Java Applets & the RealJ IDE

- Java applets must be
  - Prepared as source text in the Java language
  - Then compiled (translated) into runnable form
  - Then run or viewed by a WWW browser (or appletviewer)
- To do this we will use
  - the RealJ IDE to prepare applets (IDE stands for "integrated development environment")
  - and the Sun Java Development Kit to compile, run and view applets
- The IDE helps to manage the process of
  - preparing the program (applet)
  - translating the applet so it can be run
  - running/viewing the applet

Starting the RealJ IDE

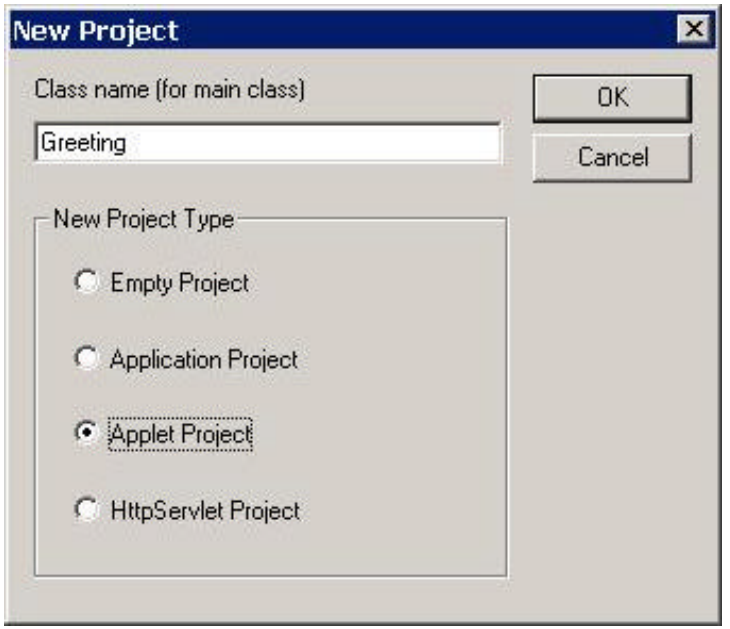
- There are two ways:
  - From the Start menu choose Programs\RealJ\RealJ

    (The icon is )
  - Or double-click on the icon for an existing project file (more later)

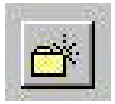
    (The icon is )
- The RealJ window will appear, with a combined menu and toolbar across the top:

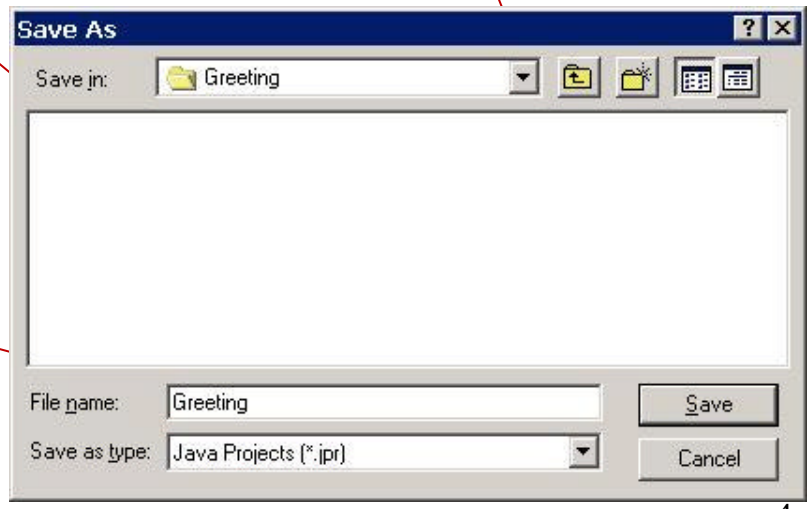
Creating a Simple Project

- On the Project menu, select New Project
- You should get the dialog box below - this is where you can give a name for your applet
- Click on the Applet Project option, type the applet name Greeting into the text box, and then click on OK
- RealJ will then start to create a basic applet that you can try out



