Algorithms – Bubble Sort (1B)

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Bubble Sort Algorithm

procedure bubblesort(a_1, … , a_n : real numbers with n ≥ 2)

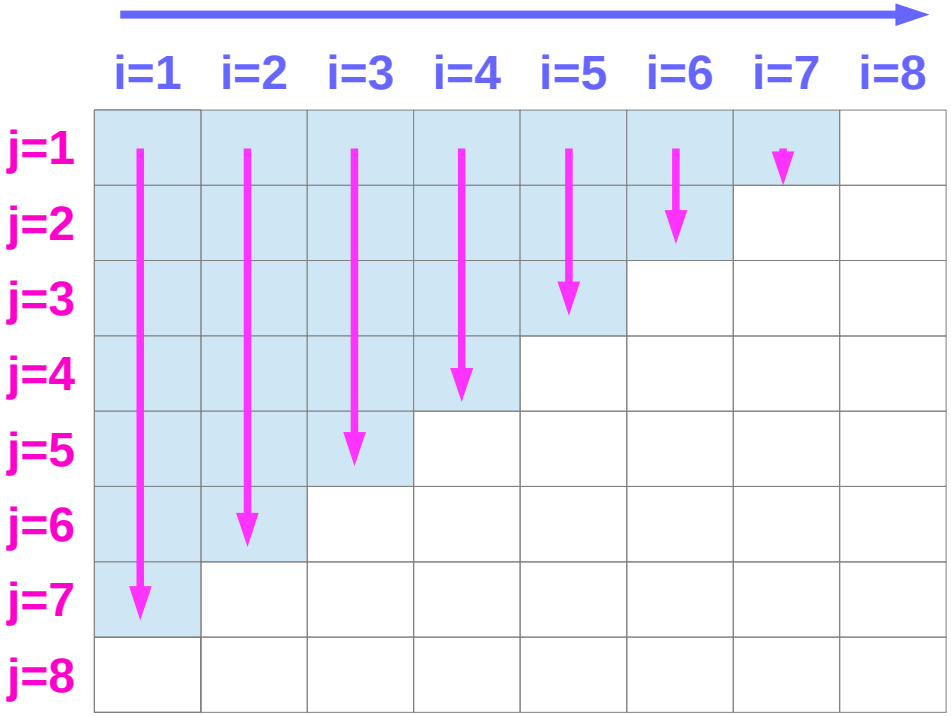
for i := 1 **to** n-1

  for j := 1 **to** n – i

