Assignment 9 – Group: Francisco, Victor, Bruno, Yasser

**Exercise 40**

**Analysis:**

INPUT: n – array of integers

OUTPUT: n\_out – array of integers sorted

INTERNAL DATA: i, j – integers

PROCEDURE:

Create an array with 1000 positions. Get the user input for 1000 integers. For each number, verify if the number posterior is larger than the predecessor, if yes, go to the next position, if not, change the position to the smaller number become the predecessor and the larger become the posterior. After all numbers are sorted, display the number in first position (smallest) and the number in the last position (largest).

**PSEUDOCODE:**

VARIABLES:

n – array[1,1000] of int (input)

n\_out – array[1,1000] of int (output)

i – int (temporary)

j – int (temporary)

t – int (temporary)

n\_out – array[1,1000] of int (output)

START

FOR i=1 TO 1000 JUMP 1

WRITE “Enter the number”, i

READ n[i]

n\_out[i] = n[i]

END FOR

FOR i=1 TO 1000 JUMP 1

FOR j=i+1 TO 1000 JUMP 1

IF n[i] > n[j] THEN

t = n\_out[j]

n\_out[j] = n\_out[i]

n\_out[i] = t

END FOR

END FOR

WRITE “The smallest number is”, n\_out[1]

WRITE “The largest number is” , n\_out[1000]

END FOR

**TRACE TABLE**

Example of an input of 4 numbers

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Example: | **input** |  |  |  |  |  |  |  |
|  | n[0] | n[1] | n[2] | n[3] |  |  |  |  |
|  | 4 | 2 | 3 | 5 |  |  |  |  |
|  |  |  |  |  |  |  |  | **Output** |
| i | j | n[i] | n[j] | n[i]>n[j]? | t | n\_out[j] | n\_out[i] | n[4,2,3,5] |
| 0 | 1 | 4 | 2 | yes | 2 | 4 | 2 | n[2,4,3,5] |
| 1 | 2 | 4 | 3 | yes | 3 | 4 | 3 | n[2,3,4,5] |
| 2 | 3 | 4 | 5 | no | \* | \* | \* | n[2,3,4,5] |