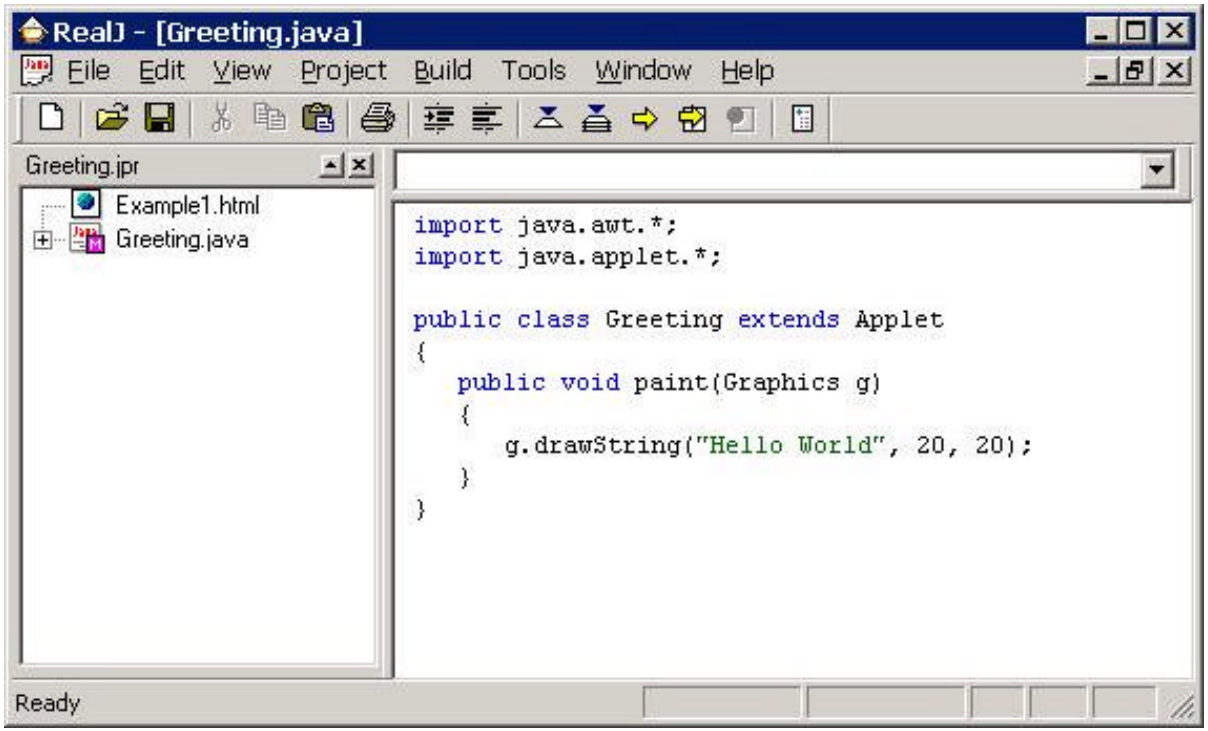
Creating a Project, Continued...

- Next, you will see a dialog box which will ask you to
  - Choose a location for your project files
  - Choose a name for your project file
- Navigate to an appropriate folder location like this:
  - Click on the drop-down folder selector
  - Navigate to an appropriate location on your hard drive, such as the CSCI211 folder or somewhere on your desktop
  - Then click on the  button to create a new folder: call it **`Greeting`**
  - Double-click on Greeting to navigate into it
- Enter a name for the project, **`Greeting`**, and click Save



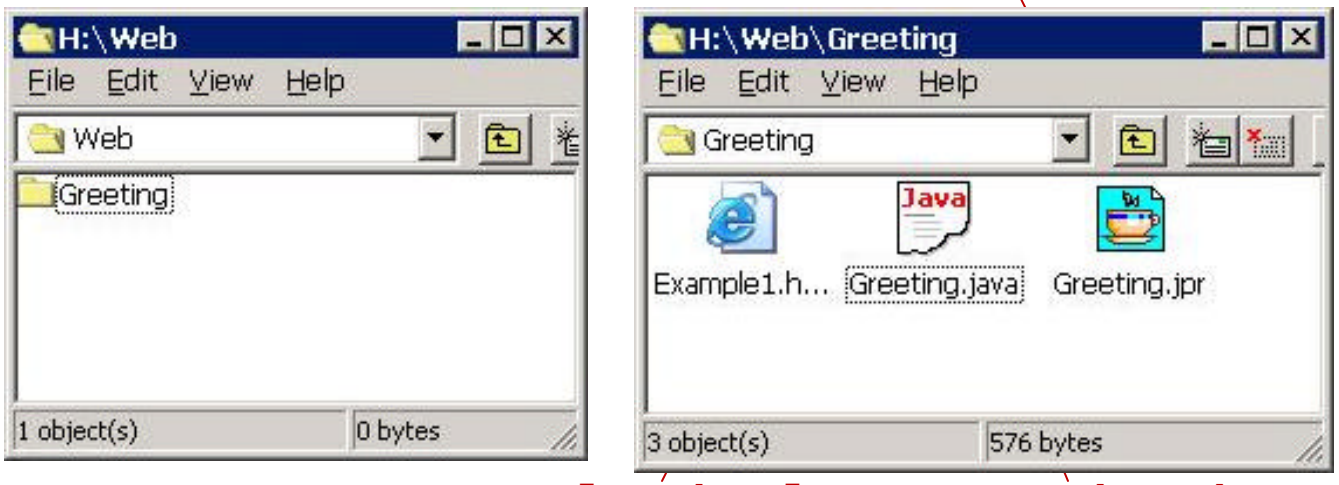
The RealJ Window

- You will see a screen like the one below
- This shows the "project window" on the left, which details the contents of the project
- RealJ has already created and opened the **`Greeting.java`** file, and shows its contents on the right



