

# Προγραμματισμός Η/Υ

**Παύλος Πέππας**

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

# Υπολογισμός Μεγίστου Στοιχείου Σειράς

```
public static void main (String[ ] args)
{
    int x[ ] = { 5, 7, 4, 12, 3, 9 };
    int i, max, n;

    max = x[0];
    n = x.length;

    for (i=0; i < n; i++)
        if (x[i] > max)
            max = x[i];

    System.out.println("Max = " + max);
}
```

[0]	[1]	[2]	[3]	[4]	[5]	
5	7	4	12	3	9	x

i	max	n
	5	6

# Υπολογισμός Μεγίστου Στοιχείου Σειράς

```
public static void main (String[ ] args)
{
    int x[ ] = { 5, 7, 4, 12, 3, 9 };
    int i, max, n;

    max = x[0];
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    for (i=0; i < n; i++)
        if (x[i] > max)
            max = x[i];

    System.out.println("Max = " + max);
}
```

[0]	[1]	[2]	[3]	[4]	[5]	
5	7	4	12	3	9	x

i	max	n
0	5	6

# Υπολογισμός Μεγίστου Στοιχείου Σειράς

```
public static void main (String[ ] args)
{
    int x[ ] = { 5, 7, 4, 12, 3, 9 };
    int i, max, n;

    max = x[0];
    n = x.length;

    for (i=0; i < n; i++)
        if (x[i] > max)
            max = x[i];

    System.out.println("Max = " + max);
}
```

[0]	[1]	[2]	[3]	[4]	[5]	
5	<b>7</b>	4	12	3	9	x

i	max	n
<del>0</del>	<del>5</del>	6
1	7	

# Υπολογισμός Μεγίστου Στοιχείου Σειράς

```
public static void main (String[ ] args)
{
    int x[ ] = { 5, 7, 4, 12, 3, 9 };
    int i, max, n;

    max = x[0];
    n = x.length;

    for (i=0; i < n; i++)
        if (x[i] > max)
            max = x[i];

    System.out.println("Max = " + max);
}
```

[0]	[1]	[2]	[3]	[4]	[5]	
5	7	<b>4</b>	12	3	9	x

i	max	n
<del>0</del>	<del>5</del>	6
<del>1</del>	7	
2		

# Υπολογισμός Μεγίστου Στοιχείου Σειράς

```
public static void main (String[ ] args)
{
    int x[ ] = { 5, 7, 4, 12, 3, 9 };
    int i, max, n;

    max = x[0];
    n = x.length;

    for (i=0; i < n; i++)
        if (x[i] > max)
            max = x[i];

    System.out.println("Max = " + max);
}
```

[0]	[1]	[2]	[3]	[4]	[5]	
5	7	4	<b>12</b>	3	9	x

i	max	n
<del>0</del>	<del>5</del>	6
<del>1</del>	<del>7</del>	
<del>2</del>	12	
3		

# Υπολογισμός Μεγίστου Στοιχείου Σειράς

```
public static void main (String[ ] args)
{
    int x[ ] = { 5, 7, 4, 12, 3, 9 };
    int i, max, n;

    max = x[0];
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            max = x[i];

    System.out.println("Max = " + max);
}
```

[0]	[1]	[2]	[3]	[4]	[5]	
5	7	4	12	<b>3</b>	9	x

i	max	n
<del>0</del>	<del>5</del>	6
<del>1</del>	<del>7</del>	
<del>2</del>	12	
<del>3</del>		
4		

# Υπολογισμός Μεγίστου Στοιχείου Σειράς

```
public static void main (String[ ] args)
{
    int x[ ] = { 5, 7, 4, 12, 3, 9 };
    int i, max, n;

    max = x[0];
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```

[0]	[1]	[2]	[3]	[4]	[5]	
5	7	4	12	3	<b>9</b>	x

i	max	n
<del>0</del>	<del>5</del>	6
<del>1</del>	<del>7</del>	
<del>2</del>	12	
<del>3</del>		
<del>4</del>		
5		



# Υπολογισμός Μεγίστου Στοιχείου Σειράς

```
public static void main (String[ ] args)
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            max = x[i];

