**Due** Sunday by 11:59pm **Points** 0 **Available** Dec 3 at 12am - Dec 9 at 11:59pm 7 days

# Make-up Assignment

## Purpose

Students will create an animated scene using the HTML5 Canvas and JavaScript.

Students will have their **lowest** module assignment grade **replaced** by the grade earned on this **optional** assignment.

## Related Module Objectives

This assignment satisfies Module Objectives 1, 2, 3, 4, 5, 6, 7 and 8.

## Possible Points

This assignment is worth a maximum of 100 points.

## Important Notes

Students are strongly encouraged to refer to the example code provided in the Linear Motion tutorial, which is in the **Animation section** of the **www.html5canvastutorials.com (http://www.html5canvastutorials.com)** website. This tutorial will provide a good starting point for the assignment.

## Required Tools

Students will be required to use one or more of the following tools to earn a passing grade on this module assignment. Each of the tools listed below can be downloaded for free or already exist in the indicated

operating system.

- Web browser (Chrome or Firefox recommended)
- Basic text editor
  - Notepad++ (Windows)
  - TextEdit in plain-text mode (Mac OS)
  - pico or vi (Linux)
- Secure Shell (SSH) client
  - PuTTy (Windows)
  - ssh (Mac OS and Linux)
- File transfer tool (must support SFTP via SSH - **DO NOT USE FTP**)
  - WinSCP (Windows)
  - CyberDuck (Mac OS)
  - sftp (Linux)

## Warnings

Students must complete this assignment without the assistance of third-party development tools or frameworks such as jQuery or Bootstrap. Assignments that appear to be the product of third-party development tools or frameworks (professor's discretion) will receive **0** points.

## Directions

Review the requirements listed in the Assignment Requirements section
Create a web page that meets all of the stated requirements
Complete the assignment before the due date (refer to the Course Schedule)
  - Note: Students will not submit anything to Canvas.

## Assignment Requirements

**Project Description**

Students will create an animated scene using the HTML5 Canvas and JavaScript. Students will demonstrate their proficiency with creating JavaScript objects, adding text and shapes to the HTML5 Canvas, moving text and shapes around the Canvas, changing the direction of shapes, and changing the color of text and shapes.

Preliminary Tasks

- Log onto the **Course Web Server**
- Create a folder called images in the **module1** folder
  - Store all of the pictures used in your web pages for this assignment in the **images** folder
    - Use relative URLs to access the pictures

Animated Web Page (100 points)

Create an **Animated Canvas** web page with the filename **index.html** in the **make-up** folder.

- Give the page a descriptive title
- Display your name along the top of the page using an **<h2>** tag
- Add a canvas to the page
  - Set **width** to **1000**
  - Set **height** to **800**
- Add the following **controls**:
  - Two (2) buttons
    - Increase Radius
      - Set the **onclick** event to call the JavaScript function **changeRadius(true)**
    - Decrease Radius
      - Set the **onclick** event to call the JavaScript function **changeRadius(false)**
- At the bottom of the page, include a hyperlink to your **ePortfolio**
  - Use a relative URL for the **ePortfolio** link
- Add a **<script>** tag to include all of the related JavaScript code immediately above the **</body>** tag
  - Note: Most of the work is handled by the JavaScript code

JavaScript Objects

| Object | Properties | Initial Value | Min Value | Max Value |
|---|---|---|---|---|
| Circle | borderColor | black | | |
| | borderWidth | 2 | 1 | 5 |
| | color | blue | | |
| | radius | 25 | 5 | 50 |
| | x | 25 | 25 | Canvas.width - 25 |
| | y | 25 | 25 | Canvas.height - 25 |
| Text | color | red | | |
| | text | UNF | | |
| | x | 0 | 0 | Canvas.width - text.width |
| | y | 100 | 100 | 100 |

JavaScript Functions

Note: Include each of these JavaScript functions within the <script></script> tags in the **index.html** file.

- animate(canvas, context)
  - This function draws the current state of the HTML Canvas
  - Input
    - canvas - The HTML Canvas object
    - context - The Context object
  - Process
    - Call the JavaScript function **testBorderTouch**([canvas])
    - Update the **current position** (x and y properties) of the **Circle** object
    - Update the **current position** (x property) of the **Text** object
    - Clear the HTML Canvas area
    - Call the JavaScript function **drawCircle**([circle object], [context])
    - Call the JavaScript function **drawText**([text object], [context])
    - Request a new animated frame
      - Hint: Refer to the **Linear Motion** (https://www.html5canvastutorials.com/advanced/html5-canvas-linear-motion-animation/) tutorial code in the Animation section of the **www.html5canvastutorials.com** (http://www.html5canvastutorials.com) website
  - Output
    - None

