

# Προγραμματισμός Η/Υ

**Παύλος Πέππας**

[www.bma.upatras.gr/staff/pavlos/](http://www.bma.upatras.gr/staff/pavlos/)

# Ταξινόμηση με Παρεμβολή

9	2	1	7
---	---	---	---

# Ταξινόμηση με Παρεμβολή

9	2	1	7
---	---	---	---

1η Εισαγωγή

9		1	7
---	--	---	---


el

2
---

# Ταξινόμηση με Παρεμβολή

9	2	1	7
---	---	---	---

1η Εισαγωγή



9		1	7
---	--	---	---

el


2
---

	9	1	7
--	---	---	---

# Ταξινόμηση με Παρεμβολή

9	2	1	7
---	---	---	---

1η Εισαγωγή




9		1	7
---	--	---	---

el

2
---

	9	1	7
--	---	---	---



2	9	1	7
---	---	---	---

# Ταξινόμηση με Παρεμβολή

9	2	1	7
---	---	---	---

## 1η Εισαγωγή

9		1	7
---	--	---	---

el

2
---

	9	1	7
--	---	---	---

2	9	1	7
---	---	---	---

## 2η Εισαγωγή

2	9		7
---	---	--	---

el

1
---

# Ταξινόμηση με Παρεμβολή

9	2	1	7
---	---	---	---

## 1η Εισαγωγή

9		1	7
---	--	---	---

el

2
---

	9	1	7
--	---	---	---

2	9	1	7
---	---	---	---

## 2η Εισαγωγή

2	9		7
---	---	--	---

el

1
---

2		9	7
---	--	---	---

# Ταξινόμηση με Παρεμβολή

9	2	1	7
---	---	---	---

## 1η Εισαγωγή

9		1	7
---	--	---	---

el

2
---

	9	1	7
--	---	---	---

2	9	1	7
---	---	---	---

## 2η Εισαγωγή

2	9		7
---	---	--	---

el

1
---

2		9	7
---	--	---	---

	2	9	7
--	---	---	---



# Ταξινόμηση με Παρεμβολή

9	2	1	7
---	---	---	---

## 1η Εισαγωγή

9		1	7
---	--	---	---

el

2
---

	9	1	7
--	---	---	---

2	9	1	7
---	---	---	---

## 2η Εισαγωγή

2	9		7
---	---	--	---

el

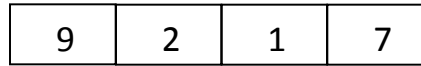
1
---

2		9	7
---	--	---	---

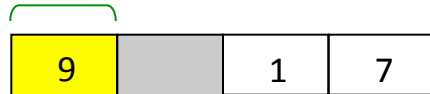
	2	9	7
--	---	---	---

1	2	9	7
---	---	---	---

# Ταξινόμηση με Παρεμβολή



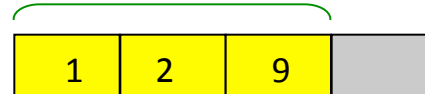
1η Εισαγωγή



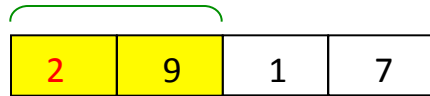
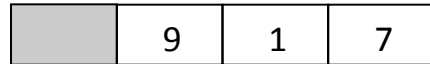
el



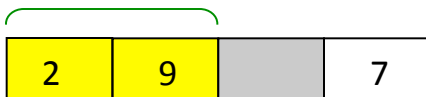
3η Εισαγωγή



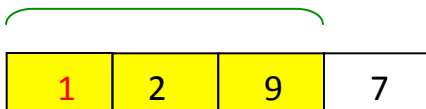
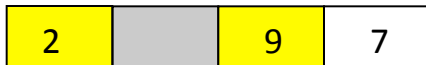
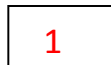
el



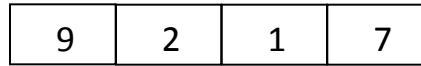
2η Εισαγωγή



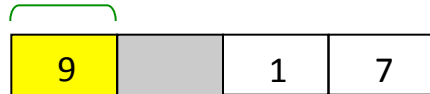
el



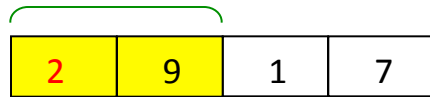
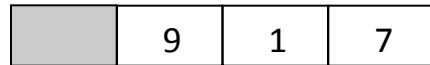
# Ταξινόμηση με Παρεμβολή



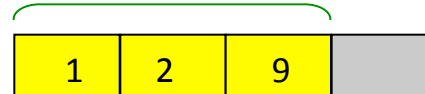
1η Εισαγωγή



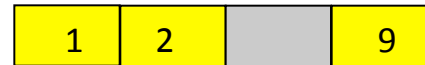
el



3η Εισαγωγή



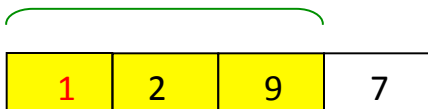
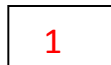
el



