# ECAP472

# Web Technologies

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# Learning Outcomes

After this lecture, you will be able to

- learn about HTML <canvas> element.
- practical Implementation of HTML <svg> element.

# What is Canvas?

- The HTML5 canvas element can be used to draw graphics on the webpage via JavaScript. The canvas was originally introduced by Apple for the Mac OS dashboard widgets and to power graphics in the Safari web browser. Later it was adopted by the Firefox, Google Chrome and Opera. Now the canvas is a part of the new HTML5 specification for next generation web technologies.

# What is Canvas?

- By default the <canvas> element has 300px of width and 150px of height without any border and content. However, custom width and height can be defined using the CSS height and width property whereas the border can be applied using the CSS border property.

# Understanding Canvas Coordinates

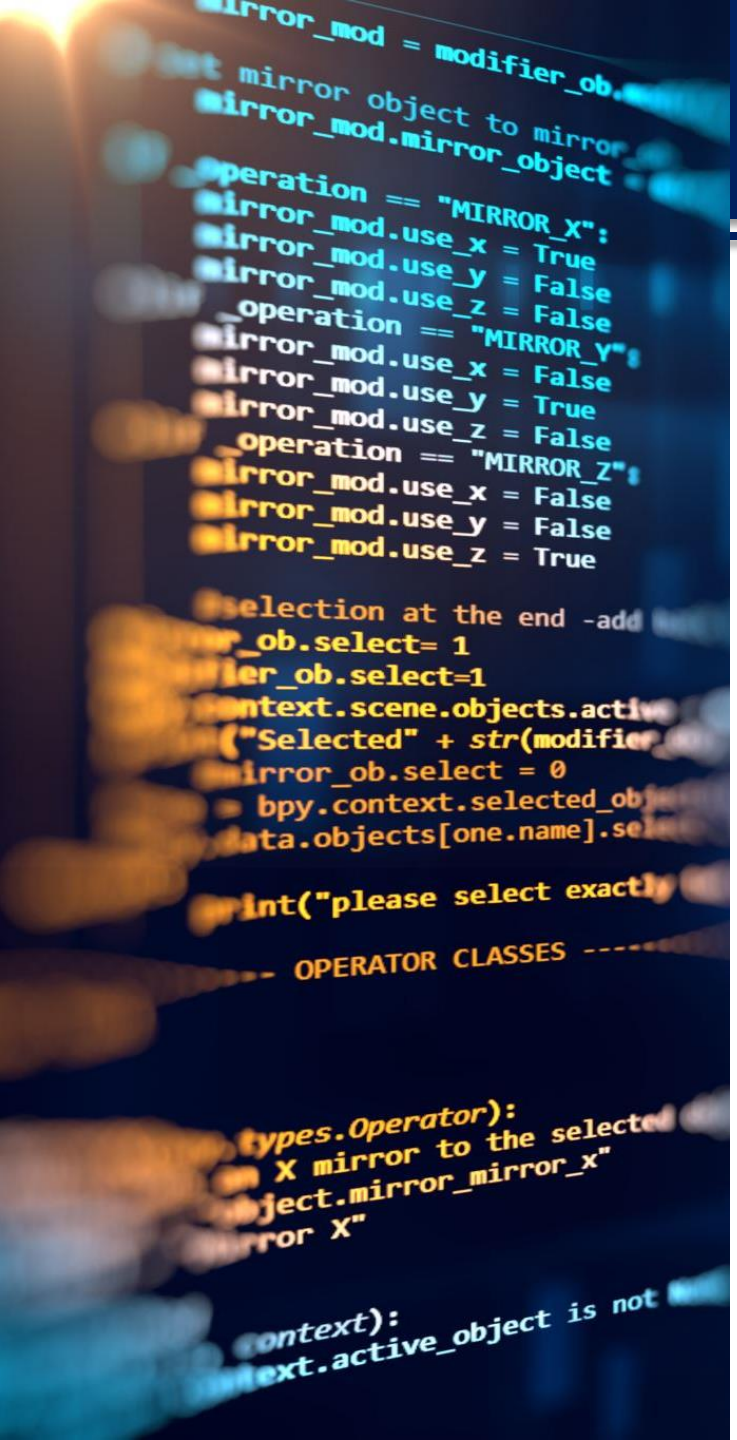
- The canvas is a two-dimensional rectangular area. The coordinates of the top-left corner of the canvas are (0, 0) which is known as origin, and the coordinates of the bottom-right corner are (canvas width, canvas height). Here's a simple demonstration of canvas default coordinate system.