    System.out.println("Max = " + max);
}
```

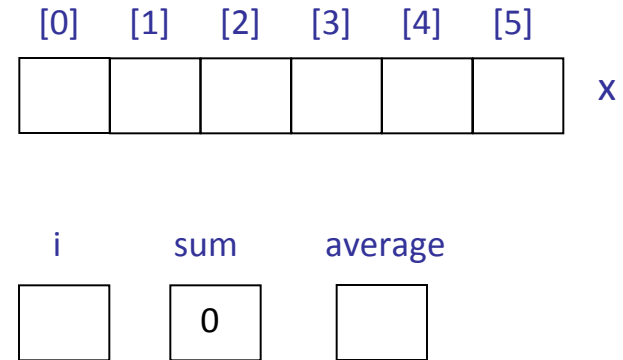
[0]	[1]	[2]	[3]	[4]	[5]	
5	7	4	12	3	9	x

i	max	n
<del>0</del>	<del>5</del>	6
<del>1</del>	<del>7</del>	
<del>2</del>	12	
<del>3</del>		
<del>4</del>		
<del>5</del>		
6		

# Ανάγνωση και Υπολογισμός Μέσου όρου Σειράς

```
public static void main (String[ ] args)
{
    Scanner input = new Scanner( System.in );
    int x[ ];
    int i, sum=0;
    float average;

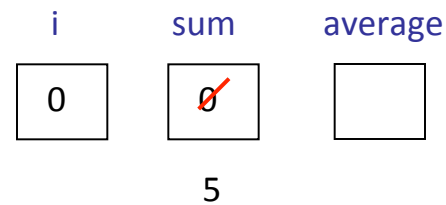
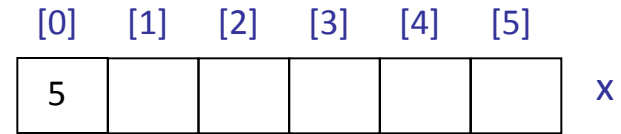
    x = new int[6];
    System.out.print("Enter 6 numbers: ");
    for (i=0; i < 6; i++)
    {
        x[i] = input.nextInt();
        sum = sum+x[i];
    }
    average = sum/6.0;
    System.out.println("Average = " + average);
}
```



# Ανάγνωση και Υπολογισμός Μέσου όρου Σειράς

```
public static void main (String[ ] args)
{
    Scanner input = new Scanner( System.in );
    int x[ ];
    int i, sum=0;
    float average;

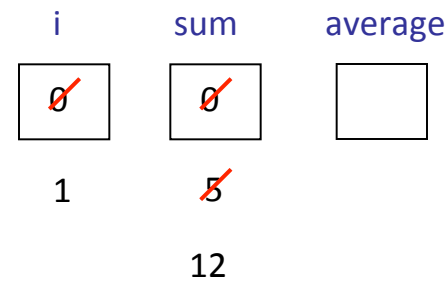
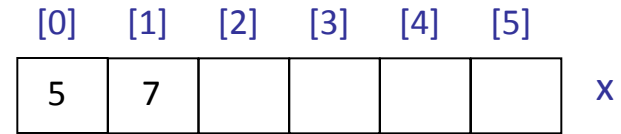
    x = new int[6];
    System.out.print("Enter 6 numbers: ");
    for (i=0; i < 6; i++)
    {
        x[i] = input.nextInt();
        sum = sum+x[i];
    }
    average = sum/6.0;
    System.out.println("Average = " + average);
}
```



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# Ανάγνωση και Υπολογισμός Μέσου όρου Σειράς

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    {
        x[i] = input.nextInt();
        sum = sum+x[i];
    }
    average = sum/6.0;
    System.out.println("Average = " + average);
}
```

[0]	[1]	[2]	[3]	[4]	[5]
5	7	4			

 x

i	sum	average
<del>0</del>	<del>0</del>	
<del>1</del>	<del>5</del>	
2	<del>12</del>	
	16	

# Ανάγνωση και Υπολογισμός Μέσου όρου Σειράς

```
public static void main (String[ ] args)
{
    Scanner input = new Scanner( System.in );
    int x[ ];
    int i, sum=0;
    float average;

    x = new int[6];
    System.out.print("Enter 6 numbers: ");
    for (i=0; i < 6; i++)
    {
        x[i] = input.nextInt();
        sum = sum+x[i];
    }
    average = sum/6.0;
    System.out.println("Average = " + average);
}
```

[0]	[1]	[2]	[3]	[4]	[5]
5	7	4	12		

 x

i	sum	average
<del>0</del>	<del>0</del>	
<del>1</del>	<del>5</del>	
<del>2</del>	<del>12</del>	
3	<del>16</del>	
	28	

# Ανάγνωση και Υπολογισμός Μέσου όρου Σειράς

```
public static void main (String[ ] args)
{
    Scanner input = new Scanner( System.in );
    int x[ ];
    int i, sum=0;
    float average;

    x = new int[6];
    System.out.print("Enter 6 numbers: ");
    for (i=0; i < 6; i++)
    {
        x[i] = input.nextInt();
        sum = sum+x[i];
    }
    average = sum/6.0;
    System.out.println("Average = " + average);
}
```

