

CSE 8A Lecture 22

- We made it – yayyy!!!
- SMarx extra final exam office hours Fri 3/15 11:15am-1pm EBU-3B #2206
- Reminder must earn 55% or above on final exam to pass CSE 8a
- Verify grades on gradesource.com
 - **Reading Quiz for Week 8 is being fixed**

JAVA ARRAYS

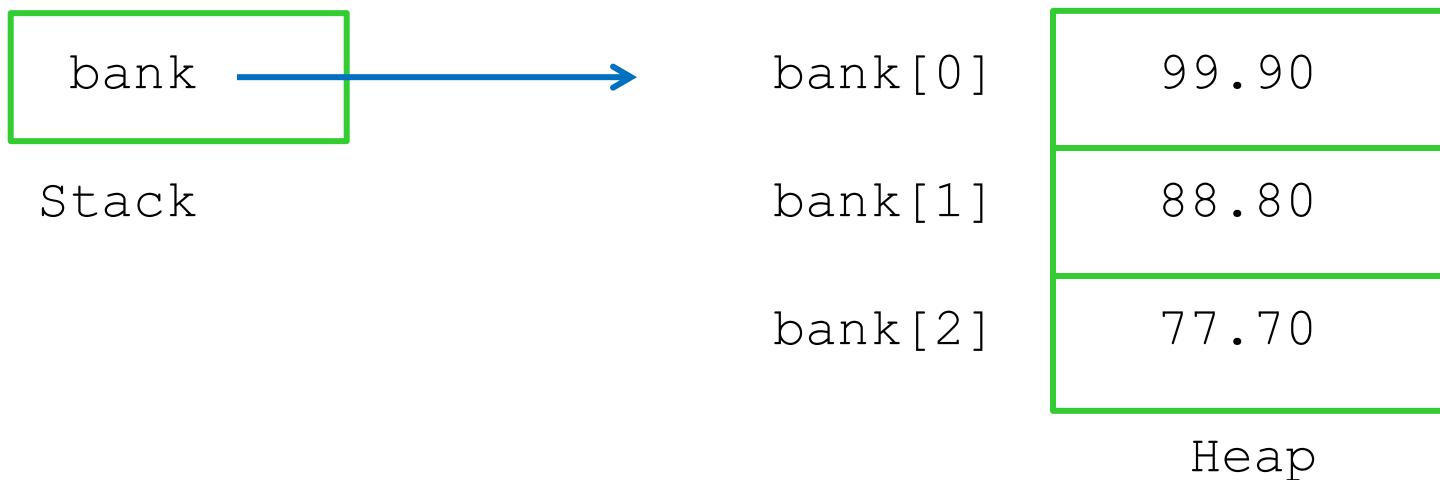
An array is a collection of data whose elements form an ordered sequence. The elements are all the same data type (char, int, double, ...)

```
int motel[] = {1, 3, 4, 0, 3, 2};
```

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

INITIALIZATION

```
int age[] = {10, 20, 30, 40}; // Array of 4 integers  
  
char [] name = {'S', 'a', 'm'}; // Array of 3 chars  
  
double []bank ={99.9, 88.8, 77.7}; // Alloc, init, assign
```



```

public class Grades1
{
    public static void main( String [] args )
    {
        int i, grades[];                                // Declaration, no memory allocated
        grades = new int[ 4 ];                          // Allocate memory dynamically

        for( i = 0 ; i < grades.length ; ++i )          // Fill with values
            grades[i] = i + 2;

        for( i = 0 ; i < grades.length ; ++i )          // length member
            System.out.println( "grades[" + i + "] " + grades[i]);
    }
}

```

"**int [] grades;**" is a declaration for the array name, grades

grades[0] 2

grades[1] 3

grades[2] 4

grades[3] 5

"**grades = new int [4];**" causes the dynamic allocation of memory
for 4 whole numbers

The "[]" brackets is really an operator. The enclosed value is an "offset" of the number of elements from the beginning address.

- Invalid array element reference generates an `ArrayIndexOutOfBoundsException`

Suppose the Registrar's office asked CSE 8a to write an application to manipulate student records.

Discuss what attributes a “class Student” has:

Let's list some of them:

name

id

address

gpa

grades

What data type are these?

```
??? id;  
??? gpa;  
??? name;  
??? pid; // "A" + id++ (A101)  
??? grades;
```

- | | | | |
|------------------|---------------|------------------|----------|
| A) double
int | B) int
int | C) int
double | D) other |
| String | String | String | String |
| String | String | String | String |
| String | int [] | int [] | |

Let us create a class with instance variables.
What actions operate on the data (methods)?

```
class Student
{
    int         id;
    double     gpa;
    double []  grades;
    String     pid;      // "A" + id++
    ???
}
```

Fill in the blanks with correct data type to compile:

```
class Student
{
    private int      id;          // private data
    private double   gpa;
    private double[] grades;
    private String   pid;         // "A" + id++ (A101)

    public _____ Student (int i, double []g, double gp, String pd){ /* */ }
    public _____ print( ){ /* some code */ }
    public _____ avgGrade(){ return 0.0; /*stub */ }
}
```

- | | | | |
|---------|----------|---------|----------|
| A) void | B) blank | C) void | D) blank |
| void | void | int | String |
| void | double | double | int |

How do we test our class?

```
class Student
{
    private int      id;                                // instance variables
    private int      [] grades;
    private double   gpa;
    private String   pid;                               // "A" + id++ (A101)

    public Student (int i, int []g, double gp){ /* */ }
    public void      print ( ){ /* some code */ }        // instance methods
    public double    avgGrade(){ return 0; /*stub */ }

    public static void main(String [] args)             // Driver
    {
        int []      myExam = {10, 14, 16, 20};
        Student s1 = new Student( 101, myExam, 3.2 );
        System.out.println( s1.avgGrade() );
        s1.print();
    }
}
```

How many lines do you need to edit to remove errors?

```
class Student
{
    private int      id;
    private int      [] grades;
    private double   gpa;
    private String   pid;

    public void     Student (int i, int []g, double gp){ /* */ }
    private void    print ( ){ /* some code */ }
    public double   avgGrade(){ return 0; /*stub */ }

    public static void main(String [] args)
    {
        int []      myExam = {10, 14, 16, 20};
        Student s1 = new Student( 101, myExam, 3.2 );
        System.out.println( s1.avgGrade() );
        s1.print();
    }
}
```

- A) 1
- B) 2
- C) 3
- D) other

TODO

- Study!
- Final Exam
 - A00 Fri 3/15 8-10am Pepper Cyn 106
 - B00 Wed 3/13 11:30am-1:30pm TBA