

Forms, Graphics, and Interactive Elements

ABSTRACT

Forms and input elements enable data collection through various input types and attributes. SVG graphics provide scalable shapes like lines, circles, rectangles, and polygons for visual design. Image maps using <map> and <area> add interactivity by linking specific image regions. Together, these elements enhance usability, graphics, and user interaction on the web.

HTML Forms <form>

- ✓ <form> is a HTML element to collect input data with containing interactive controls. It provides facilities
 to input text, number, values, email, password, and control fields such as checkboxes, radio buttons,
 submit buttons, etc
- ✓ Forms are generally used when you want to collect data from the user. For example, feedback form, login form, complaint form, inquiry form etc.

Form tags

Tag / Element	Description	Syntax / Example
<form></form>	Container used to collect and submit user input to a server.	<form action="/submit" method="post"> form elements </form>
<fieldset></fieldset>	Groups related form elements together inside a box.	<fieldset></fieldset>
<legend></legend>	Caption/title for a <fieldset>.</fieldset>	<fieldset> <legend>Login Details</legend> </fieldset>
<input/>	General input field (text, password, number, etc.).	<input type="text"/> <input type="email"/>
<textarea></th><th>Multi-line text input field.</th><th><textarea rows="20" cols="30">Enter your message</textarea>		
<button></button>	Clickable button (can be submit, reset).	<button type="submit">Submit</button>
<label></label>	Defines a label for form elements; improves accessibility.	<label for="uname">Username:</label> <input type="text"/>
<datalist></datalist>	Provides a list of predefined suggestions for an <input/> .	<input list="browsers" name="browser"/> <datalist id="browsers"> <option value="Chrome"> <option value="Firefox"> </option></option></datalist>
<select></select>	Creates a drop-down list.	<select name="cars"> <option value="volvo">Volvo</option> <option value="bmw">BMW</option> </select>
<option></option>	Defines an item inside a <select> or <datalist>.</datalist></select>	<select> <option value="html">HTML</option></select>

		<pre><option selected="" value="css">CSS</option> </pre>
<optgroup></optgroup>	Groups related <option> elements inside a <select>.</select></option>	<select> <optgroup label="Frontend"> <option>HTML</option> <option>CSS</option> </optgroup> <optgroup label="Backend"> <option>PHP</option> <option>Python</option> </optgroup> </select>

Form Attributes

Attribute	Description	Default Value
action	URL where form data will be sent after submission.	"" (empty)
enctype	The enctype attribute specifies how the form-data should be encoded when submitting it to the server. Note: The enctype attribute can be used only if method="post".	application/x-www-form- urlencoded Form data is encoded as key-value pairs, joined with & and spaces converted to +.
method	HTTP method (GET or POST) used when submitting.	GET
type	Defines the type of <input/> (text, password, etc.).	text
name	Name of the field (used as key when submitting data).	"" (empty)
id	Unique identifier for an element	"" (empty)
value	Default value for an input.	"" (empty)
placeholder	Hint text shown inside an input before typing.	"" (empty)
required	Makes the field mandatory before form submission.	false
readonly	Field is visible but not editable; value is submitted.	false
disabled	Field is visible but inactive; value is NOT submitted.	false
checked	Pre-selects a checkbox or radio button.	false
maxlength	Maximum number of characters allowed.	Unlimited
minlength	Minimum number of characters required.	0
step	Defines intervals for numeric/date inputs (e.g., step='2').	1 (depends on input type)
min	Minimum allowed value for number/date inputs.	No restriction
max	Maximum allowed value for number/date inputs.	No restriction
multiple	Allows selecting multiple values (e.g., multiple files or emails).	false
accept	Specifies file types accepted in a file upload input.	All file types

Attribute	Description	Default Value
autocomplete	Enables or disables autocomplete suggestions.	on
autofocus	Automatically focuses on an input field when the page loads.	false
rows	Defines visible rows in a <textarea>.</td><td>No fixed default (browser-dependent)</td></tr><tr><td>cols</td><td>Defines visible width (columns) in a <textarea>.</td><td>No fixed default (browser-dependent)</td></tr><tr><td>selected</td><td>Pre-selects an option in a <select> menu.</td><td>false</td></tr><tr><td>list</td><td>Connects an <input> with a <datalist> for suggestions.</td><td>None</td></tr></tbody></table></textarea>	

