Announcements

Friday is Valentine's Day

Animation

JavaScript can be used for animating images on a web page.

The Plan

An animation is the rapid display of a series of still images ... like cartoons
There are three steps to animate
• Place first still image(s) on web page
• Prefetch the series of images and store them
• Setup a timer to cycle through the images
  new0.gif, new1.gif, new2.gif, new3.gif

Smooth motion requires 30 times/sec display.

Creating GIFs

GIF files for animation are progressively different ... make them w/Photoshop
• The series should all have the same size
• Begin with an initial GIF and build all others from it
• Getting the motion to be smooth may take a bit of fiddling

Prefetched GIFs — GIFs that automatically use a special format and software.

Place Still Image(s)

Placing the image uses a standard <img src=...> tag

<body>
  <img src="new0.gif">
  <script language="JavaScript"> Code goes here</script>
</body>

The document.images

When HTML draws a page, the images go in an array: document.images
• Recall, arrays are names w/ indexes, like A[1]
• Each element of document.images array holds one image
• Pictures are put into document.images in the order the encountered on the page ... so for Test Page, document.images[0] = new0.gif
• Changing the src property of the array changes the picture chosen. All the images must be prefetched first.
Prefetch Images I

"Prefetch" means to get the images and save them in (our own) array so they are handy to assign to doc.
i
- We must declare an array (and probably an index variable, too):
  var i, pref = new Array(4);
- Then we set it up to hold images:
  for (i=0; i<4; i++) {
    pref[i] = new Image;
  }

Prefetch Images II

Once the array is declared and setup, get the images and assign them to the _src_ field of the array:

```javascript
for (i=0; i<4; i++) {
  pref[i].src = "new" + i + " .gif";
}
```

- Notice that the names of the images, new0.gif, new1.gif, new2.gif, new3.gif are "constructed" using the index variable

Test It

```javascript
<IMG src="new0.gif">
<IMG src="new1.gif">
<script language="JavaScript">
  var i, pref = new Array(4);
  for (i=0; i<4; i++) {
    pref[i] = new Image;
  }
  for (i=0; i<4; i++) {
    pref[i].src = "new" + i + " .gif";
  }
  document.images[0].src = pref[1].src;
</script>
```

Place two "O" pix then change the first to "1".

Change Image

Once Web page is drawn, nothing happens unless you cause an event

- To animate a series of stills you must cause the computer to "wake-up" and change to the next image 30 times a second
- Set a timer to cause the wake-up

```javascript
  timerID=setTimeout("animate()", 30);
```

Milliseconds to wait
Function to change picture
JS Timer Setting Function
Handle holder -- to be explained

Animate Function

```javascript
  function animate()
  {frame=frame+1; //advance
document.images[0].src = prefetch[frame].src; //update
timerID=setTimeout("animate()", 30);
  }
```

Watch It Go
Changes ...

Suppose we want “new” to rotate once every 5 seconds ...

- animate() sets timer for two different times
- When animating, 30 ms
- When waiting, 5000
- Use an if-statement

```javascript
if (frame == 0)
    setTimeout("animate()", 5000);
else
    setTimeout("animate()", 30);
```

Watch It Go

```javascript
var i, pref = new Array(4);
var frame = 1, timerID;
for (i=0; i<4; i++)
    pref[i] = new Image;
for (i=0; i<4; i++)
    pref[i].src = "new" + i + ".gif";
timerID = setTimeout("animate()", 5000);
function animate()
    frame = (frame+1)%4;
document.images[0].src = pref[frame].src;
if (frame == 0)
    timerID = setTimeout("animate()", 5000);
else
    timerID = setTimeout("animate()", 30);
```

Chapter 21

Chapter 21 illustrates solving a large problem – an animated page

- The main topic is how to decompose a large problem into pieces and reassemble
- Project 2 is a large project [that was divided for you to be an assignment]
- When you have time -- end of term? -- try your creating your own animations

Summary

Animation requires a 3 step process

- Place the initial image(s)
- Prefetch the series of images that will be the animation
- Setup the animation function to draw the next item in the series

Note: creating your own GIFs make sure that the sizes are all the same