    if a_j > a_{j+1} **then** interchange a_j and a_{j+1}

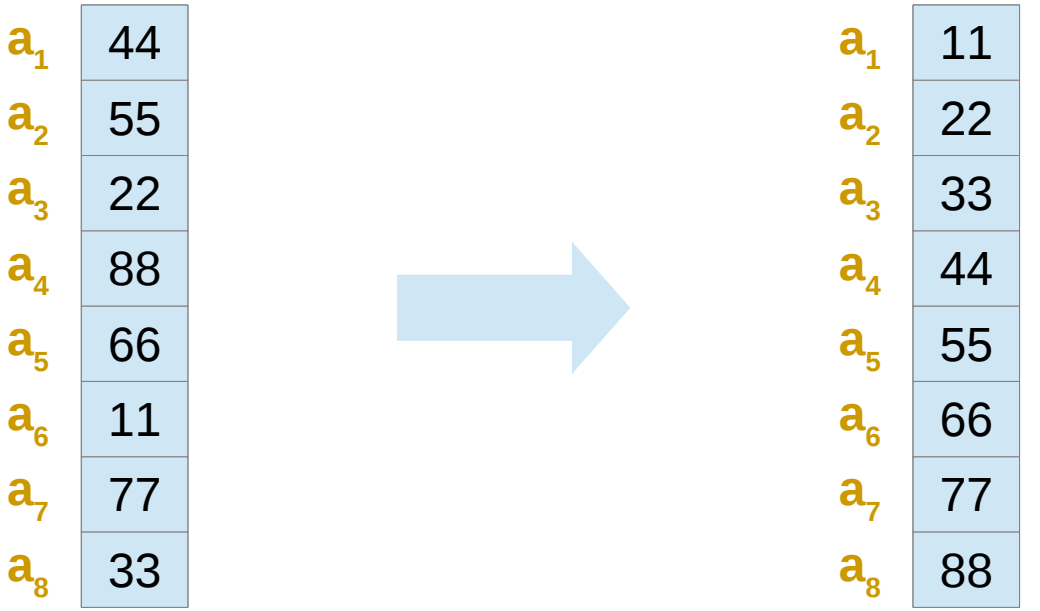
{a_1, …, a_n is in increasing order}

Nested loop iterations




```
for i := 1 to n-1
    for j := 1 to n – i
```

Input and Ouput

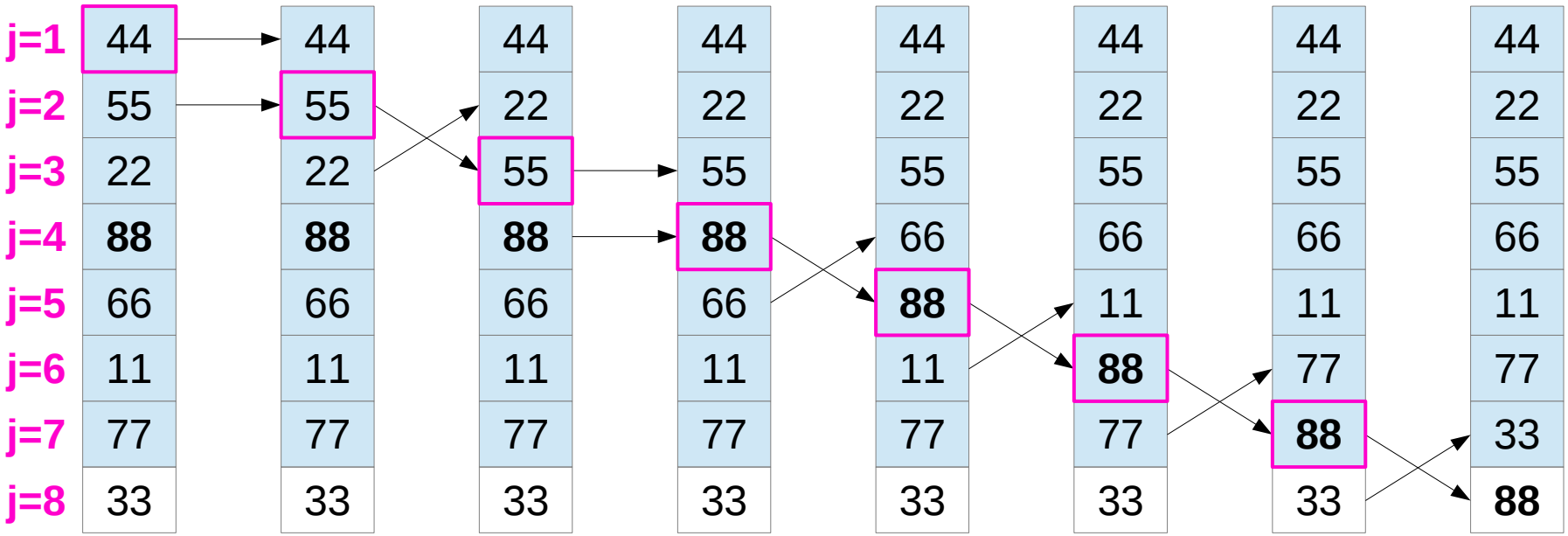