# Something Cool The Canvas Can Do

- Easily takes a hidden video from
- the HTML page, displays it
- multiple times, moves each copy
- Independently it around
- the screen, while playing it.

# What is the HTML5 Canvas?

- The *HTML5 Canvas* is an *Immediate Mode* bit-mapped area of the screen that can be manipulated with JavaScript and CSS.




# What Is Immediate Mode?

- *Immediate Mode* refers to the way the canvas renders pixels on the screen. The *HTML5 Canvas* completely redraws the bitmapped screen on every frame using Canvas API calls from JavaScript. As a programmer, your job is to set-up the screen display before each frame is rendered.

# What Is Retained Mode?

- Flash, Silverlight, and DOM  manipulation techniques use Retained Mode. In Retained Mode a list of individual display objects is stored and manipulated.

# HTML5 Canvas Support

- Support for the Canvas is growing.
  - Chrome
  - Safari (Mac and iOS 5)
  - I.E. 9 (surprised?)
  - Firefox
  - Opera

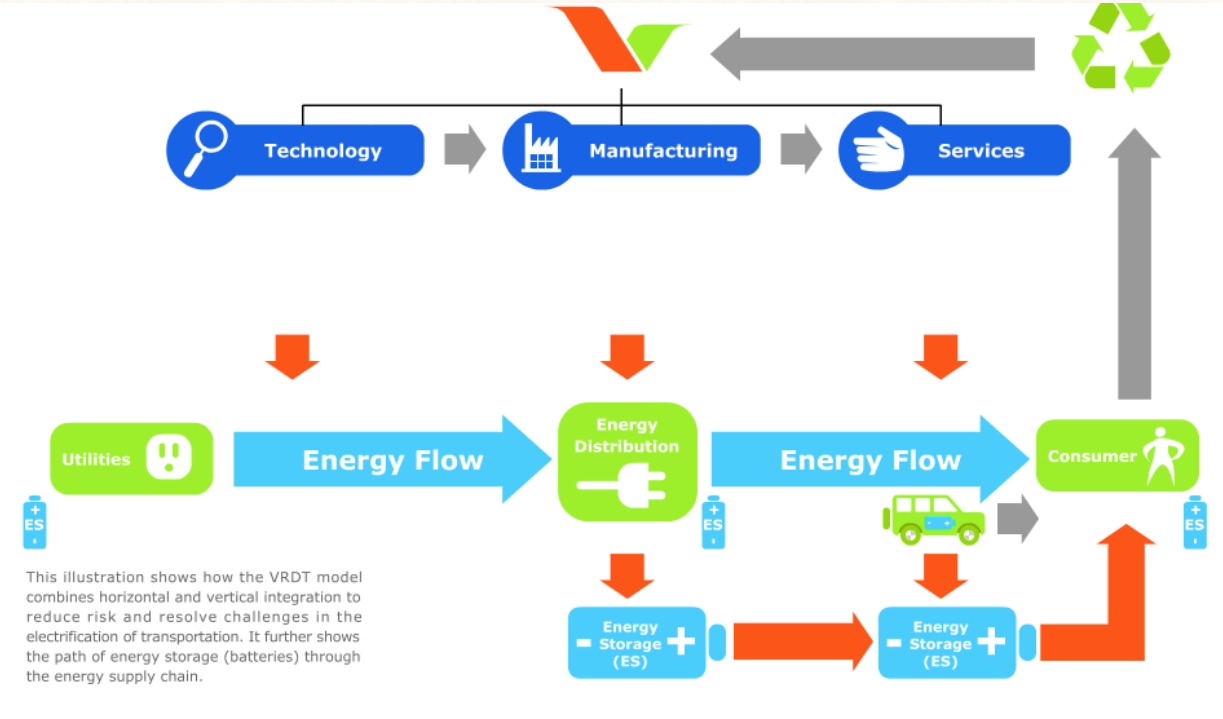
# What Can The Canvas Be Used for?