The Project *folder* Contents

- On the desktop, open your Java folder, or the **`My Documents`** shortcut, and navigate to the new folder **`Greeting`** that you created within it. Open it.
- This folder contains the basic necessary items for a Java applet project:
  - An HTML and a Java file (these are essential to Java),
  - And a project description file: **`Greeting.jpr`** (this is specific to RealJ)



`Example1.html` **`Greeting.java`**

Contents of a Project

- Note that the RealJ project window contains the names of two of the files which have appeared in the new folder:

  `Example1.html`

  `Greeting.java`

- These are there merely as "placeholders"
  - These two files actually reside in the new folder; they are merely referred to in the project window
  - Normally these two files will be modified or replaced, so as to be appropriate for the applet which we want to write
- For now we'll just use the placeholders, see what they contain, and see what they do

Contents of a Project, Continued...

- When we are dealing with applets, our project must always contain
  - A `.html` file
  - A `.java` file
- The former contains an HTML document which we can use to actually run the Java applet
- The latter contains the source text of the Java applet
- We can see the contents of these files (and make changes to them if we wish) by double-clicking on their icons in the RealJ project window
  - This opens the file in a new window using RealJ's own program editor
- Note: Double-clicking on the `.html` file in the desktop folder will instead launch a browser to display the HTML

HTML

- Here are the contents of the file **`Example1.html`**:

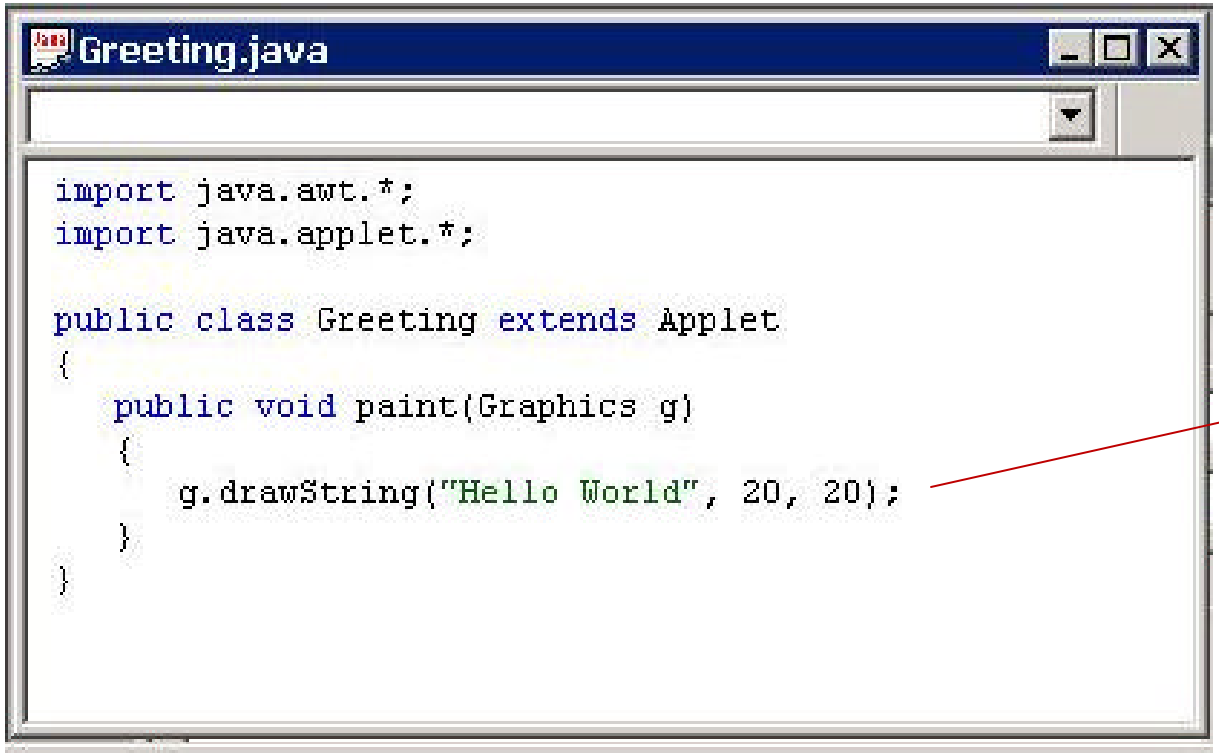
Example1.html

```
<HTML>
   <HEAD>
      <TITLE>MyApplet Example1</TITLE>
   </HEAD>
   <BODY>
      <H1>MyApplet</H1>
      <HR>
      <P>
         <APPLET CODE="Greeting.class" WIDTH="300" HEIGHT="300">
         </APPLET>
      </P>
      <HR>
   </BODY>
</HTML>
```