$a_1, \ldots, a_n$: real numbers

with $n \geq 2$

$\{a_1, \ldots, a_n$ is in increasing order$\}$

Step i=1

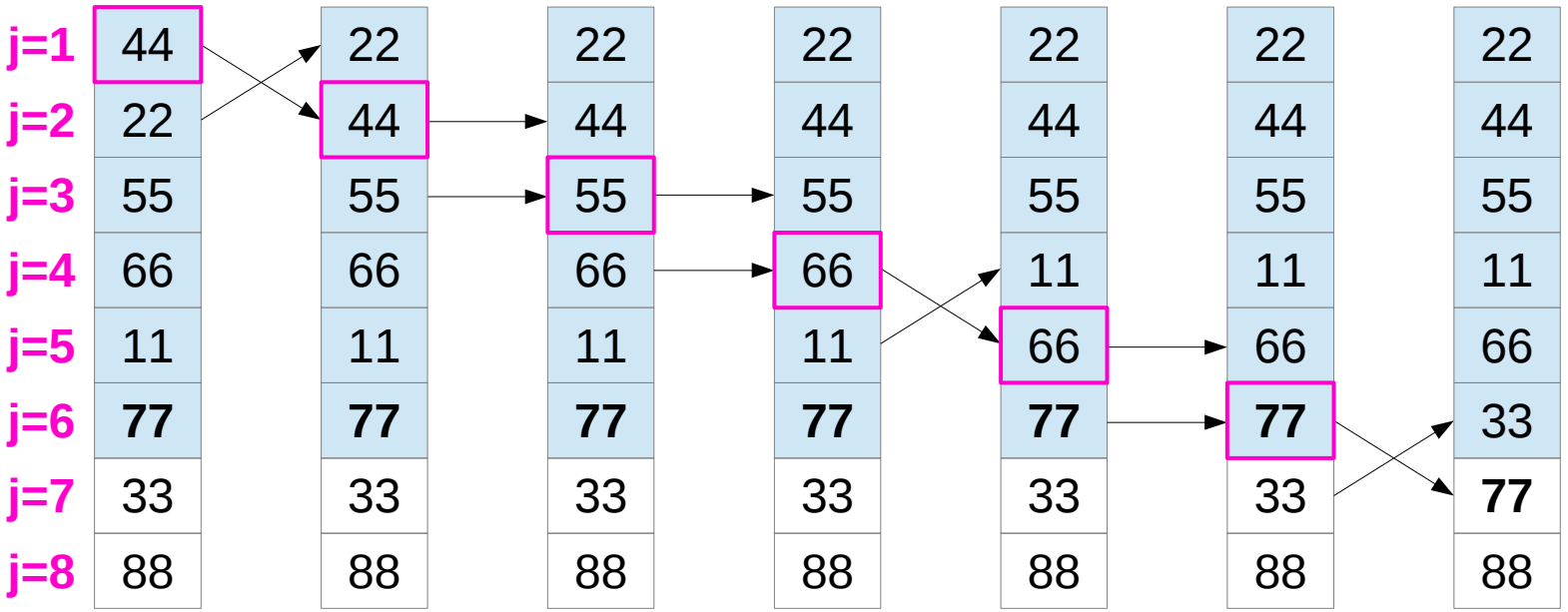


for i := 1 **to** n-1

  for j := 1 **to** n – i

    if $a_j > a_{j+1}$ **then** interchange a_j and a_{j+1}

