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9.30.2017

ICT 4510

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**Module 6 Discussion Questions**

1. List the common uses of the HTML5 canvas element:
   1. The canvas element in HTML5 is new and exclusive to the HTML5 syntax. The element itself does not function without utilizing its API in JavaScript. To simply put it, it allows you to draw graphics onto a webpage or even text. These graphics or text can be stylized and animated as well or even be interactive for games or applications if desired by the designers and developers. In order to use the canvas, you need to be able to get the context and use the different features of the API. Most of the time, you will be using the 2D context to be able to draw and animate two-dimensional objects onto the canvas. Most of the stylizing will be done with similar or identical property names to CSS like borderColor, fontSize, fillStyle and many more.
2. What is the canvas context?
   1. There are two main contexts to the HTML5 canvas element. As mentioned above, most of the time, developers will be using the 2D context. However, there are also contexts available like a three-dimensional context. Instead of directly referring to this as the 3D context, it is known as WebGL. As defined by the Mozilla Developer Network, WebGL enables web content to use an API based on OpenGL ES 2.0 to perform and render both 2D and 3D images into an HTML canvas element without the use of plugins. Most of the time, you will be using the 2D context that will be called by the getContext() method from the canvas JavaScript API. Using the two-dimensional context, developers can draw rectangles, text, images, and other objects into the canvas element. It provides the 2D renderings. You can use different methods for drawing or clearing rectangles, text and strokes, lines with widths and heights as well as styles, and even different fonts or gradients. Different uses of the canvas and its context other than these are for interactive and or animated applications or games. In the past, it was popular for web browser games to be written in Java or Flash/ActionScript, which is very similar to JavaScript but are two different languages. Now, using Vanilla JS, you can use the canvas and completely code a game from scratch. Using libraries like the P5.js library, you can initialize and manipulate the canvas with shapes and animation very quickly and with minimal code. This is an extremely new and powerful feature of both HTML5 and JavaScript. It is just a matter of learning and using the canvas API.
3. What methods are used to draw a rectangle?
   1. To draw a simple rectangle in the canvas, you do not need many lines of code. When you insert the canvas HTML5 element into your code and give it an ID, you need to reference it in your code and assign the element to a variable. Once that has been done, you make a variable for the context and then call the canvas element variable and chain the getContext method to the canvas element. Now, the context variable is holding the canvas element’s context, most likely 2d. Then, you take the context variable and can chain the .rect() method which takes four parameters. Each of these are the x and y coordinates of the rectangle on the canvas and the last two are the width and height of the rectangle (in pixels). In order to begin this drawing, you need to reference the .beginPath() method and then can stylize the rectangle with different properties like line width and stroke style. After referencing your styles like color and line width, you then call the .rect() method with the given parameters. Finally, you reference the .stroke() method and it will draw your image to the canvas using nothing but JavaScript. It’s awesome! We used this API and element in the ICT 4570 Web Scripting with JavaScript. We really got to the see the power and usefulness that the canvas element in HTML5 and the JavaScript code can bring. I want to learn now how to pull more libraries like P5 and or Chart.js into my code to be able to draw onto the canvas quicker and more uniquely.