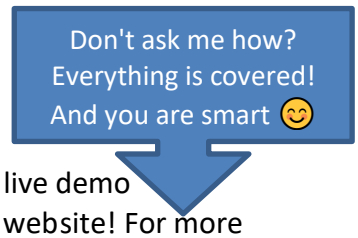
JavaScript
AWP- Lab Work 4 – JS Essential Review Part 2

Name: _____ **Mark: _____/100**

Important Notes:

- Use your Team group to work on this lab-work. Each team must work individually. For example, team1 members can work together they CANNOT work with or assist another member from a different team
- Although this lab-work is a team based, but each student must submit his/her work individually
- The lab-work should be **submitted (uploaded) before the due date** in order not to lose marks
- Follow the **exact naming rules** for all your variables as explained in the instructions
- The lab-work is intensively loaded with all the needed steps and instructions to solve the entire problem, but as we know, in programming we can use different logic or ways of coding to achieve the same task! so please feel free if you like/prefer to use other different ways or methods etc.
- **At the end of the lab-work**, you will end up by the following **single file: index.HTML**
- You will have:
  - Submit the html file to the lab work section on canvas:
  - Upload the html file to your GitHub with a Readme file that contains a link to the live demo
- **NOTE:** Make this repo to be a GitHub pages website to this lab not your main GitHub website! For more information refer to my Zoom recording about Git/GitHub or just review my PDF file



(5 Marks)

Lab-work Contents:

- You will create a single page for finding areas of the following 4 basic shapes:
  - Circle
  - Triangle
  - Square
  - Rectangle

- This lab-work will be demonstration of your skills in:
  - **Using basic HTML elements:**
    - Block and Inline Elements
  - **Internal/Embedded CSS:**
    - To be places in the head section of the page
  - **Essential JavaScript Concepts:**
    - Creating variable following JavaScript naming convention
    - Creating custom functions
    - Reading/output data from/to the document using DOM methods and properties
    - Converting string data type to integer/float numbers
    - Using some of the properties of Math object
    - Arithmetic operations with BEDMAS/PEDMAS Rules
      - B/P for Brackets or Parenthesis
      - E for exponential
      - DM for division and multiplications
      - AS for addition and subtractions
    - Handling events through HTML attributes

Lab-work Instructions:

This lab is consisted of three parts:

- Part1: HTML
- Part2: CSS
- Part3: JavaScript

Part 1: HTML file and Contents

1) Create a new **.html file (using the full Official HTML5 Template)**, then place your **internal JavaScript** code) Script element) immediately **before** **HTML Closing Body Tag </body>**:

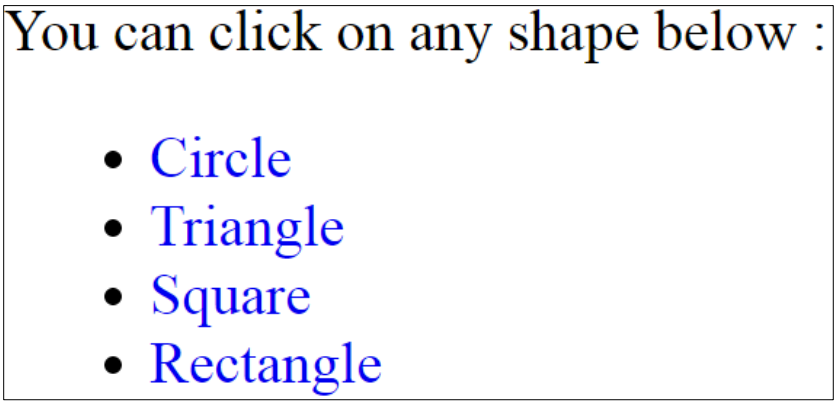
```
<body>

    // All your HTML elements have to be before the script element (before start coding)

    <script>
        // All your JavaScript code
    </script>
</body>
```

2) Save your **.html file** as **index.html** because of the GitHub pages
3) Creating the **HTML content**:
    a) A main division (div element) to wrap the entire page content
    b) In side the main div, add the following items:
        - **Heading 1:** with id value of "top" and the text "***Basic Geometry***"
        - **Paragraph:** with this text "***In this section, we are going to find the Area of some two-dimension shapes***"
        - **Another Paragraph:** with this text "***You can click on any shape below:***"
        - An **unordered list** with these items:
            - Circle ➔ It has a hyperlink that goes to the section element with id value of "circle"
            - Triangle ➔ It has a hyperlink that goes to the section element with id value of "triangle"
            - Square ➔ It has a hyperlink that goes to the section element with id value of "square"
            - Rectangle ➔ It has a hyperlink that goes to the section element with id value of "rectangle"