- changeRadius(increase)
  - This function reacts to clicking the Increase or Decrease Radius buttons
  - Input
    - increase - A boolean value
  - Process
    - If **increase** is **true**
      - Increase the **radius** value of the **Circle** object by a given amount (i.e., 5)
      - Check if the increased radius value exceeds the max radius (see table above)
        - If radius value is **greater** than **max** radius, set radius value to **max** radius
    - If **increase** is **false**
      - Decrease the **radius** value of the **Circle** object by a given amount (i.e., 5)
      - Check if the decreased radius value exceeds the min radius (see table above)
        - If radius value is **less** than **min** radius, set radius value to **min** radius
  - Output
    - None

- drawCircle(circle, context)
  - This function moves the **Circle** object horizontally and vertically around the HTML Canvas
  - Input
    - circle - The Circle object
    - context - The Context object
  - Process
    - Update the **x** and **y** values of the **Circle** object

        - Draw a **Circle** on the Canvas using the **Circle** object values
            - Refer to the **Circle** (https://www.html5canvastutorials.com/tutorials/html5-canvas-circles/) tutorial code in the Shapes section of the **www.html5canvastutorials.com** (http://www.html5canvastutorials.com) website
    - Output
        - None

- drawText(text, context)
    - This function moves the **Text** object horizontally across the HTML Canvas
    - Input
        - text - The Text object
        - context - The Context object
    - Process
        - Update the **x** value of the **Text** object
        - Draw a string of **Text** on the Canvas using the **Text** object values
            - Refer to the **Font, Size & Style** (https://www.html5canvastutorials.com/tutorials/html5-canvas-text-font-size/) tutorial code in the Text section of the **www.html5canvastutorials.com** (http://www.html5canvastutorials.com) website
    - Output
        - None

- testBorderTouch(canvas)
    - This function causes the **Text** object to **move** across and the **Circle** object to **bounce** around the HTML Canvas
    - Input
        - canvas - The HTML Canvas object
    - Process
        - Change direction if **Circle** object touches the **Canvas border** (left, right, top, bottom)
            - If the **Circle** object touches either the **left** or **right** border, change the **horizontal** direction of the **Circle** object
            - If the **Circle** object touches either the **top** or **bottom** border, change the **vertical** direction of the **Circle** object
        - Change color if **Circle** object touches the **HTML Canvas border** (left, right, top, bottom)
            - If the **Circle** object touches the **left** border, change the **color** of the **Circle** object to **Blue**
            - If the **Circle** object touches the **right** border, change the **color** of the **Circle** object to **Red**
            - If the **Circle** object touches the **top** border, change the **color** of the **Circle** object to **Orange**
            - If the **Circle** object touches the **bottom** border, change the **color** of the **Circle** object to **Green**
        - Reposition the **Text** object if it exceeds the **right border**
            - Note: The width of the **Text** object is needed to reposition the **Text** object correctly
                - Refer to the **Text Metrics** (https://www.html5canvastutorials.com/tutorials/html5-canvas-text-metrics/) tutorial in the Text section of the **www.html5canvastutorials.com** (http://www.html5canvastutorials.com) website

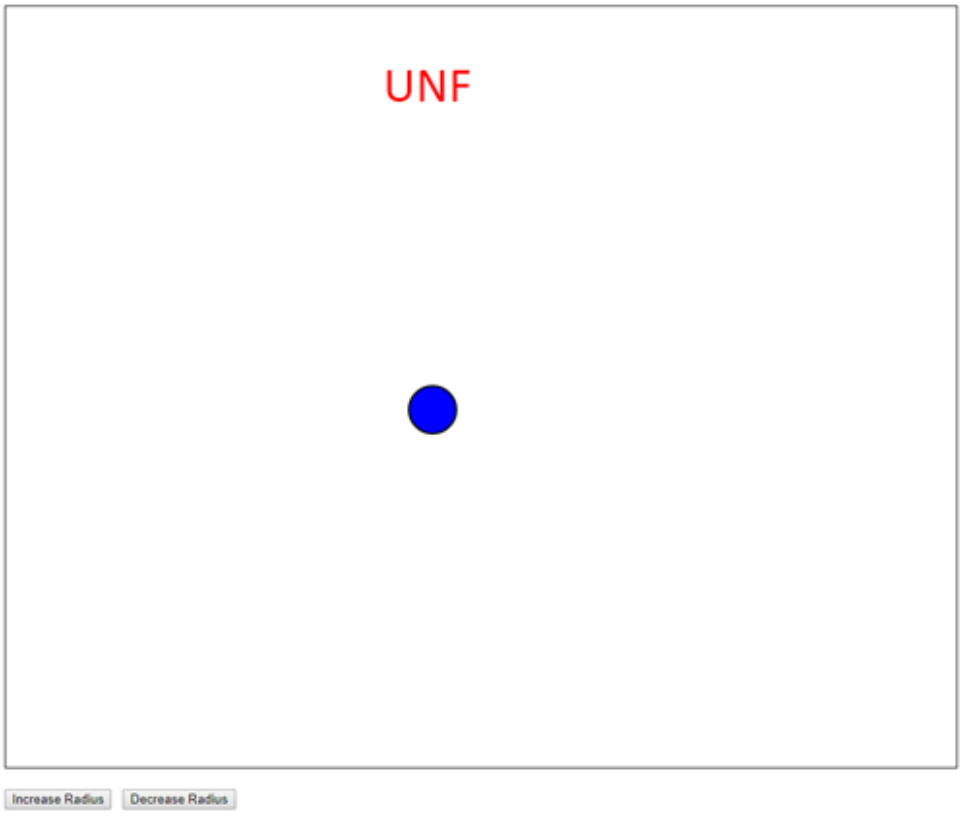
        - Hint: Only reposition the **Text** object if it **completely disappears** off of the HTML Canvas
        - Reposition the **Text** object so that is to the left, but **not visible** on the HTML Canvas
            - Hint: The transition from the right to the left should appear seamless
    - Output
        - None