<input> Types

Input Type	Description	Syntax / Example
text	Single-line text field.	<input id="uname" maxlength="20" name="username" placeholder="Enter username" required="" type="text"/>
password	Hides typed characters (for passwords).	<input id="pwd" minlength="6" name="pwd" placeholder="Enter password" required="" type="password"/>
email	Input for email addresses (validates format).	<input id="email" name="email" placeholder="name@example.com" required="" type="email"/>
number	Numeric input with min/max/step controls.	<input id="age" max="100" min="1" name="age" step="1" type="number" value="18"/>
tel	Telephone number input (may show number pad on mobile).	<input id="phone" name="phone" placeholder="1234567890" type="tel"/>
checkbox	Allows selecting one or more options.	<input checked="" name="hobby" type="checkbox" value="music"/> Music <input name="hobby" type="checkbox" value="sports"/> Sports
radio	Allows selecting one option from a group.	<input checked="" name="gender" type="radio" value="male"/> Male <input name="gender" type="radio" value="female"/> Female
submit	Button to submit the form.	<input type="submit" value="Submit Form"/>
reset	Button to reset all form fields.	<input type="reset" value="Reset Form"/>
button	General button (custom actions via JavaScript).	<input type="button" value="Click Me"/>
file	Allows file selection/upload.	<input accept=".pdf,.doc" id="resume" multiple="" name="resume" type="file"/>

hidden	Hidden input (not shown to user, but submitted).	<input name="userid" type="hidden" value="12345"/>
date	Date picker (calendar).	<input id="dob" max="2025-12-31" min="2000-01-01" name="dob" type="date" value="2020-05-15"/>
range	Slider control for selecting a numeric value.	<input id="vol" max="50" min="0" name="vol" step="5" type="range" value="25"/>
color	Color picker input.	<input id="favcolor" name="favcolor" type="color" value="#ff0000"/>

GET Method:

- Appends the form data to the URL, in name/value pairs
- NEVER use GET to send sensitive data! (the submitted form data is visible in the URL!)
- The length of a URL is limited (2048 characters)
- Useful for form submissions where a user wants to bookmark the result
- GET is good for non-secure data, like query strings in Google

POST Method:

- Appends the form data inside the body of the HTTP request (the submitted form data is not shown in the URL)
- POST has no size limitations, and can be used to send large amounts of data.
- Form submissions with POST cannot be bookmarked align: It aligns form in left or right or center.

❖ HTML <select> tag

- ✓ <select> tag is used to create a drop-down list with multiple options. The <option> element is nested within <select> tag for defining options in a list.
- ✓ The <select> element is used to create a drop-down list. The <select> element is most often used in a form, to collect user input.
- ✓ The <optgroup> tag is used to group related options in a <select> element (drop-down list). If you have a long list of options, groups of related options are easier to handle for a user.
- ✓ The <option> tag defines an option in a select list.

Attributes

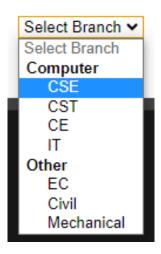
- disabled: Specifies that an option should be disabled
- **selected:** Specifies that an option should be pre-selected when the page loads.
- **hidden:** The option with the hidden attribute is not visible in the dropdown list, but it remains in the HTML code, and its value can still be accessed programmatically (e.g., through JavaScript).
- Value: Specifies the value to be sent to a server

Optgroup and selected, hidden, disabled example

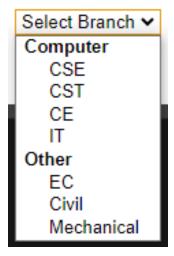
```
<select name="degree_branch">
    <option value="select" selected disabled> Select
Branch</option>
    <option value="Computer">
        <option value="cse"> CSE </option>
        <option value="cst"> CST </option>
        <option value="c"> CE </option>
        <option value="it"> IT </option>
        <option value="it"> EC </option>
        <option value="Other">
              <option value="ec"> EC </option>
              <option value="c"> EC </option>
              <option value="civil"> Civil </option>
              <option value="Mech"> Mechanical </option>
        </optgroup>
        </select>
```

Selected attribute keeps the option selected at first time we load the web page.

```
<select name="degree_branch">
    <option value="select" selected hidden> Select
Branch</option>
    <option value="Computer">
        <option value="cse"> CSE </option>
        <option value="cst"> CST </option>
        <option value="ce"> CE </option>
        <option value="it"> IT </option>
        <option value="it"> EC </option>
        <option value="co"> EC </option>
        <option value="ec"> EC </option>
        <option value="ec"> EC </option>
        <option value="civil"> Civil </option>
        <option value="Mech"> Mechanical </option>
        </optgroup>
    </select>
```



Disabled attribute disables the option. We cannot select the disabled option.