Sample Image Below:



Below is part of the html code as a sample to give you a hint:

```
<body>
    <div class="wrapper">
        <h1 id="top">Basic Geometry</h1>
        <p>In this section, we are going to find the Area of some two-dimension shapes</p>
        <p>You can click on any shape below:</p>
        <ul>
            <li><a href="#circle">Circle</a></li>
            <li><a href="#triangle">Triangle</a></li>
```

c) You will create four separate **<section> elements** for each shape using the HTML5 "section" element:

d) For example, first section for the "Circle Shape":

- Give the section element an id with the value of "circle"

```
<section id="circle">


</section>
```

- Add Heading 2 with the text: Circle Area

```
<h2>Circle Area</h2>
```

- Add div element that contains:
  - **Label:** "Enter the value of the circle's radius:" for the input box with id value of "radius"
  - **Input Element:** of type "text" with id value of "radius"

```
<div>
    <label for="radius">Enter the value of the circle's radius:</label>
    <input type="text" id="radius">
</div>
```

- Add another div element that contains:
  - **Label:** "Result:" for the input box with id value of "circle-area"
  - **Input Element:** of type "text" with id value of "circle-area". Make it **"readonly"**
  - Add a horizontal line at the end of the div element

```
<div>
    <label for="circle_area">Result:</label>
    <input type="text" id="circle-area" readonly>
</div>
<hr>
```

- Add a button element with text "Calculate" and use the click event **"onclick"** to trigger/run/call the required function for calculating the circle area ***(you will add it)***

```
<button Adding the required event to call the required function>Calculate</button>
```

e) Following the same HTML elements (to keep the consistency), you will create the other 3 sections.
- Notice that all the sections will have:
  - Different labels based on the required input values to find the area for each shape
  - **Label:** "Result:" for read-only input box to display the area value of that shape
  - **Input Element:** of type "text" with id value of "ShapeName-area". Make it "readonly"
  Notice that the "ShapeName" will be changed to: triangle, square, and rectangle

```
<div>
    <label for="?">Result:</label>
    <input type="text" id="?" readonly>
</div>
<hr>
<button onclick="?">Calculate</button>
```

f) **At the end each <section> element,** you need to add the following **div** element:
- Has a class value of **"go"**
- Inside the div add <a> element with **href** value for going to the element with id value of "top"

```
<div class="go">
    <a href="#top">Go to top</a>
</div>
```

(10 Marks)

Part 2: Cascading Style Sheet

1) Add an internal (embedded) style with some **CSS rules** to your contents:

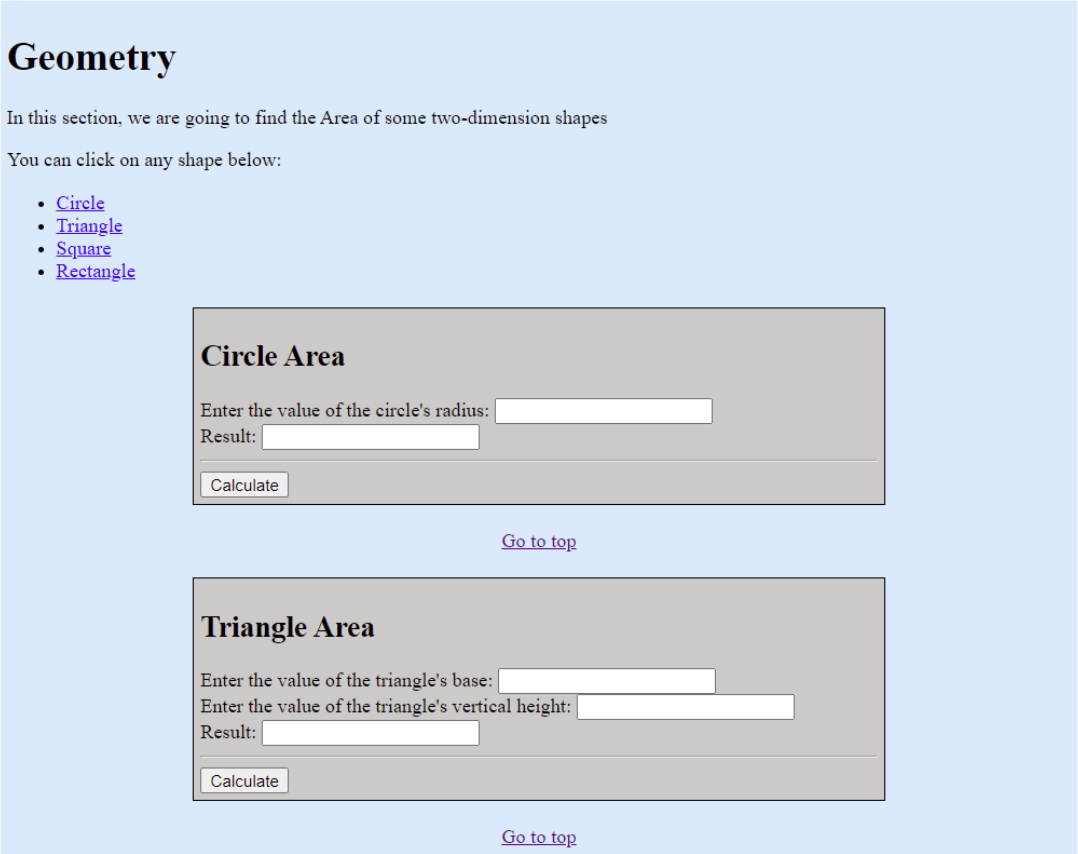
a) Targeting the main div (the main container for your page):
- Width of 70%
- Any Background Color
- Centre the div horizontally and vertically (Using the same trick from the HTML lectures)