- Nearly anything that Flash notorious for:
  - Banner Ads
  - Animated Landing Pages
  - Web Games
  - Video

# Canvas Banner Ad

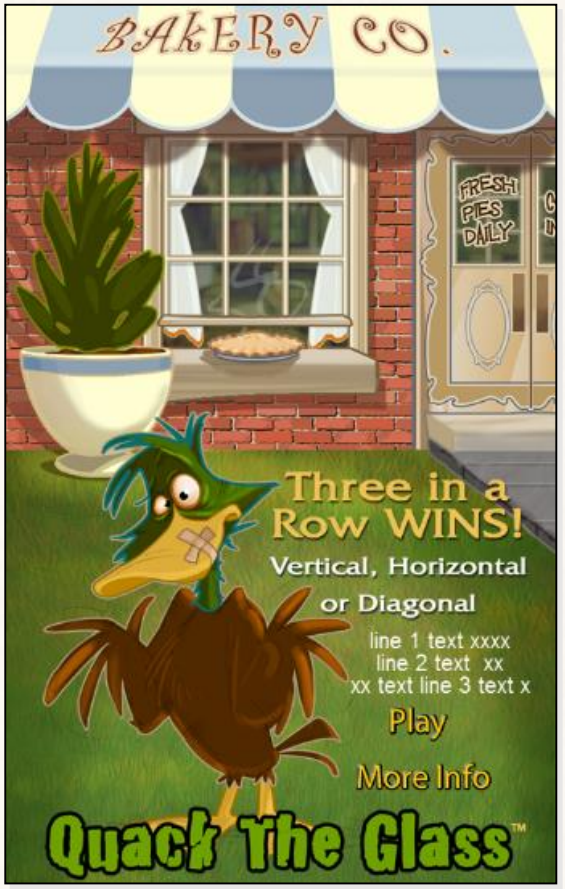
- Should be put in an <iframe>
- PNG sequence but could easily be dynamically generated Canvas text

