CS1007 lecture #3 notes,

thu 13 sep 2001

http://www.cs.columbia.edu/~sklar/cs1007

today:

- news
- computer basics (review)
- Java introduction
- creating/editing your first Java program
- compiling and running your first Java program
- applets and applications
- reading: *ch 1.1-1.5*

news.

- *textbook:*
  additional copies available this week at Labyrinth
- *AcIS training:*
  additional session on Thursday 13 Sep, 1-3pm, 306 Butler

computer basics: review.

- computer = hardware + software
- software = computer program = set of instructions
- types of instructions:
  – machine language
  – assembly language
  – high-level language (e.g., C, C++, Java)
- program is *compiled* into machine language and then *executed (ran)*

Java, 1: introduction.

- Java is an *object-oriented* language:
  programs are structured around *objects* and *methods*, where a method is an action or something you do with the object
- Java programs are divided into entities called *classes*
- some Java classes are *native*
  but you can also write classes yourself
- Java programs can run as *applications* or *applets*

Java, 2: client-server model.

- the *Internet* is an autocratic system based on the *client – server* model
  – *server* tells client what to do
  – *client* does it
- commands may be executed at either the client or the server level
- Java tries to maximize execution at the client level
- Java runs inside a virtual machine (“JVM”)
  (to make it portable)

Java, 3: execution model.

- *application:*
  client and server are the same computer
- *applet:*
  server sends applet to the client, in the form of class files;
  applet invokes JVM which interprets classes and runs them on the client
- applet example: Tron
  http://www.demo.cs.brandeis.edu/tron

Java, 4: your first application.

“hello world”

- typical first program in any language
- output only (on input)

Java, 5: the application source code.

file name = hello.java

```
/*-------------------------------------------------------
   EISklar, 11-Sep-01, hello.java

   This class demonstrates output from a Java application.
-------------------------------------------------------*/
public class hello {
    public static void main ( String[] args ) {
        System.out.println( "hello world!\n" );
    } // end of main()
} // end of class hello()
```


Java, 6: things to notice.

- Java is CASE sensitive
- punctuation is really important!
- *whitespace* doesn’t matter for compilation — except between *words*
- *BUT* whitespace DOES matter for readability and your grade!
- file name is same as class name

Java, 7: try it yourself.

- log into CUNIX
- create the application source code file,
  using the *emacs* (or *ejava*) editor
- compile the source code,
  using the *javac* command
- execute an application using the *java* command
- execute an applet using the *appletviewer* command
  OR a browser, like Netscape

Java, 8: quick and dirty UNIX

- UNIX is an operating system,
  – *Linux* is a version of UNIX
- command-line interface
  – commands have options, also called *switches*
- here are some commands:

```
ls     -- list the files in the current directory
cp     -- copy a file
mv     -- rename a file
rm     -- delete (remove) a file
cd     -- change directory
pwd    -- show the current directory
man    -- help
chmod  -- change file protections
```


Java, 9: quick and dirty *emacs*

- at the UNIX prompt: `unix> ejava hello.java`
- emacs is a “control key” editor
- here are some commands:

```
Ctrl-B         -- move cursor Back
Ctrl-F         -- move cursor Forward
Ctrl-P         -- move cursor to Previous line
Ctrl-N         -- move cursor to Next line
Ctrl-D         -- Delete character under cursor
Ctrl-X Ctrl-S  -- Save the file
Ctrl-X Ctrl-C  -- eXit emacs
Ctrl-H         -- Help
Ctrl-G         -- Gets you out of trouble!
```

Java, 10: the applet source code.

file name = hi.java

```
/*-------------------------------------------------------
   EISklar, 11-Sep-01, hi.java

   This class demonstrates output from a Java applet.
-------------------------------------------------------*/
import java.applet.Applet;
import java.awt.*;

public class hi extends Applet {

    public void paint ( Graphics g ) {
        g.drawString( "hello world!",10,10 );
    } // end of paint()

} // end of class hi()
```


Java, 11: the HTML source

file name = hi.html

```
<html>
<title>
sample applet page
</title>

the applet will be shown below...

<applet code="hi.class" width=400 height=400>
</applet>

</html>
```


homework #1.

- create a Java application that outputs a recipe to the screen
- compile and run it
- submit it electronically

⇒ description available on web page:
http://www.cs.columbia.edu/~sklar/cs1007/hw1.html

⇒ “submit” instructions next time!

to do.

- read chapter 1.1 – 1.5
- attend one of the AcIS training sessions
- try logging into your CUNIX account
- check out the class web page:
  http://www.cs.columbia.edu/~sklar/cs1007
- homework #1 due Tue Sep 25