

Algorithms 4th edition!

1.1 Basic Programming model

Basic structure of a Java Program

A Java program (**class**) is either

- a library of static methods **functions**
- or a data type definition

An Array stores a sequence of values that are all of the same type

Creating and initializing an array involves 3 steps

- 1) Declare the array name and type
- 2) Create the array
- 3) Initialize the array values

e.g

long form

double[] a;

declaration

a = new double[N];

creation

for (int i = 0; i < N; i++)

a[i] = 0.0;

initialization

short form

double[] a = new double[N];

int[] a = {1, 1, 2, 5, 7, 9}

2D arrays? double[][] a = new double[M][N];

M X N array

e.g. `int[][] a = new int[M][N]` rows X column N

	N[0]	N[1]	N[2]
M[0]	1	5	10
M[1]	6	99	4
M[2]	5	6	90

then `a[2][1] == 6` (True that)

find the maximum of array values

```
int max = a[0]    (length = N)
for (int i = 0; i < N; i++)
    if (a[i] > max; max = a[i])
```

0	1	2	
1	2	9	length = 3

average

```
int sum = 0, int avg = 0    N = length
for (int i = 0; i < N; i++)
    sum += a[i]
average = sum / N
```

copy

```
for
    a[i] = b[i]
```

reverse the elements within an array

```
int a = { 4, 1, 2, 3, 1 } N
// need b = { 1, 3, 2, 1, 4 }
```

arr = 5,
N = 5 5 5

```
for (int i = 0; i < N; i++)  
    b[i] = a[N-i-1]
```

i = 0 1
5 4

Every Java Program is either a data type definition or a **library of static methods**

DAY 8 complete! -

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