# Animated Landing Pages



# Web game

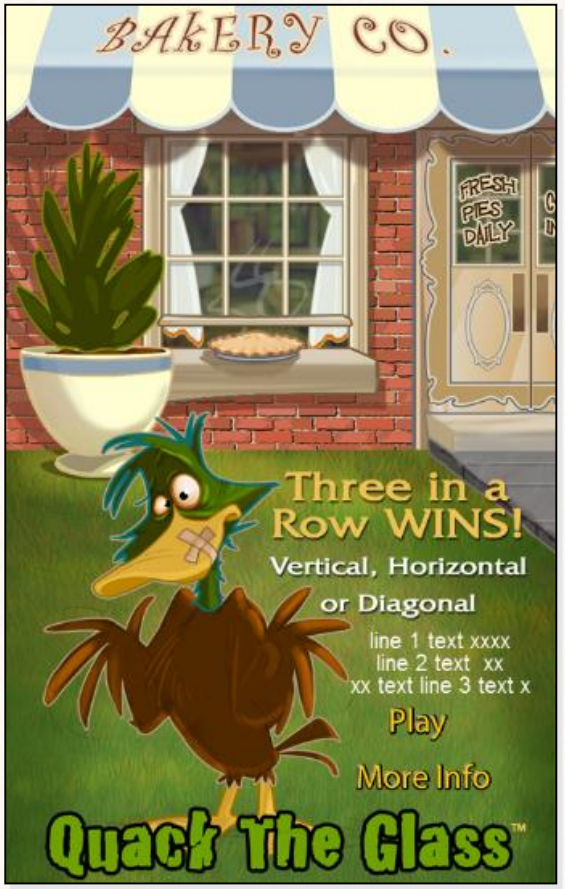
Targets all HTML5 devices



# Web game

Targets all HTML5 devices

Mobile/Web

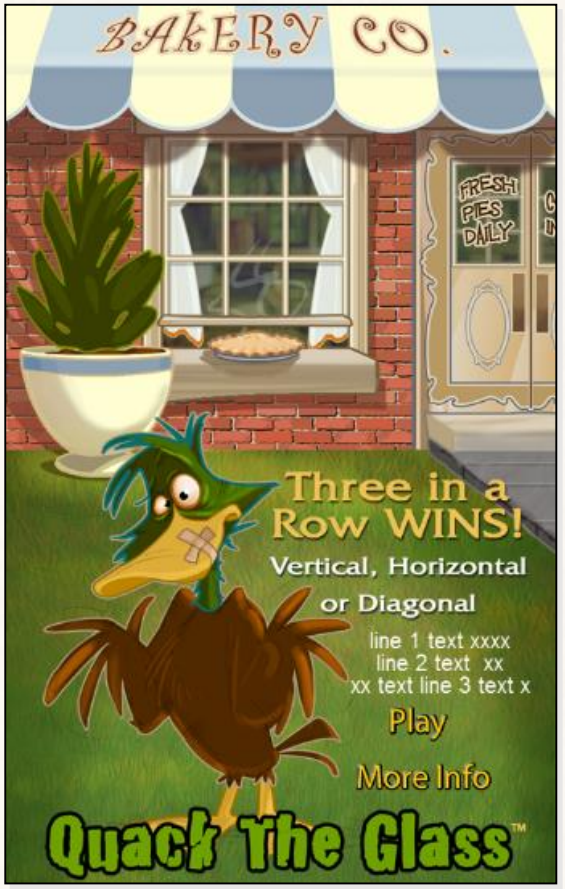


# Web game

Targets all HTML5 devices

Mobile/Web

Touch Controls Only



# Video

Video played

# Video

Video played

Directly on Canvas

# Video

Video played

Directly on Canvas

Can Create frame counter

# Video

Video played

Directly on Canvas

Can Create frame counter

To trigger events

# A Quick Guide To Canvas Development

- Next we will describe the Canvas element, its' properties and methods, then show how to create a simple Canvas application

# HTML5 Canvas Properties

- Canvas Has Three Properties:
  - width
  - height
  - id
- Width and height read/write which means you can resize the Canvas on the fly

# HTML5 Canvas Methods

- getContext() : You need the context to draw anything on the Canvas.
- toDataUrl() : Outputs the bitmapped data of the Canvas to a string (can be used to create a screenshot)

# HTML5 Canvas And CSS

- CSS can be used in conjunction with Canvas object itself. However, individual drawings on the Canvas cannot be manipulated with CSS
- Example: you can scale the Canvas using CSS