2η Εισαγωγή



el



# Ταξινόμηση με Παρεμβολή

9	2	1	7
---	---	---	---

## 1η Εισαγωγή

9		1	7
---	--	---	---

el

2
---

	9	1	7
--	---	---	---

2	9	1	7
---	---	---	---

## 3η Εισαγωγή

1	2	9	
---	---	---	--

el

7
---

1	2		9
---	---	--	---

1	2	7	9
---	---	---	---

## 2η Εισαγωγή

2	9		7
---	---	--	---

el

1
---

2		9	7
---	--	---	---

	2	9	7
--	---	---	---

1	2	9	7
---	---	---	---

# Υλοποίηση InsertionSort σε Java

```
public static void main (String[ ] args)
{
    Scanner input = new Scanner( System.in );
    int x[ ];
    int i, j, el;
    final int n=4;

    x = new int[n];
    System.out.printf("Enter %d integers: ", n);

    for (i=0; i<n; i++)
        x[i] = input.nextInt();
```

```
System.out.println("The sorted array is:");

for (i=0; i<n; i++)
    System.out.printf("%d\t", x[i]);
```

```
}
```

# Υλοποίηση InsertionSort σε Java

```
public static void main (String[ ] args)
{
    Scanner input = new Scanner( System.in );
    int x[ ];
    int i, j, el;
    final int n=4;

    x = new int[n];
    System.out.printf("Enter %d integers: ", n);

    for (i=0; i<n; i++)
        x[i] = input.nextInt();
```

```
        for (i = 1; i<n; i++)
        {
            el = x[i]
            for (j = i-1; ( j>=0) && (x[j] > el) ); j--)
                x[j+1] = x[j];
            x[j+1] = el;
        }

        System.out.println("The sorted array is:");

        for (i=0; i<n; i++)
            System.out.printf("%d\t", x[i]);
    }
```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	9	2	7	1

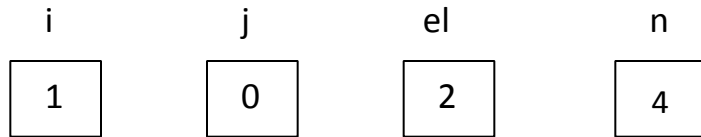
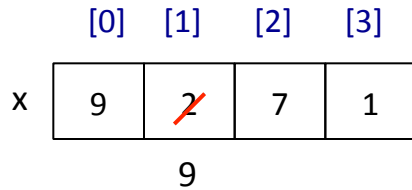
i	j	el	n
1	0	2	4

```
for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

System.out.println("The sorted array is:");

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}
```

# Υλοποίηση InsertionSort σε Java



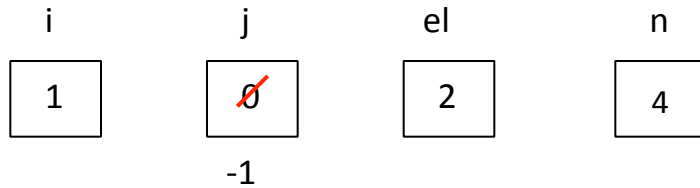
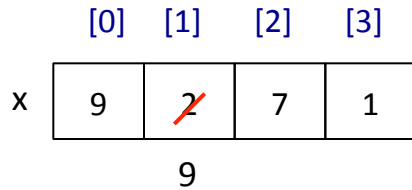
```
for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

System.out.println("The sorted array is:");

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}
```



# Υλοποίηση InsertionSort σε Java



```
for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

System.out.println("The sorted array is:");

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}
```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	7	1
	2	9		

i	j	el	n
1	<del>0</del>	2	4
	-1		

```
for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

System.out.println("The sorted array is:");

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}
```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	7	1
	2	9		

i	j	el	n
<del>1</del>	<del>0</del>	2	4
2	-1		

```
for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

System.out.println("The sorted array is:");

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}
```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	7	1
	2	9		

i	j	el	n
<del>1</del>	<del>0</del>	<del>2</del>	4
2	<del>-1</del>	7	
	1		

```
for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

System.out.println("The sorted array is:");

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}
```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	<del>7</del>	1
	2	9	9	

i	j	el	n
<del>1</del>	<del>0</del>	<del>2</del>	4
2	<del>-1</del>	7	
	1		

```
for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; ( j >= 0) && (x[j] > el) ); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

System.out.println("The sorted array is:");

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}
```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	<del>7</del>	1
	2	9	9	