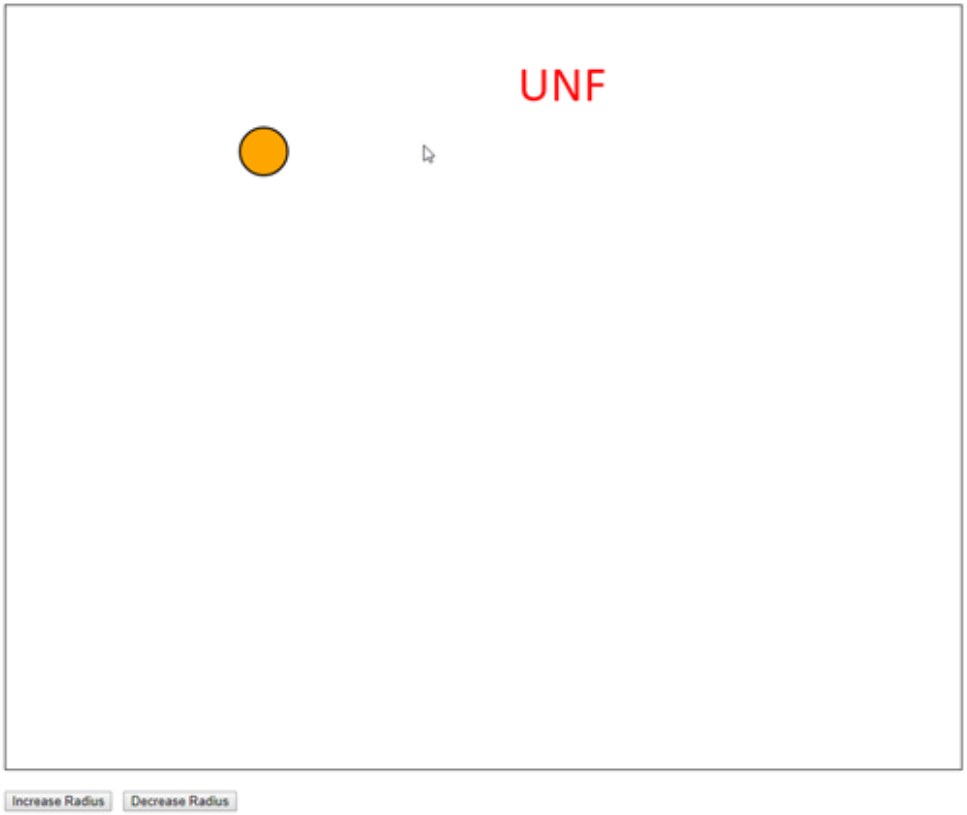
ePortfolio Page (0 points)

Update your **ePortfolio** webpage (index.html) in the **public_html** folder.

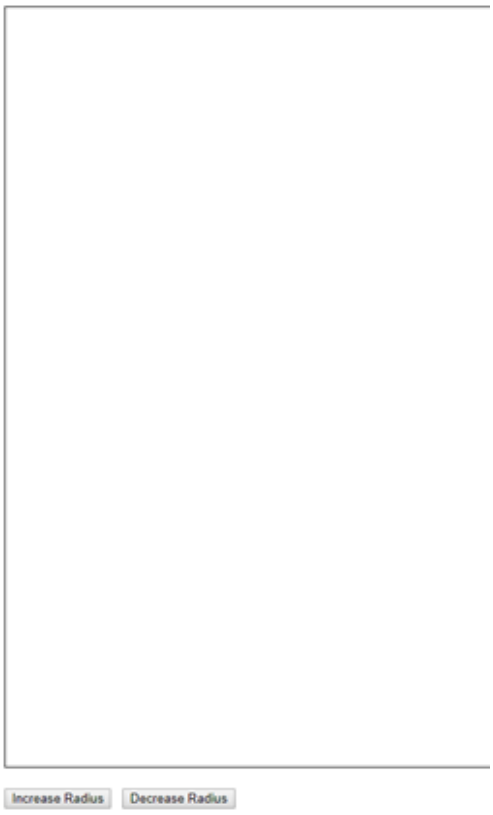
- Create a hyperlink using the existing text Make-up to open your **Animated** web page
    - Use a relative URL for the **Animated** web page link