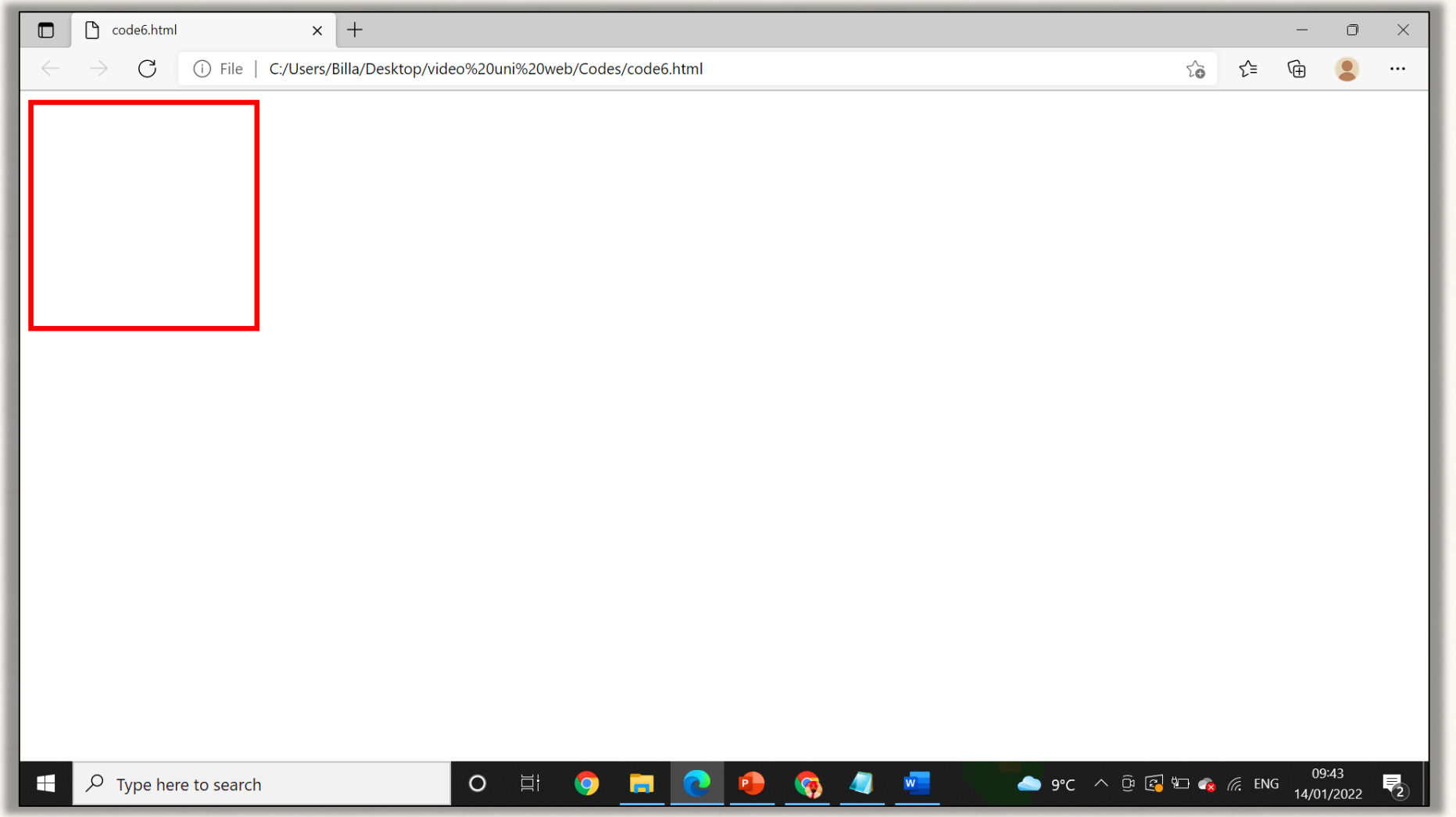
  style="width: 400px; height:400px"

- Does not resize but instead scales (like setting width ad height for a Flash embed)

# Basic Canvas

```
<!DOCTYPE html>
<html>
    <body>
        <canvas id = "Ani" height = "200" width = "200"
            style = "border:5px solid red">
        </canvas>
    </body>
</html>
```

# Output


code6.html
File | C:/Users/Billa/Desktop/video%20uni%20web/Codes/code6.html
Type here to search
9°C
ENG
09:43
14/01/2022

# What is SVG?

- SVG stands for Scalable Vector Graphics
- SVG is used to define graphics for the Web
- SVG is a W3C recommendation

