Computing

Lesson 6: Always Another Way

Data Representation

Dharini Krishnamoorthy



Mix up an emoji (in your browser)

Steps	Instructions
Use a browser (such as Firefox or Chrome) to open the vector image emoji.svg . You should see an emoji in your browser window. Note: This is an image file, which your browser has requested from a remote computer and has rendered for you.	The keyboard shortcut Ctrl should open the file selection menu, no matter which browser you are using. Select the name of the file that you will be opening.



Mix up an emoji (in your browser)

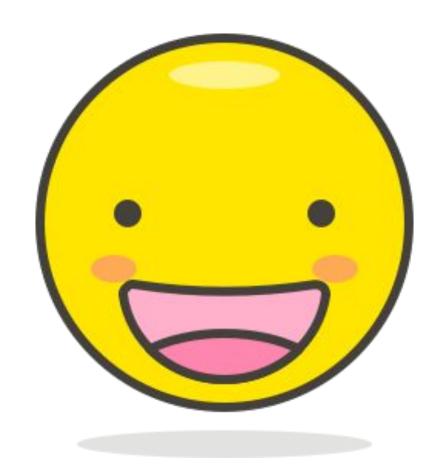
Instructions Steps Activate your browser's **developer** The keyboard shortcut Ctrl Shift I should activate tools. the developer tools, no matter which browser you are They will allow you to inspect the using. individual geometrical shapes Alternative: In **Firefox**: Click on the sandwich menu that make up the emoji and Web developer ⊳ Toggle tools modify their attributes. In **Chrome**: Click on the **More** menu More tools > Developer tools



Task 1: Vector image manipulation

```
<circle cx="24" cy="21.5" r="20">
<ellipse cx="24" cy="5.5" rx="6" ry="1.5"/>
<ellipse cx="24" cy="45.5" rx="16" ry="1.5"/>
<circle cx="24" cy="21.5" r="20"/>
<ellipse cx="36" cy="26.5" rx="2.5" ry="1.5"/>
<ellipse cx="36" cy="26.5" rx="2.5" ry="1.5"/>
<ellipse cx="12" cy="26.5" rx="2.5" ry="1.5"/>
<circle cx="13.5" cy="20.5" r="1"/>
<circle cx="34.5" cy="20.5" r="1"/>
<path d="M24,38.5c5.6,0,10.3-4, ... />
<path d="M24,33.5c-3.2,0-6.1, .../>
```

This is what you will see in the browser window: a textual description of the image, specifying the coordinates and sizes of the shapes.



Credit: Emoji Smileys image:Wikimedia

The browser reads the description and renders the image. This is what you will see in the browser:



Mix up an emoji (in your browser)

Steps	Instructions
In the Inspector window (Firefox) or Elements window (Chrome), select individual shapes (circles, ellipses, paths) and modify their attributes.	Click on the code for a shape to select it. Double-click on any of the attributes in the code to modify it: (cx,cy) is the centre of a circle or ellipse r is the radius of a circle rx and ry are the radii of an ellipse
	For example, select a circle and change cx="24" to cx="28" or r="20" to r="30". You can delete a shape by clicking on its code (selecting it) and then pressing the Delete key.

Undo (Ctrl ⊕ Z) and redo (Ctrl ⊕ Y).



Mix up an emoji (in your browser)

Steps	Instructions
In the Inspector window (Firefox) or Elements window (Chrome), select individual shapes (circles,	Click on the code for a shape to select it. You should be able to see its styling attributes (like colour) in the Styles window. For example:
ellipses, paths).	.tongue { fill: rgb(255, 135, 175); stroke: rgb(69, 65, 60);
	Modify the RGB values for the fill or stroke attributes to change the colours:
	fill is the fill colour of a shape and stroke is the stroke colour of a shape

Mix up an emoji (in your browser)

If you like your mixed-up emoji, you can save it as: mixedup.svg.

The keyboard shortcut Ctrl

S should open the file selection menu, no matter which browser you are using. Select the name of the folder that you will be saving to.



Part 1: Calculate (uncompressed) image size

The image file kingfisher.bmp has a resolution of 1024x720. Its colour depth is 24 bits.

Steps	Instructions
Use this information to compute the number of bits required to represent this image.	Write your answer here:
Convert this size to bytes and then to megabytes.	Write your answer here:



Part 1: Calculate (uncompressed) image size

Steps	Instructions
Locate the image file kingfisher.bmp. What is the actual size of the file, in megabytes (MB)?	Use a file manager to locate the image file. Right-click on the file and view its Properties to see its size. Write your answer here:
Is the size that you computed in Step 1 identical (or even similar) to the actual size of the file?	Write your answer here:



Part 2: Compression

Steps	Instructions
Locate the image file kingfisher.bmp. What is the actual size of the file, in megabytes (MB)?	Use a file manager to locate the image file. Right-click on the file and view its Properties to see its size. Write your answer here:
Open the image file kingfisher.bmp in GIMP.	Use the menus: File > Open Or Use the keyboard shortcut: Ctrl ⊕ O



Part 2: Exporting image

Steps	Instructions
Export the image to a new file format, as kingfisher.80.jpg.	Use the menus: File ▷ Export As
	Or Use the keyboard shortcut: Ctrl Shift E
	Then, specify the file name for the new image file.
	In the Export Image as JPEG dialogue, set the Quality to 80 and click the Export button.



Part 2: Compression

Steps	Instructions
Locate the new image file kingfisher.80.jpg. What is the size of the new image file, in megabytes (MB)?	Use a file manager to locate the new image file. Right-click on the file and view its Properties to see its size. Write your answer here:
The new image file has the same resolution and the same colour depth as the original image. How can you explain the substantial difference in size between the two files?	Write your answer here:



Part 2: Exporting image

Steps	Instructions
Export the image to a new file format, as kingfisher.20.jpg.	Use the menus: File > Export As
	Or Use the keyboard shortcut: Ctrl Shift E
	Then, specify the file name for the new image file.
	In the Export Image as JPEG dialogue, set the Quality to 20 and click the Export button.



Part 2: Compression

Steps	Instructions
Locate the new image file kingfisher.20.jpg. What is the size of the new image file, in megabytes (MB)?	Use a file manager to locate the new image file. Right-click on the file and view its Properties to see its size. Write your answer here:
Zoom in on the image to see how the low level of quality that you selected while exporting has affected the way in which details are rendered.	Make sure that the Toolbox has been activated. Use the menus: Windows ▷ Toolbox Then, select the Zoom tool. Click on any part of the image to zoom in. Control-click on the image to zoom out.



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