[0]	[1]	[2]	[3]	[4]	[5]
5	7	4	12	3	

x

i	sum	average
<del>0</del>	<del>0</del>	
<del>1</del>	<del>5</del>	
<del>2</del>	<del>12</del>	
<del>3</del>	<del>16</del>	
4	<del>28</del>	
	31	

# Ανάγνωση και Υπολογισμός Μέσου όρου Σειράς

```
public static void main (String[ ] args)
{
    Scanner input = new Scanner( System.in );
    int x[ ];
    int i, sum=0;
    float average;

    x = new int[6];
    System.out.print("Enter 6 numbers: ");
    for (i=0; i < 6; i++)
    {
        x[i] = input.nextInt();
        sum = sum+x[i];
    }
    average = sum/6.0;
    System.out.println("Average = " + average);
}
```

[0]	[1]	[2]	[3]	[4]	[5]
5	7	4	12	3	11

 x

i	sum	average
<del>0</del>	<del>0</del>	
<del>1</del>	<del>5</del>	
<del>2</del>	<del>12</del>	
<del>3</del>	<del>16</del>	
<del>4</del>	<del>28</del>	
5	31	
	42	



# Ανάγνωση και Υπολογισμός Μέσου όρου Σειράς

```
public static void main (String[ ] args)
{
    Scanner input = new Scanner( System.in );
    int x[ ];
    int i, sum=0;
    float average;

    x = new int[6];
    System.out.print("Enter 6 numbers: ");
    for (i=0; i < 6; i++)
    {
        x[i] = input.nextInt();
        sum = sum+x[i];
    }
    average = sum/6.0;
    System.out.println("Average = " + average);
}
```

[0]	[1]	[2]	[3]	[4]	[5]
5	7	4	12	3	11

 x

i	sum	average
<del>0</del>	<del>0</del>	7.0
<del>1</del>	<del>5</del>	
<del>2</del>	<del>12</del>	
<del>3</del>	<del>16</del>	
<del>4</del>	<del>28</del>	
<del>5</del>	<del>31</del>	
6	42	

# Άσκηση

Γράψτε μια εφαρμογή Java που υπολογίζει αν μια σειρά χαρακτήρων είναι *καρκινική* (δηλ. αν διαβάζεται το ίδιο από αριστερά προς τα δεξιά, και από δεξιά προς τ' αριστερά).

Καρκινική

absba

a\$\$\*\*\$\$a

Μη-Καρκινική

abccca

\$abcCBa\$

# Άσκηση (Συνέχεια)

```
public static void main(String[ ] args)
{
    Scanner input = new Scanner( System.in );
char x[];
    int i, n, left, right, found;
    char a;
    String s;

    System.out.print("Δώσε κείμενο: ");
    s = input.nextLine();
    n = s.length();
    x = new char[n];

    for (i=0; i<n; i++)
        x[i] = s.charAt(i);
```



# Άσκηση (Συνέχεια)

```
public static void main(String[ ] args)
{
    Scanner input = new Scanner( System.in );
    char x[];
    int i, n, left, right, found;
    char a;
    String s;

    System.out.print("Δώσε κείμενο: ");
    s = input.nextLine();
    n = s.length();
    x = new char[n];

    for (i=0; i<n; i++)
        x[i] = s.charAt(i);
```

```
        found = 0;
        left = 0;
        right = n-1;

        while ( left<right)
        {
            if (x[left] != x[right]) found=1;
            left = left+1;
            right = right-1;
        }

        if (found==0)
            System.out.println("Καρκινική γραφή");
        else
            System.out.println("Μη-καρκινική γραφή");
    }
```

# Άσκηση (Συνέχεια)

[0]	[1]	[2]	[3]	[4]	[5]	
'a'	'b'	'\$'	'b'	'S'	'a'	x

left	right	found	n
0	5	0	6

```
found = 0;
left = 0;
right = n-1;

while ( left<right)
{
    if (x[left] != x[right]) found=1;
    left = left+1;
    right = right-1;
}

if (found==0)
    System.out.println("Καρκινική γραφή");
else
    System.out.println("Μη-καρκινική γραφή");
}
```

# Άσκηση (Συνέχεια)

[0]	[1]	[2]	[3]	[4]	[5]	
'a'	'b'	'\$'	'b'	'\$'	'a'	x

left	right	found	n
<del>0</del>	<del>5</del>	<del>0</del>	6
1	4	1	

```
found = 0;
left = 0;
right = n-1;

while ( left<right)
{
    if (x[left] != x[right]) found=1;
    left = left+1;
    right = right-1;
}

if (found==0)
    System.out.println("Καρκινική γραφή");
else
    System.out.println("Μη-καρκινική γραφή");
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```

# Άσκηση (Συνέχεια)

[0]	[1]	[2]	[3]	[4]	[5]	
'a'	'b'	'\$'	'b'	'S'	'a'	x

left	right	found	n
<del>0</del>	<del>5</del>	<del>0</del>	6
<del>1</del>	<del>4</del>	<del>1</del>	
2	3	1	