Step i=2

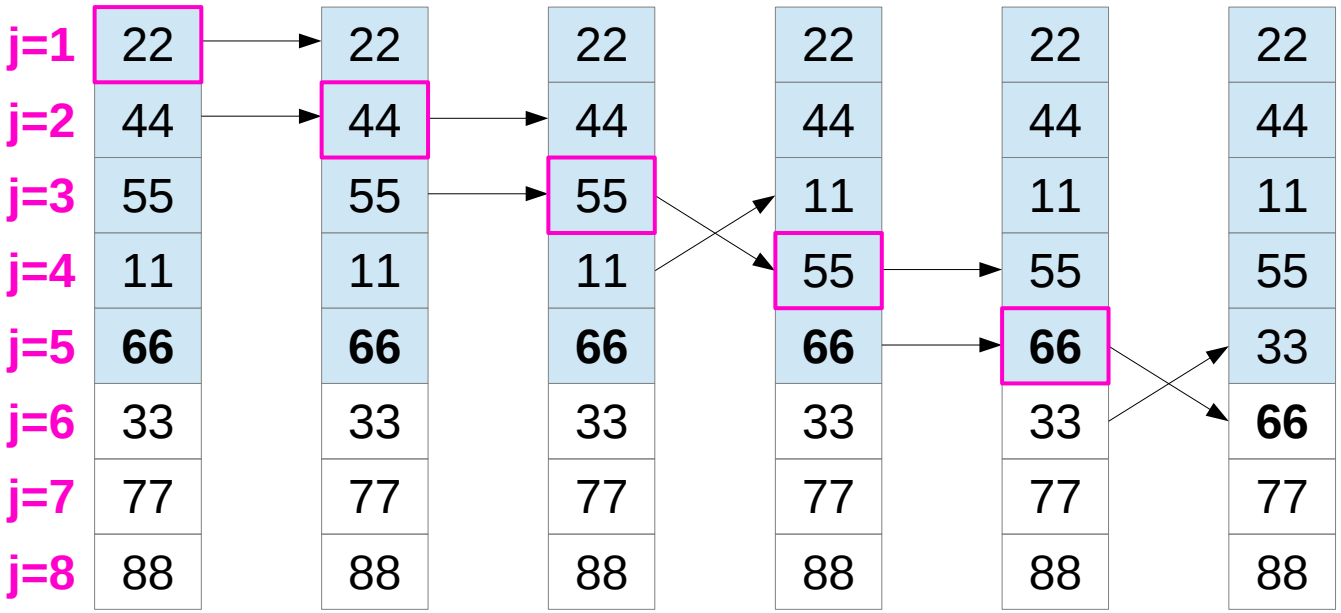


for i := 1 **to** n-1

  for j := 1 **to** n – i

    if $a_j > a_{j+1}$ **then** interchange a_j and a_{j+1}

Step i=3

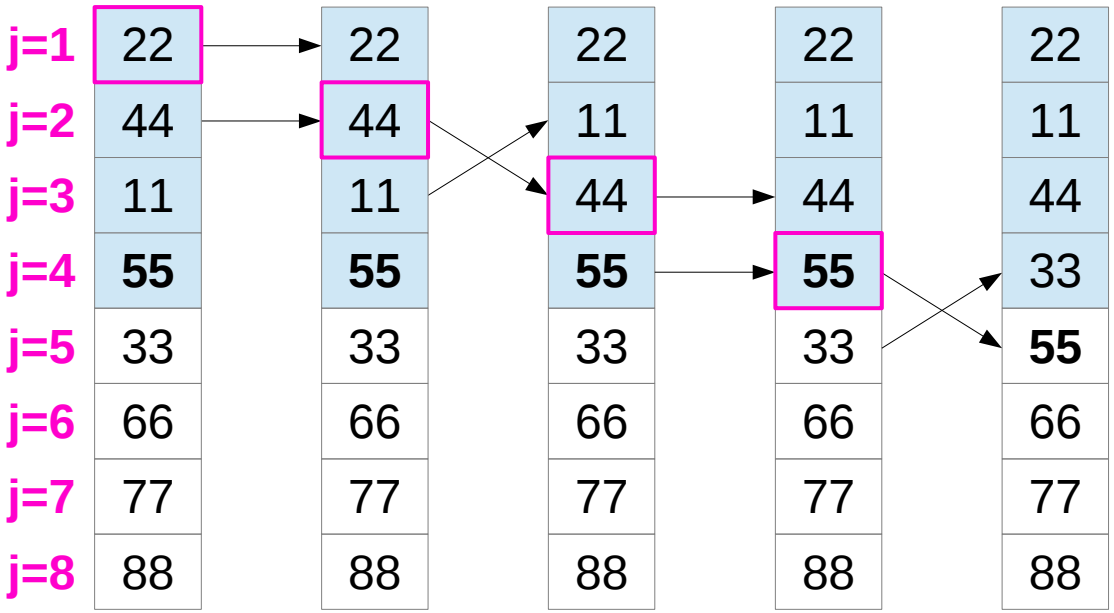


for i := 1 **to** n-1

  for j := 1 **to** n – i