i	j	el	n
<del>1</del>	<del>0</del>	<del>2</del>	4
2	<del>-1</del>	7	
	<del>1</del>		
	0		

```
for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

System.out.println("The sorted array is:");

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}
```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	<del>7</del>	1
	2	<del>9</del>	9	
		7		

i	j	el	n
<del>1</del>	<del>0</del>	<del>2</del>	4
2	<del>-1</del>	7	
	<del>1</del>		
	0		

```
for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

System.out.println("The sorted array is:");

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}
```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	<del>7</del>	1
	2	<del>9</del>	<b>9</b>	
		7		

i	j	el	n
<del>1</del>	<del>0</del>	<del>2</del>	4
<del>2</del>	<del>-1</del>	<del>7</del>	
3	<del>1</del>	<b>1</b>	
	<del>0</del>		
	2		

```
for (i = 1; i < n; i++)  
{  
    el = x[i]  
    for (j = i - 1; (j >= 0) && (x[j] > el); j--)  
        x[j + 1] = x[j];  
    x[j + 1] = el;  
}  
  
System.out.println("The sorted array is:");  
  
for (i = 0; i < n; i++)  
    System.out.printf("%d\t", x[i]);  
}
```



# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	<del>7</del>	<del>1</del>
	2	<del>9</del>	9	9
		<b>7</b>		

i	j	el	n
<del>1</del>	<del>0</del>	<del>2</del>	4
<del>2</del>	<del>-1</del>	<del>7</del>	
3	<del>1</del>	<b>1</b>	
	<del>0</del>		
	<del>2</del>		
	1		

```
for (i = 1; i < n; i++)  
{  
    el = x[i]  
    for (j = i - 1; (j >= 0) && (x[j] > el); j--)  
        x[j + 1] = x[j];  
    x[j + 1] = el;  
}
```

```
System.out.println("The sorted array is:");
```

```
for (i = 0; i < n; i++)  
    System.out.printf("%d\t", x[i]);
```

```
}
```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	<del>7</del>	<del>1</del>
	2	<del>9</del>	<del>9</del>	9
		7	7	

i	j	el	n
<del>1</del>	<del>0</del>	<del>2</del>	4
<del>2</del>	<del>-1</del>	<del>7</del>	
3	<del>1</del>	1	
	<del>0</del>		
	<del>2</del>		
	<del>1</del>		
	0		

```

for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

```

System.out.println("The sorted array is:");

```

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}

```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	<del>7</del>	<del>1</del>
	2	<del>9</del>	<del>9</del>	9
		<del>7</del>	7	
		2		

i	j	el	n
<del>1</del>	<del>0</del>	<del>2</del>	4
<del>2</del>	<del>-1</del>	<del>7</del>	
3	<del>1</del>	1	
	<del>0</del>		
	<del>2</del>		
	<del>1</del>		
	<del>0</del>		
	-1		

```

for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

```

System.out.println("The sorted array is:");

```

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}

```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	<del>7</del>	<del>1</del>
	<del>2</del>	<del>9</del>	<del>9</del>	9
	1	<del>7</del>	7	
		2		

i	j	el	n
<del>1</del>	<del>0</del>	<del>2</del>	4
<del>2</del>	<del>-1</del>	<del>7</del>	
3	<del>1</del>	1	
	<del>0</del>		
	<del>2</del>		
	<del>1</del>		
	<del>0</del>		
	-1		

```

for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}

```

System.out.println("The sorted array is:");

```

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
}

```

# Υλοποίηση InsertionSort σε Java

	[0]	[1]	[2]	[3]
x	<del>9</del>	<del>2</del>	<del>7</del>	<del>1</del>
	<del>2</del>	<del>9</del>	<del>9</del>	9
	1	<del>7</del>	7	
		2		

i	j	el	n
<del>1</del>	<del>0</del>	<del>2</del>	4
<del>2</del>	<del>-1</del>	<del>7</del>	
<del>3</del>	<del>1</del>	1	
4	<del>0</del>		
	<del>2</del>		
	<del>1</del>		
	<del>0</del>		
	-1		

```

for (i = 1; i < n; i++)
{
    el = x[i]
    for (j = i-1; (j >= 0) && (x[j] > el); j--)
        x[j+1] = x[j];
    x[j+1] = el;
}
    
```

System.out.println("The sorted array is:");

```

for (i=0; i < n; i++)
    System.out.printf("%d\t", x[i]);
    
```

}

# Ταξινόμηση με Παρεμβολή (Ανάποδα)

9	2	1	7
---	---	---	---

## 1η Εισαγωγή

9	2		7
---	---	--	---

el  
1

9	2	1	7
---	---	---	---

## 2η Εισαγωγή

9		1	7
---	--	---	---

el  
2

9	1		7
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9	1	2	7
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## 3η Εισαγωγή

	1	2	7
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el  
9

1		2	7
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1	2		7
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1	2	7	
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1	2	7	9
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