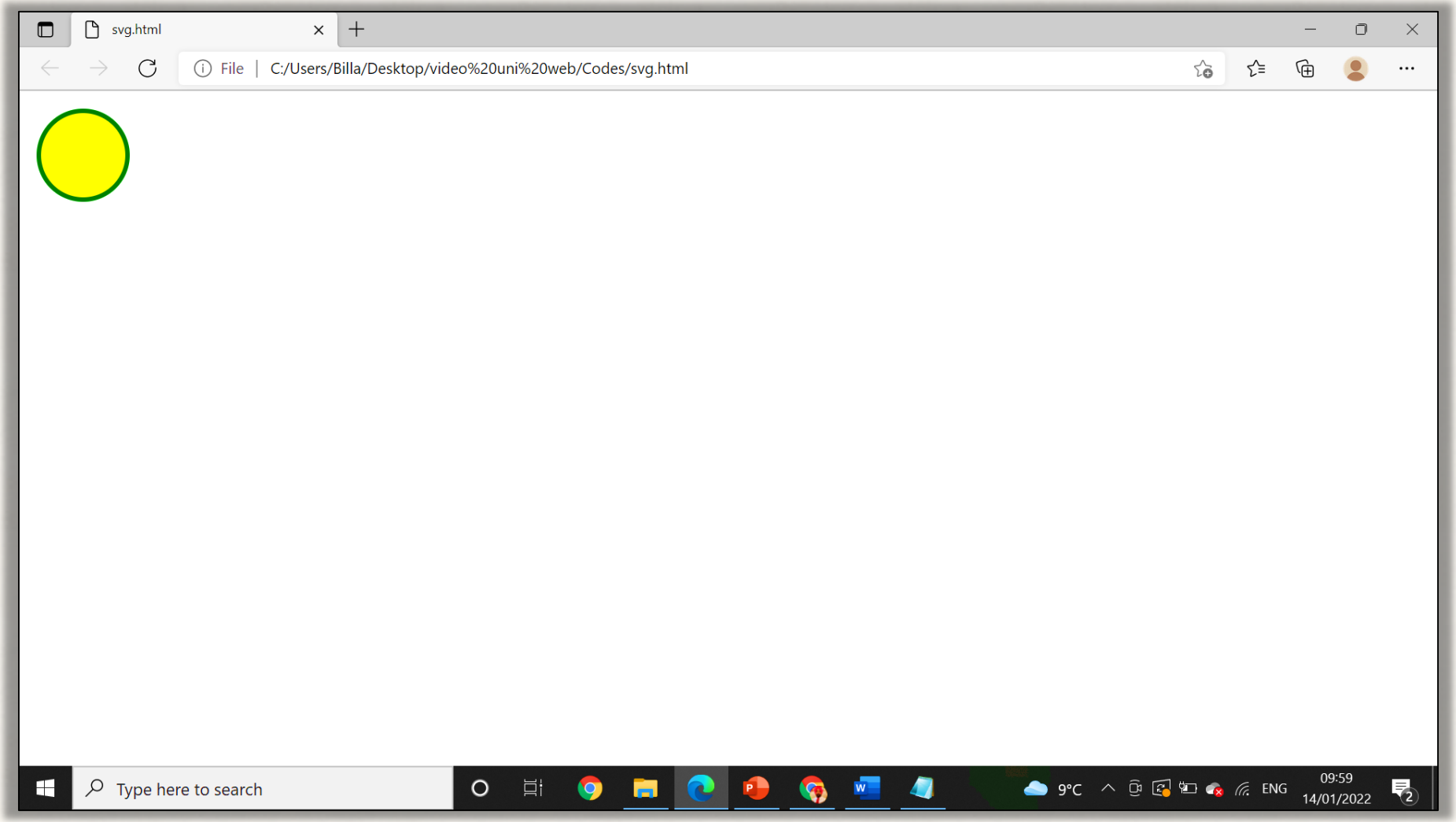
# The HTML <svg> Element

- The HTML <svg> element is a container for SVG graphics.
- SVG has several methods for drawing paths, boxes, circles, text, and graphic images.

# Example

- <!DOCTYPE html>
- <html>
- <body>
- <svg width="100" height="100">
- <circle cx="50" cy="50" r="40" stroke="green" stroke-width="4" fill="yellow" />
- </svg>
- </body>
- </html>

# Output


svg.html
File | C:/Users/Billa/Desktop/video%20uni%20web/Codes/svg.html
Type here to search
9°C
ENG
09:59
14/01/2022

# Practical

That's all for now...