THE UNIVERSITY OF MELBOURNE

Lab5（week7）

COMP90041 Programming and software development

Zhe(Zoe) Wang

Array

give value to array

Form: *baseType*[] *varName* = {*value*, ...};

```
public static final int[] DAYS_IN_MONTH
    = {31,28,31,30,31,30,31,31,30,31,30,31};
```

Form: new *type*[*size*]

create an empty array

```
double[] data = new double[10];
```

type, size

```
int[] bob = {1,2,3}
```

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

```
int[] sue;
sue = new int[3];
sue[0] = 1;
sue[1] = 2;
sue[2] = 3;
```

```
int[] sue;
sue = new int[]{1,2,3};
```

iterating arrays

```
for (int i = 0 ; i < a.length ; ++i) ... a[i] ...
```

The Foreach Loop

```
for(elementType name : array) body
```

print array, assign values, copy…

demo0

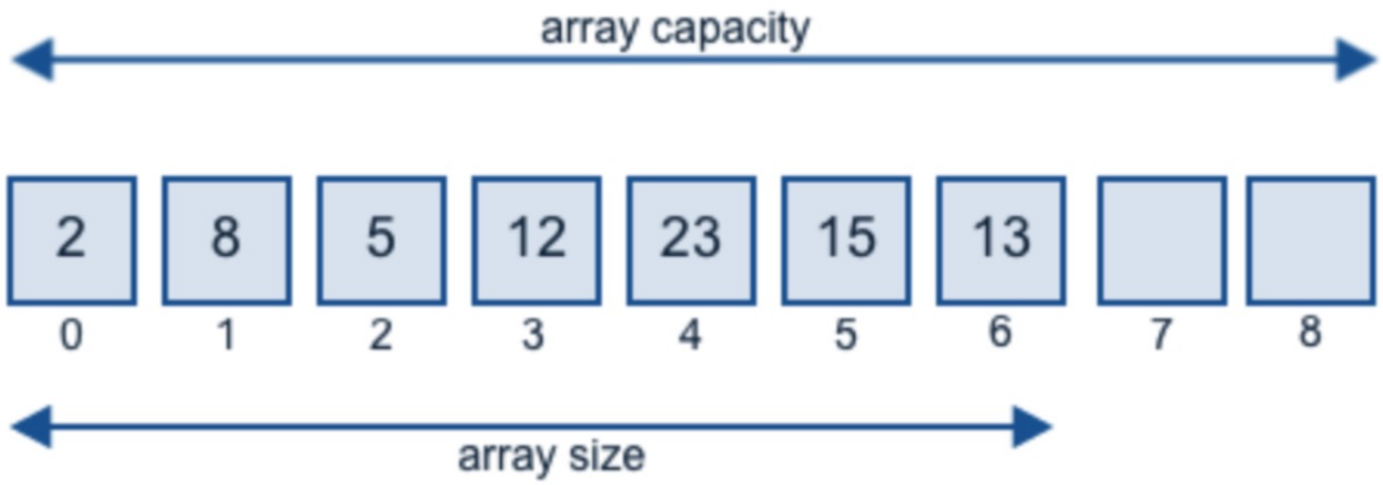
Change an array element

```
String[] pl = {"java", "python", "go", "javascript"};
```

```
pl[2] = "c++";
```

Array length vs Array size

```
int[] score = new int[9];
```




```
System.out.println(score.length());
```

What does this print?

```
int[] a = {1,1,2}
int sum=0;
for (int i=1; i<=a.length; ++i) sum += a[i];
System.out.println(sum);
```

A. 1
B. 2
C. 3
D. 4
E. There's a runtime error

Try to access element outside the length?

java.lang.ArrayIndexOutOfBoundsException:

Array of objects

demo1

- Can declare array with a class as base type
- *E.g.*, `String[] args`

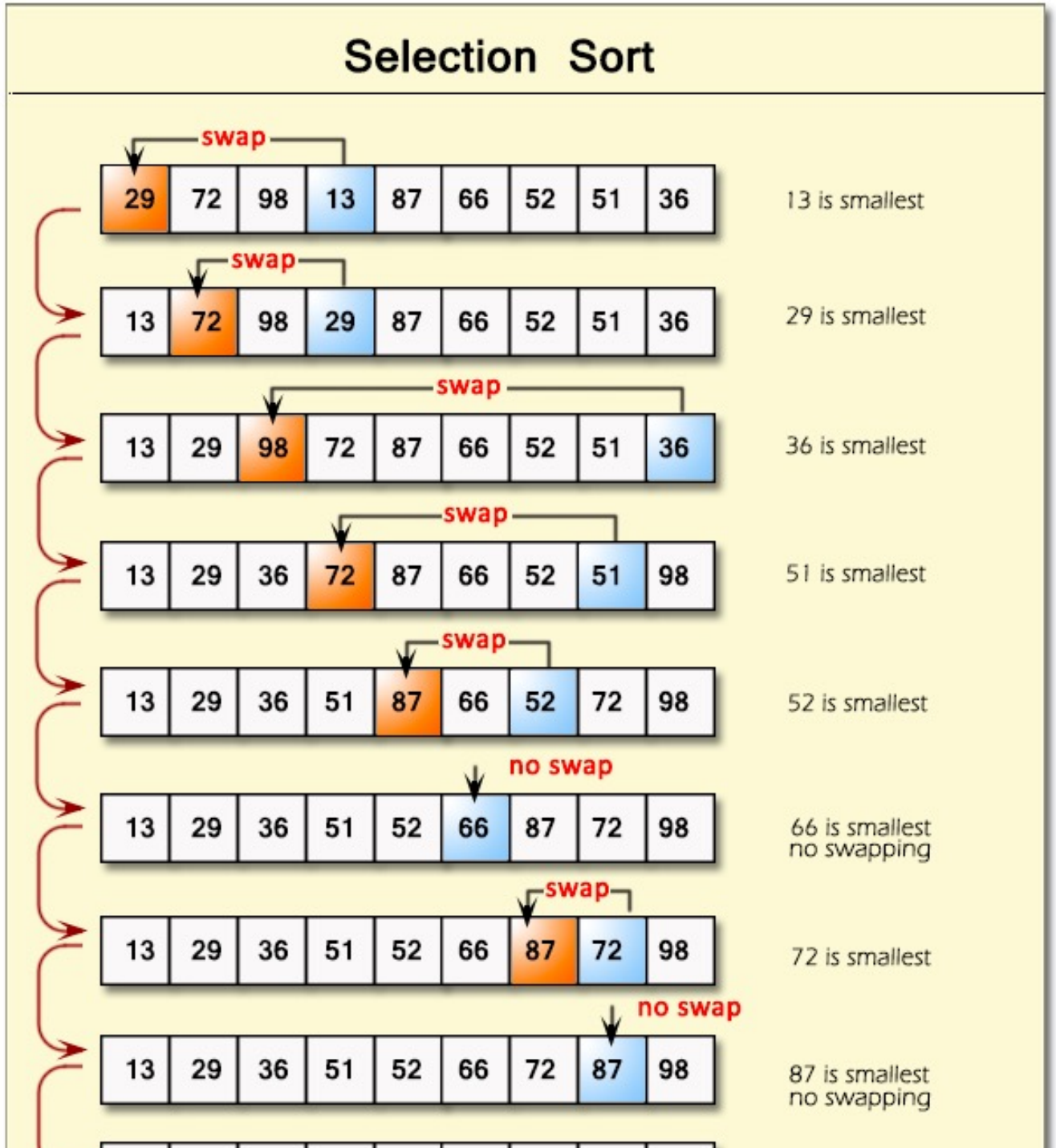
demo: create an array of Dog

demo: add a new Dog

demo: remove a Dog

demo: edit a Dog

```
private static int ARRAY_LENGTH = 10;
int [] numbers = new int [ARRAY_LENGTH];

// Read in the array from keyboard
readArray(numbers);

// Display an array
display(numbers);

// Get maximum value of an array
int max = getMax(numbers);
System.out.println("Max value is: " + max);

// Get the sum of all elements in an array
int sum = getSum(numbers);
System.out.println("Sum is: " + sum);

// Sort array elements in descending order
sortArrayDescendingly(numbers);

// Find the element with the largest number of appearances
// If there is a tie then return the smaller element
int mostFrequent = getMostFrequent(numbers);
System.out.println("Most frequent value is: " + mostFrequent);
```



use temp to store the i th max value

swap

find most frequency

String operations

s.substring()

- `s.substring(i, j)` returns the substring of `s` from character `i` through `j`-1, counting the first char as 0
- E.g., `"smiles".substring(1,5)`, returns `"mile"`

s.indexOf()

- `s.indexOf(s2)` returns the first position of `s2` in `s`

s.equals()

- `s.equals(s2)` returns true if a `s` and `s2` are identical

== VS equals

= = can correctly test two values of a primitive type

However, when applied to two objects such as objects of the String class, == tests to see if they are stored in the same memory location, not whether or not they have the same value

Do not use = = with Strings!!

```
public class Demo5 {
    public static void main(String[] args) {
        String s1 = new String( original: "abc");
        String s2 = new String( original: "abc");
        System.out.println(s1 ==s2);

    }
```

== VS equals

```
public class Demo5 {
    public static void main(String[] args) {
        String s1 = new String( original: "abc");
        String s2 = new String( original: "abc");
        System.out.println(s1 ==s2);

    }
```

```
String s1 = "abc";
String s2 = "abc";
System.out.println(s1 == s2);
```

demo5

copy an array

```
int[] arr = {1,2,3};
int[] cloneArr = arr.clone();
```

```
System.out.println(cloneArr == arr);
System.out.println(Arrays.equals(cloneArr, arr));
```

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Thank you