Advanced Java Programming

Ohad Barzilay,
Tel-Aviv University
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Java Syntax & Structures

(full version in the course web site)

Identifiers, Keywords, Literals
Separators and Operators

Control Structures and statements

Flow Control Staetments

- `if , if – else`
- `while , do – while`
- `for`
- `switch`
- `break , continue`
- Labeled `break` , Labeled `continue`

Labeled `continue` and `break`

- In nested loops we might want to `break`/`continue` with respect to the outer loop
- As there is no `goto` in java – labels serves the missing feature

Labeled `break`

```
outer:
do {
   statement1;
   do {
            statement2;
            if ( condition ) {
                  break outer;
            }
            statement3;
   } while ( test_expr );

   statement4;

} while ( test_expr );
```

Labeled `continue`

```
test:
   do {
      statement1;
      do {
            statement2;
            if ( condition ) {
                  continue test;
            }
            statement3;
      } while ( test_expr );

      statement4;

   } while ( test_expr );
```


Packages and Import statements

Java API (Packages)

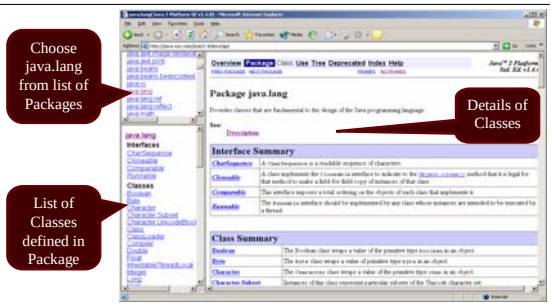
- Java comes with 3,000+ pre-designed components.
- The Java API is the library of classes supplied by Java.
- The classes in the Java API is separated into packages. Each package contains a set of classes that are related in some way.

The Java API Packages

```
java.applet     java.net
java.awt        java.rmi
java.beans      java.security
java.io         java.sql
java.lang       java.text
java.math       java.util
...
```


Documentation: http://java.sun.com/j2se/1.5.0/docs/api/

java.lang



`String` Class

`String` Methods

Importing Packages

- Using a class from the Java API can be accomplished by using its fully qualified name:

```
java.util.Random random =
      new java.util.Random();
```

- Or the class can be imported once with the import statement at the top of the file:

```
import java.util.Random;
. . . Random random = new Random();
```


Importing Packages

- You can also import all the classes in a given package with a single import statement:

```
import java.util.*;
```

- The `java.lang` package is automatically imported into every Java program.

Arrays

Arrays

- An array is an object that can be used to store a list of values.
- All array elements are of the same type (primitive or objects).
- Arrays have fixed sizes, set when the array is created.

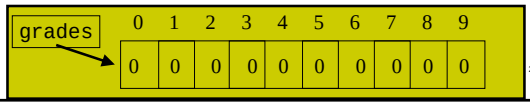
Array Elements

- A particular value in an array is referenced using the array name followed by the index in brackets.
- As in C, a java Array of size n is indexed from 0 to n-1.
- The Java interpreter will throw an exception if an array index is out of bounds.

Creating Arrays

- Array elements are initialized with there default values

```
int[] grades = new int[10];
grades[3] = 70;
grades[7] = 87;
int i = 5;
grades [i/2] = 39;
```



Initialization list

- You can declare, construct, and initialize the array all in one statement:

```
int[] primes = {2,3,5,7,11,13,17,19};
```

- This declares an array of type `int`, constructs an array of 8 slots, and assigns the designated values into the array.

```
int[] [] values = {{1,2,5}, {4,3,2,1}, {11}};
```