```
found = 0;  
left = 0;  
right = n-1;
```

```
while ( left<right)
```

```
{  
  if (x[left] != x[right]) found=1;  
  left = left+1;  
  right = right-1;  
}
```

```
if (found==0)
```

```
  System.out.println("Καρκινική γραφή");  
else  
  System.out.println("Μη-καρκινική γραφή");  
}
```

# Άσκηση (Συνέχεια)

[0]	[1]	[2]	[3]	[4]	[5]	
'a'	'b'	'\$'	'b'	'S'	'a'	x

left	right	found	n
<del>0</del>	<del>5</del>	<del>0</del>	6
<del>1</del>	<del>4</del>	<del>1</del>	
<del>2</del>	<del>3</del>	1	
3	2		

Μη-καρκινική γραφή

```
found = 0;  
left = 0;  
right = n-1;
```

```
while ( left<right)  
{  
    if (x[left] != x[right]) found=1;  
    left = left+1;  
    right = right-1;  
}
```

```
if (found==0)  
    System.out.println("Καρκινική γραφή");  
else  
    System.out.println("Μη-καρκινική γραφή");  
}
```



# Άσκηση (Συνέχεια)

[0]	[1]	[2]	[3]	[4]	[5]	
'a'	'b'	'\$'	'b'	'S'	'a'	x

left	right	found	n
<del>0</del>	<del>5</del>	<del>0</del>	6
<del>1</del>	<del>4</del>	1	
2	3		

Μη-καρκινική γραφή

```
found = 0;
left = 0;
right = n-1;
```

```
while ( ( left<right) && (found == 0) )
{
    if (x[left] != x[right]) found=1;
    left = left+1;
    right = right-1;
}
```

```
if (found==0)
    System.out.println("Καρκινική γραφή");
else
    System.out.println("Μη-καρκινική γραφή");
}
```

# Άσκηση (Συνέχεια)

[0]	[1]	[2]	[3]	[4]	[5]	
'\$'	'b'	'a'	'a'	'b'	'\$'	x

left	right	found	n
<del>0</del>	<del>5</del>	0	6
<del>1</del>	<del>4</del>		
<del>2</del>	<del>3</del>		
3	2		

Καρκινική γραφή

```
found = 0;
left = 0;
right = n-1;
```

```
while ( ( left<right) && (found == 0) )
{
    if (x[left] != x[right]) found=1;
    left = left+1;
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}
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```
if (found==0)
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}
```

# Γραμμική Αναζήτηση Πίνακα

ΕΙΣΟΔΟΣ:

target

11
----

x

1	3	7	9	10	13	17
---	---	---	---	----	----	----

# Γραμμική Αναζήτηση Πίνακα

ΕΙΣΟΔΟΣ:

target 

11
----

 x 

1	3	7	9	10	13	17
---	---	---	---	----	----	----

```
public static void main (String[ ] args)
{
    Scanner input = new Scanner( System.in );
    int x[ ];
    int i, pos, target;
    final int n=7;

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

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

    System.out.printf("Enter the target element: ");
    target = input.nextInt();
```



# Γραμμική Αναζήτηση Πίνακα

## ΕΙΣΟΔΟΣ:

target 

11
----

 x 

1	3	7	9	10	13	17
---	---	---	---	----	----	----

```
public static void main (String[ ] args)
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    int x[ ];
    int i, pos, target;
    final int n=7;

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

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

    System.out.printf("Enter the target element: ");
    target = input.nextInt();
```

```
        i = 0;
        pos = -1;

        if (pos == -1)
            System.out.println("Target not found");
        else
            System.out.println("Position = " + pos);
    }
```

# Γραμμική Αναζήτηση Πίνακα

## ΕΙΣΟΔΟΣ:

target 

11
----

 x 

1	3	7	9	10	13	17
---	---	---	---	----	----	----

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    final int n=7;

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

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

    System.out.printf("Enter the target element: ");
    target = input.nextInt();
```

```
        i = 0;
        pos = -1;

        while (i < n) && (pos == -1)
        {
            if (x[i] == target)
                pos = i;

            i++;
        }

        if (pos == -1)
            System.out.println("Target not found");
        else
            System.out.println("Position = " + pos);
    }
```