    if $a_j > a_{j+1}$ **then** interchange a_j and a_{j+1}

Step i=4

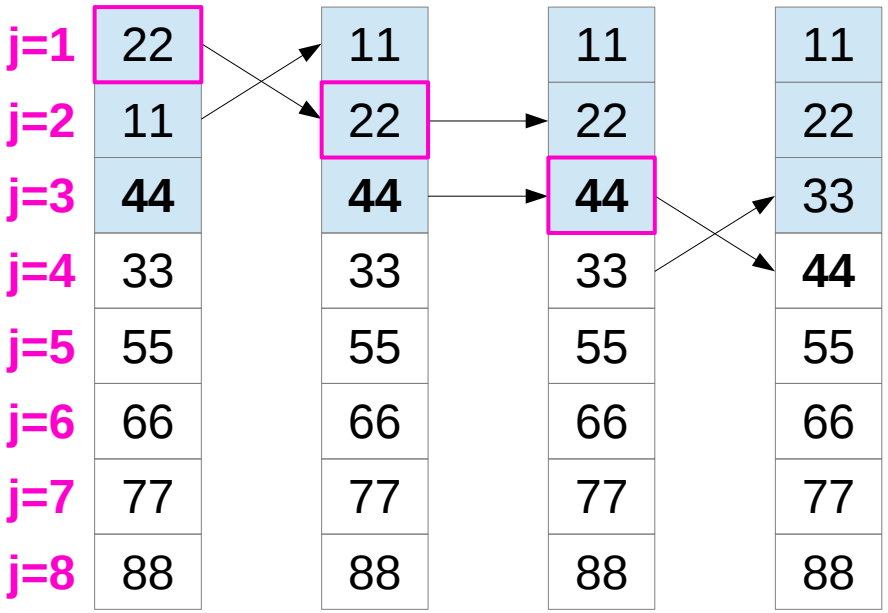


for i := 1 **to** n-1

  for j := 1 **to** n – i

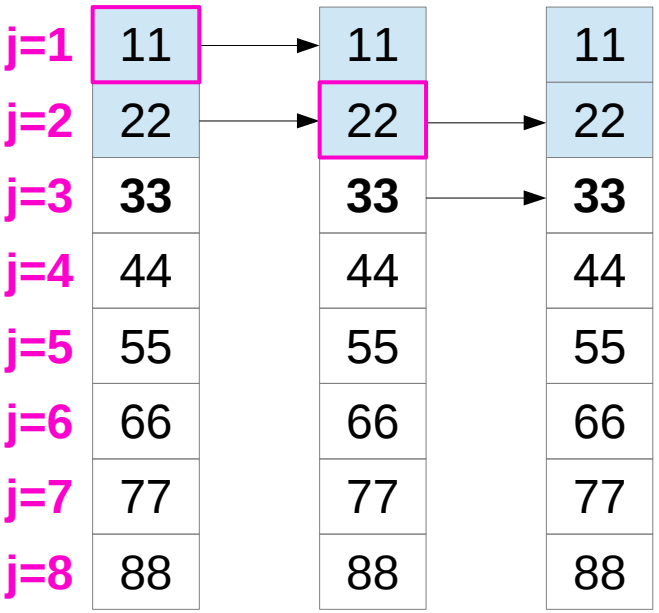
    if $a_j > a_{j+1}$ **then** interchange a_j and a_{j+1}

