CSE 20
Intro to Computing I

Lecture 11 – Arrays (4)

Announcements

- Lab #12 this week
  - Due before your next lab
  - Make sure to show your work to **YOUR TA** (or me) before submission
- Project #2
  - Due 12/1 (Friday)
- Final Exam (12/11, Monday, 3pm)
  - Cover everything
  - Open notes
  - Review next lecture
- Extra Credit from zyBooks
  - Course evaluation online by 12/8

Code : Scope

```
int sum = 0, i = 100;
int max = 10;

for(i = 0;i < max;i++) {
   System.out.print("Please enter " + i + "num:");
   int num = input.nextInt();
   sum += num;

   if (i % 3 == 0)
      System.out.println(num + " " + sum);
}

int num = 100;
System.out.println(num + " " + i);
System.out.println(sum);
```

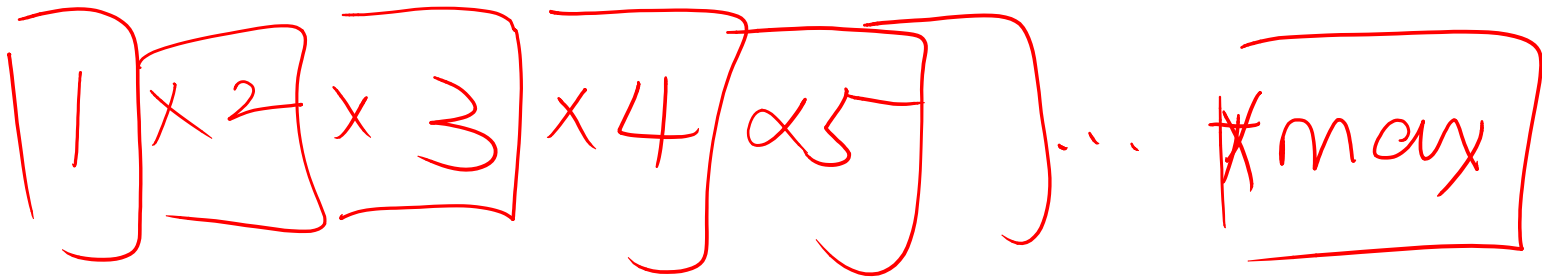
Sample Output

```
int sum = 0, i = 100;
int max = 10;

for(i = 0;i < max;i++) {
  System.out.print("Please enter " + i +
"num:");
  int num = input.nextInt();
  sum += num;

  if (i % 3 == 0)
    System.out.println(num + " " + sum);
}

int num = 100;
System.out.println(num + " " + i);
System.out.println(sum);
```

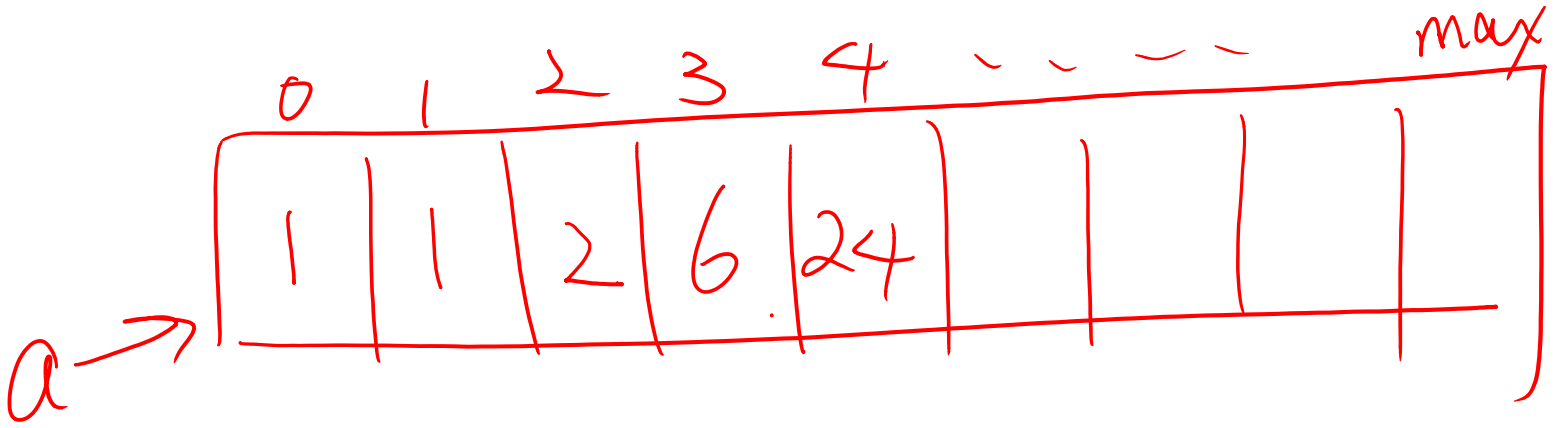
```
Please enter 0 number: 10
10 10
Please enter 1 number: 9
Please enter 2 number: 3
Please enter 3 number: 4
4 26
Please enter 4 number: 2
Please enter 5 number: 5
Please enter 6 number: 6
6 39
Please enter 7 number: 7
Please enter 8 number: 4
Please enter 9 number: 2
2 52
100 10
52
```

