administrivia
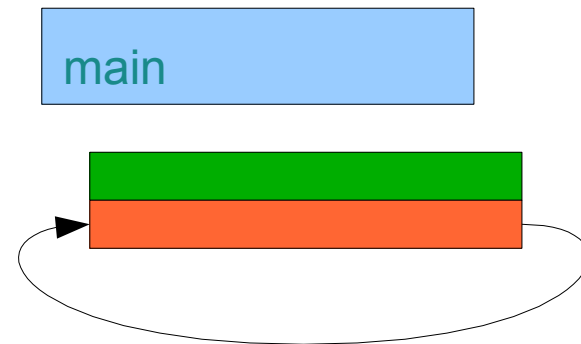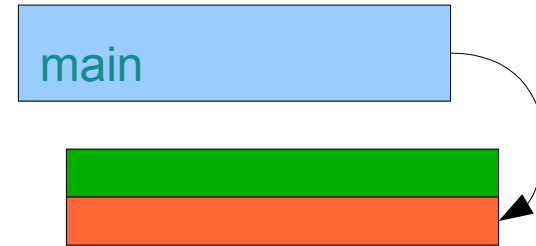
- assignment 2 is graded

- assignment 3 is due 11/1

- midterm is scheduled for 10/27

- omet survey is scheduled for 11/22

… functions …

```
boolean compareNumbers(int x, int y)
{
    if(x<y)
            return true;
    else
            return false;
}
```

invoking functions/methods

- we can call functions from main()

- we can call functions from other function

- we can call function from itself
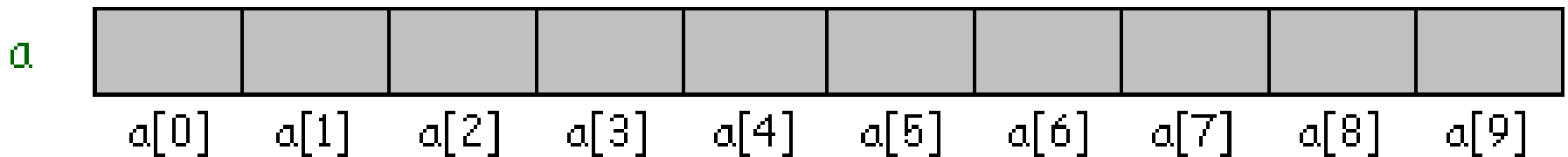
recursive functions example

Fibonacci function

- fib(0) = 0
- fib(1) = 1
- fib(n) = fib(n-1) + fib(n-2)
    - for all n>1

Fibonacci function

```java
public class Fibonacci {

    public static void main(String[] args) {
        int N = 10;
        for (int i = 1; i <= N; i++)
            System.out.println(i +":"+ fib(i));
    }

    public static long fib(int n) {
        if (n <= 1) return n;
        else return fib(n-1) + fib(n-2);

    }
}
```

Arrays

- big quantities of data

- instead of `double a0, a1, a2, a3, a4, a5, a6, a7, a8, a9;` we can have `double[] a = new double[10];`

- ordered sequence

- homogeneous values (same type)

a

| a[0] | a[1] | a[2] | a[3] | a[4] | a[5] | a[6] | a[7] | a[8] | a[9] |

```java
class Basic_Array {

    public static void main (String[] args) {

        int LIMIT = 15;
        int INCREMENT = 10;

        int[] list = new int[LIMIT];

        for (int index = 0; index < LIMIT; index++)
            list[index] = index * INCREMENT;

        list[5] = 999;

        for (int index = 0; index < LIMIT; index++)
            System.out.print (list[index] + "  ");

        System.out.println ();

    }
}
```

```
0   10   20   30   40   999   60   70
80   90   100   110   120   130   140
```

Array of Strings

```java
class Children {

 public static void main (String[] args) {

  String[] name_list = {"Joshua", "Bethany", "Megan", "Eric"};

     for (int name = 0; name < name_list.length; name++)
        System.out.println (name_list[name]);

   }
}
```

Can I use == with arrays?

Answer: *Yes, but ...*

```
int[] a = { 1, 2, 3 };
int[] b = { 1, 2, 3 };
```

```
System.out.println(a == b);
```

Function on arrays

```java
public static double mean(double[] a) {
    double sum = 0.0;
    for (int i = 0; i<a.length; i++)
        sum = sum + a[i];
    return sum / a.length;
}

public static void main(String[] args){
    ...
    double average = mean(a);
    ...
}
```

public static void main(String[] args)?

we are now in position to decipher it:

```java
public static void main(String[] args) {

    for (int i = 0; i < args.length; i++)
        System.out.println(args[i]);
}
```

run it on: 10 20 30 Hello 0.50000 "Hi"

Qs!

- If I have one function that calls another function, does it matter in which order theyappear in my .java file?

- Can I return more than one value from a function?

- What happens if I write code after a return statement?