Step i=5



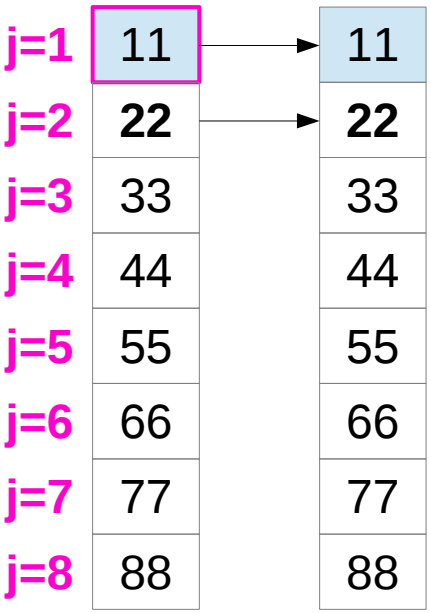

```
for i := 1 to n-1
    for j := 1 to n – i
        if a_j > a_j+1 then interchange a_j and a_j+1
```

Step i=6



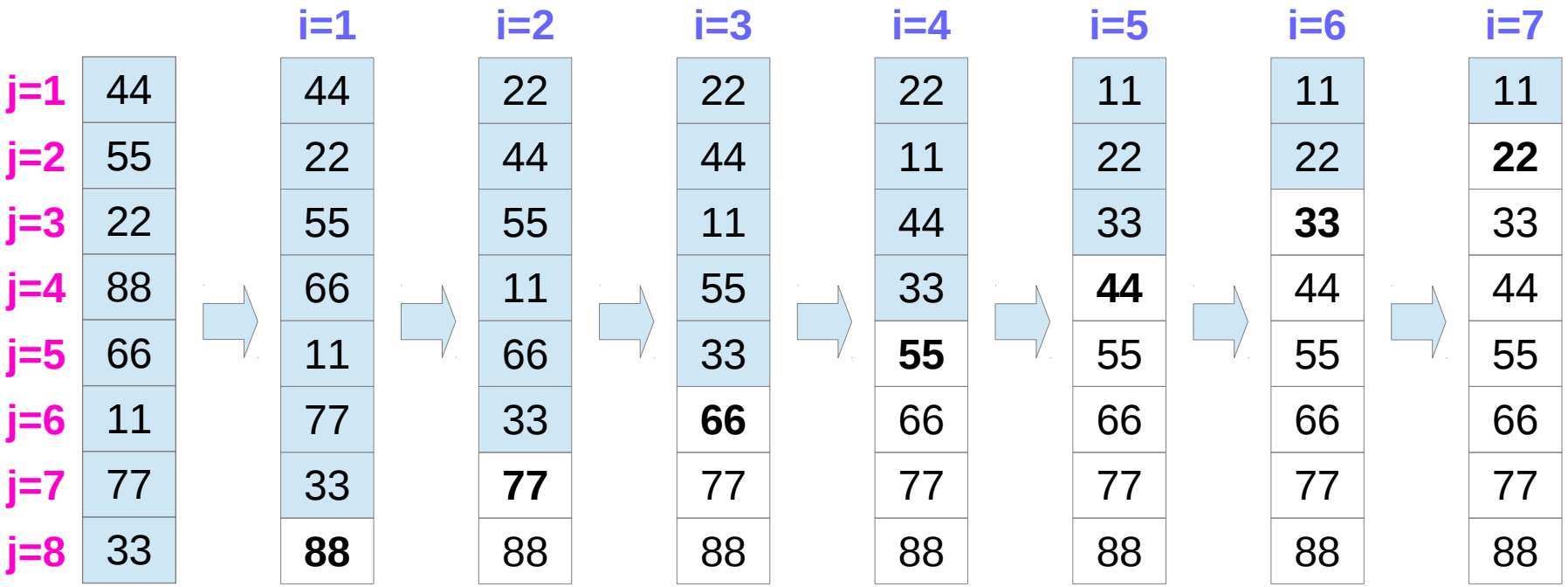

```
for i := 1 to n-1
    for j := 1 to n – i
        if a_j > a_j+1 then interchange a_j and a_j+1
```

Step i=7




```
for i := 1 to n-1
    for j := 1 to n – i
        if a_j > a_j+1 then interchange a_j and a_j+1
```

Summary




```
for i := 1 to n-1
    for j := 1 to n – i
        if a_j > a_j+1 then interchange a_j and a_j+1
```

References

[1] http://en.wikipedia.org/
[2]