Factorial: definition

$$n! = \begin{cases} 1, & n = 0 \\ n \times (n-1) \times (n-2) \ldots \times 2 \times 1, & n > 0 \end{cases}$$



Factorial



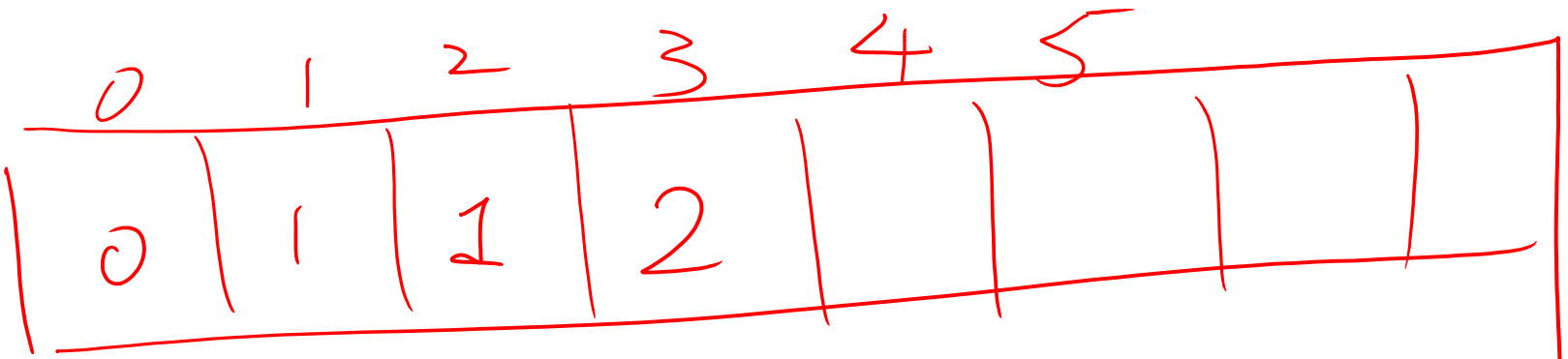
a[0] = 1 1 ,

Fibonacci numbers

$F_0 = 0$
$F_1 = 1$
$F_k = F_{k-1} + F_{k-2}$

0, 1, 1, 2, 3, 5, 8, 13, ...

Fibonacci numbers



$f[0] = 0,\ f[1] = 1$

$i = 2$ $f[2] = f[1] + f[0] = 1 + 0 = 1$

$i = 3$ $f[3] = f[2] + f[1] = 1 + 1 = 2$

$i = n$ $f[n] = f[n-1] + f[n-2]$

Nested Structure: ChooseFunc.java

```
for (int i = 1; i <= max;i++ ) {
  if (func == 1) {
    resArr[i] = resArr[i-1] + i;
  } else if (func == 2) {
    // Fill-in (Sum Square)
  } else if (func == 3) {
    // Fill-in (Factorial)
  } else if (func == 4) {
    // Fill-in (Fibonacci)
  } else {
      System.out.println("Error: Do not know " + func);
    // Fill-in (Stop the for-loop from iterating)
  }
}
```

SumAll

SumSquare

Factorial

Fibonacci

ChooseFunc.java: Scope

```
for (int i = 1; i <= max;i++ ) {
  if (func == 1) {
    resArr[i] = resArr[i-1] + i;
  } else if (func == 2) {
    // Fill-in (Sum Square)
  } else if (func == 3) {
      if (i == 1)
         // Fill-in (Factorial)
      else
         // Fill-in (Factorial)
  } else if (func == 4) {
      if (i == 1)
         // Fill-in (Fibonacci)
      else
         // Fill-in (Fibonacci)
  } else {
      System.out.println("Error: Do not know " + func);
      // Fill-in (Stop the for-loop from iterating)
  }
}
```