

https://en.wikipedia.org/wiki/Bubble_sort

FINISH 1st TIME THROUGH INNER REPEAT
AFTER COMPARE LAST PAIR

AFTER COMPARE 1st PAIR, NOW COMPARE 2nd PAIR

START

FLAG VARIABLE SIGNAL FLAGS
 0 F
 1 T
 SIGNALS STATE OF PROGRAM

SO START OVER AGAIN WITH TOP PAIR IN 2nd TIME THROUGH OUTER REPEAT

SO SORT 50 SMALLEST # 1st BUBBLE SORT

Sorted = FALSE
 REPEAT WHILE Sorted == FALSE
 Sorted = TRUE
 COMPARE EACH PAIR OF #S ← REPEAT

- IF NOT IN CORRECT ORDER → ELEMENT $i > \text{ELEM}(i-1)$
 THEN "SWAP" THEM & Sorted = FALSE

END
 END

Diagram showing the progression of an array [85, 40, 61, 5, 100] through comparisons and swaps:

- Initial array: [85, 40, 61, 5, 100]
- Step 1: [85, 40, 61, 5, 100] → [85, 40, 100, 61, 5] (swap 61 and 100)
- Step 2: [85, 40, 100, 61, 5] → [85, 40, 100, 5, 61] (swap 61 and 5)
- Step 3: [85, 40, 100, 5, 61] → [85, 100, 40, 5, 61] (swap 40 and 100)
- Step 4: [85, 100, 40, 5, 61] → [85, 100, 5, 40, 61] (swap 40 and 5)
- Step 5: [85, 100, 5, 40, 61] → [100, 85, 40, 61, 5] (swap 85 and 100)

How many pairs of #s?
 - LENGTH OF VECTOR - 1
 - HERE 5 - 1 = 4

Swap example for $i=2$:

② 85 A(1) → A(i-1) ① temp
 100 A(2) → A(i) 100
 ③

WANT
 85 A(1)
 100 A(2)

① temp = A(i-1);
 ② A(i-1) = A(i);
 ③ A(i) = temp;