**Examples**

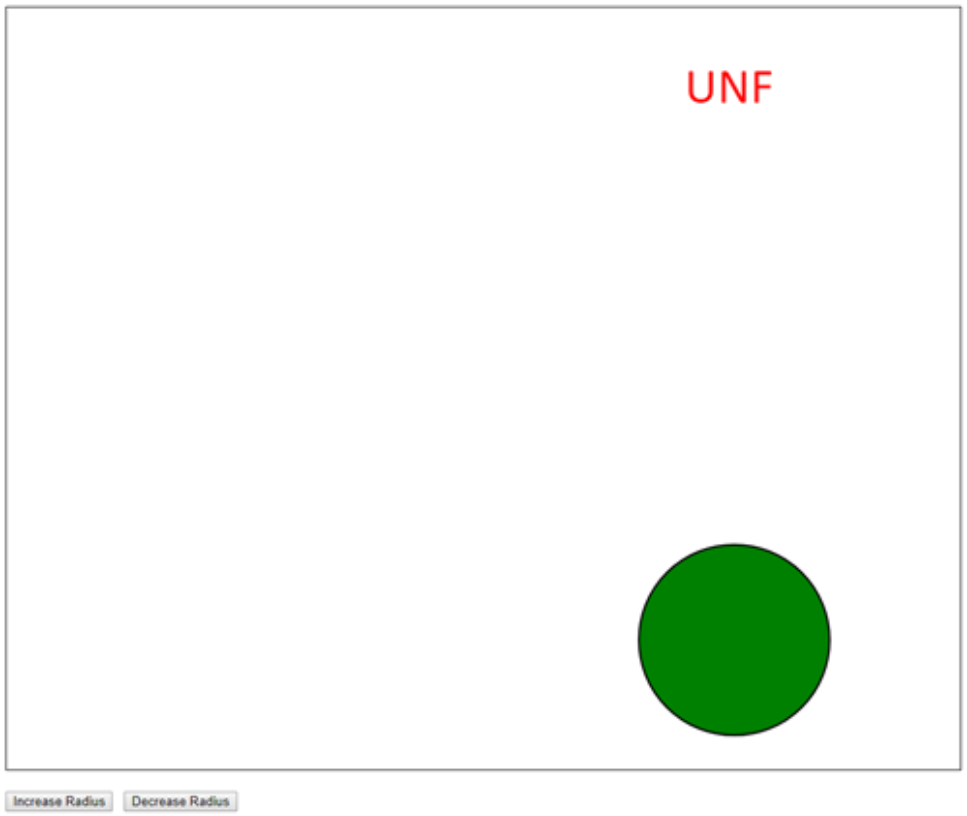
<table>
<tr>
<td> 
</td>
<td> 
</td>
</tr>
<tr>
<td>The Circle is traveling left to right.</td>
<td>The Circle is trave</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</table>



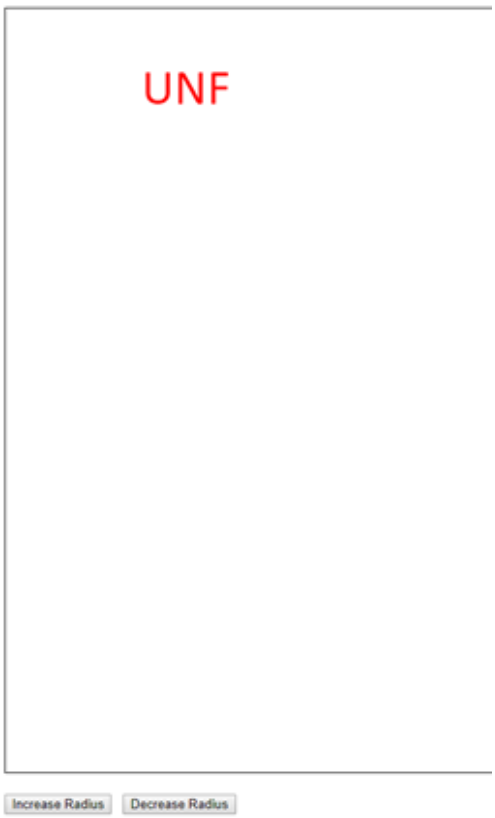

The Circle is traveling top to bottom.




The Circle is travel




Circle at maximum radius.




Circle at mini