- Note the straightforward **`APPLET`** tag:
  - Compiled **`.class`** file name
  - Window size

The Applet

And here is the applet which appeared automatically, in the file **`Greeting.java`**:



Running an Applet

- Programs in Java (or any other high-level language) must be translated/compiled (into bytecode) before they can be run
- The RealJ IDE organizes this for us:
  - There is a row of buttons across the top of the window:
  - Two key buttons are "Compile" and "Run Applet")

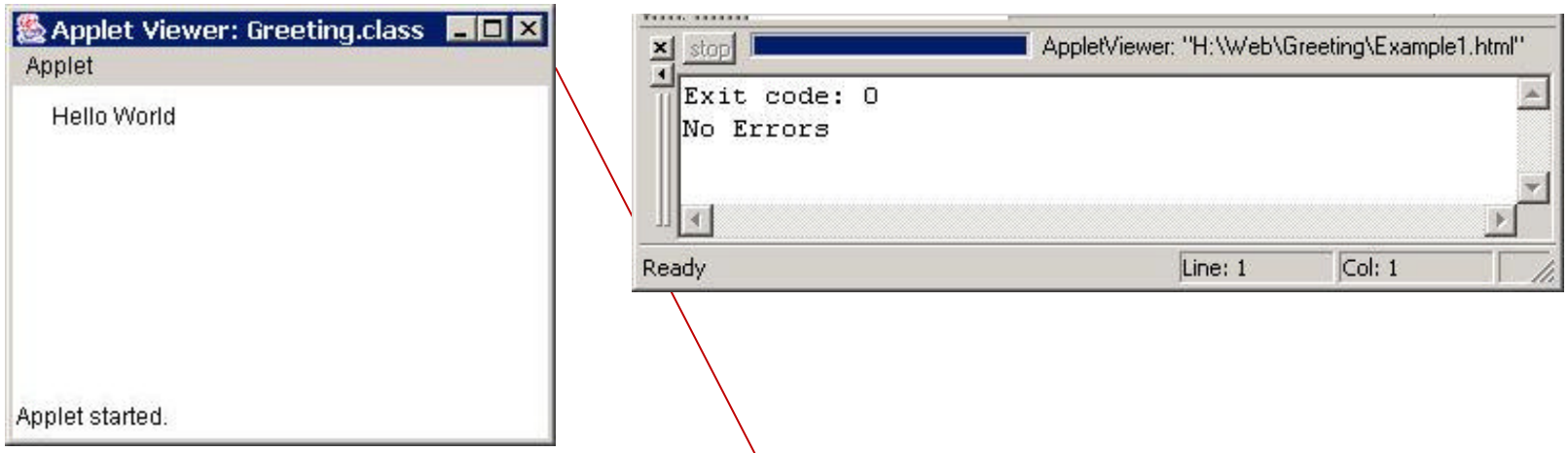
"Compile" and "Run Applet" are also available in the Build menu

Compiling

- To compile the applet, make sure that its window is open in RealJ, and click the Compile button
- RealJ will show a new sub-window, the "process window"
- If the applet contains errors, the translation may not be possible, and the IDE will show an error message (or messages) in the process window
- The messages show us where (the compiler thinks) the error is, allowing us to correct it in the editor window:
  - We may need to scroll the process window up
  - Each message gives a line number
  - We can double click the line number to highlight the text in the RealJ editor window
- After making corrections, you click Compile again
- Note: The IDE automatically asks you whether to save files when you compile

Viewing the Applet

- When there are no more compilation errors, the applet is ready to run
- Click on the "Run Applet" button, the applet runs:
  - The Sun **`appletviewer`** application is launched,
  - and we see an "Applet Viewer" window, which displays the applet (on the left, below)
  - and the process window may show miscellaneous messages



Click the Applet Viewer close box when you are finished viewing

The Results of Compiling

- The RealJ IDE has stored the translated (compiled) applet in a file called **`Greeting.class`** in the folder

- Note: Depending on your PC's settings you might not be able to see the **`.class`**, etc. file name extensions

Run a Viewlet Showing This Entire Process

You can run a Viewlet that shows this entire procedure by following this link:

http://web.cocc.edu/pcasey/viewlets/realj.html