b) Targeting each section element:
- Width of 65%
- Any Background Color
- Any Border Styles
- Margins of 20 pixels from top/bottom and center the element horizontally

c) Targeting both the main div (the main container) and the section element:
- Padding of 5 pixels from all sides
- Use the CSS3 property to include the border size and the padding within the element width
  Hint: the CSS3 property name is "box-sizing"

d) Targeting the div with class value of "go":
- Center its text content

Below is part of the page after applying the required CSS rules as a sample:



(10 Marks)

Part 3: JavaScript

1) Inside the **script element**, you will create **4 functions** as descried below:
   a) Function named "circleArea():
      - This function is triggered when the Circle link is clicked
      - Using DOM to get the value of radius from the required input box
      - Make sure to
        - **Remove all the extra spaces** before and after the user input using a built-in JS function
        - **Convert the value from text (string data type) to a number** using an appropriate built-in JS function
      - Write the code for finding the circle area using the following formula
      - **The formula: Area = π r^2 ➔ Area = PI x r x r**
        r = radius
      - You can calculate the area and save the result into variable
      - Using DOM output the value of the formula result which is the area into the read only input bx of the circle area in the page

      Hint: To find the value of the **PI (π)** use the JavaScript **Math object** (search it)

The function logic could be like this:

```
function circleArea() {
// Getting the value of the radius with DOM:
// Trimming the white space if any, then convert the value to a numeric data type
// create a new variable for the aria and assign the formula of the circle to it
// new variable = Pi-Value * (radius)² variable (the value that user has just inserted)
// use document.getElementById with innerHTML to write the result into your HTML page
}
```

b) Function named "triangleArea():

- This function is triggered when the "Triangle" link is clicked
- Using DOM to get:
  - the value of the triangle's base from the required input box
  - the value of the triangle's vertical height from the required input box
- Make sure to
  - **Remove all the extra spaces** before and after the user input using a built-in JS function
  - **Convert the value from text (string data type) to a number** using an appropriate built-in JS function
- Write the code for finding the triangle area using the following formula
- **The formula: Area = ½ × b × h**
  b = base
  h = vertical height
- You can calculate the area and save the result into variable
- Using DOM output the value of the formula result which is the area into the read only input bx of the triangle area in the page

c) Function named "squareArea():

- This function is triggered when the "Square" link is clicked
- Using DOM to get the value of radius from the required input box
- Make sure to
  - **Remove all the extra spaces** before and after the user input using a built-in JS function
  - **Convert the value from text (string data type) to a number** using an appropriate built-in JS function
- Write the code for finding the circle area using the following formula
- **The formula: Area = π r^2 ➔ Area = PI x r x r**
  r = radius
- You can calculate the area and save the result into variable
- Using DOM output the value of the formula result which is the area into the read only input bx of the circle area in the page

The same idea/logic for the Square and Rectangle Shapes:

You will follow the same steps:

- Creating a function for each shape
- Asking the user to input the required information/values for each formula
- Remove the extra spaces before/after
- Writing the code for finding the area for each shape
- Output the result in the corresponding read-only input field.

Square:

The formula: Area = a^2 ➔ a x a
a = length of side

Rectangle:

The formula: Area = w × h
w = width
h = height

(75 Marks)

Happy Coding 😊