Hidden attribute hides the option.

readonly, disabled and hidden

1. readonly

- Behavior: The field is visible and its value can be submitted with the form, but the user cannot
 edit it.
- Use case: Showing a value that should not be changed but still sent to the server.

2. disabled

- Behavior: The field is visible but grayed out, cannot be edited, and is not submitted with the form.
- **Use case:** Temporarily disabling a field based on a condition.

3. hidden

- Behavior: The field is not visible at all on the page, but its value is submitted with the form.
- Use case: Passing extra data to the server without showing it to the user (like user ID).

Example

```
<h2>Form Example: readonly, disabled, hidden</h2>
<form action="#" method="get">
  <!-- Readonly field -->
  <label>Username (readonly):</label>
  <input type="text" name="username" value="LJU" readonly>
  <br><br>>
  <!-- Disabled field -->
  <label>Promo Code (disabled):</label>
  <input type="text" name="promo" value="SUMMER50" disabled>
  <br><br>>
  <!-- Hidden field -->
  <input type="hidden" name="userId" value="12345">
  <!-- Editable field -->
  <label>Email:</label>
  <input type="email" name="email" placeholder="Enter your email" required>
  <br><br><
  <button type="submit">Submit
</form>
```

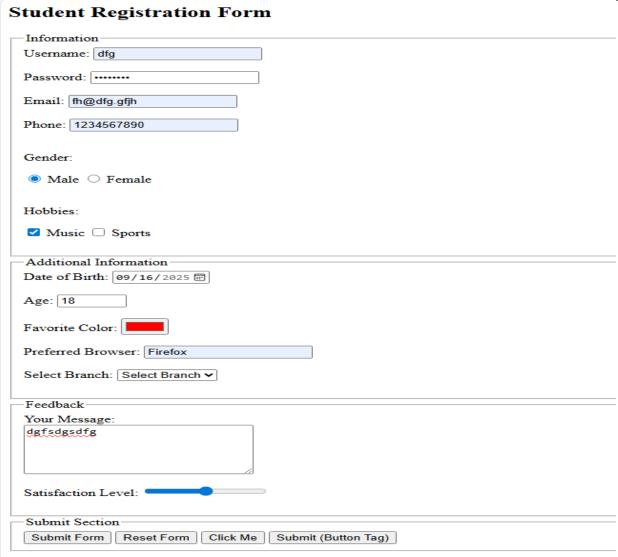
Form Example: readonly, disabled, hidden

Username (readonly): LJU	
Promo Code (disabled): SUMMER50	
Email: Enter your email	
Submit	

```
<h2>Student Registration Form</h2>
<form action="submit.html" method="get">
  <!-- Personal Information -->
  <fieldset>
    <legend>Information</legend>
    <label for="uname">Username:</label>
    <input type="text" name="username" id="uname" autofocus autocomplete="on"
<label for="pwd">Password:</label>
    <input type="password" name="pwd" id="pwd" placeholder="Enter password" required
minlength="6"><br><br>
    <a href="mail">Email:</a>
    <input type="email" name="email" id="email" placeholder="name@example.com"</pre>
required><br><br>
    <label for="phone">Phone:</label>
    <input type="tel" name="phone" id="phone" placeholder="1234567890"><br>
    Gender:
    <input type="radio" name="gender" value="male" checked> Male
    <input type="radio" name="gender" value="female"> Female <br><br>
    Hobbies:
    <input type="checkbox" name="hobby" value="music" checked> Music
    <input type="checkbox" name="hobby" value="sports"> Sports <br><br>
  </fieldset>
  <!-- Preferences -->
  <fieldset>
    <legend>Additional Information</legend>
    <label for="dob">Date of Birth:</label>
    <input type="date" name="dob" id="dob" min="2025-09-07" max="2025-12-31"><br><br>
    <a href="label">Age:</a></abel>
    <input type="number" name="age" id="age" min="1" max="100" step="1" value="18"><br>
    <label for="favcolor">Favorite Color:</label>
```

```
<input type="color" name="favcolor" id="favcolor" value="#ff0000"><br>
            <a href="label"><a href="label
            <input list="browsers" name="browser" id="browser">
            <datalist id="browsers">
                  <option value="Chrome">
                  <option value="Firefox">
                  <option value="Edge">
            </datalist><br><br>
            <a href="degree">Select Branch:</a></abel>
            <select name="degree branch" id="degree">
                  <option value="select" selected disabled>Select Branch
                  <optgroup label="Computer">
                        <option value="cse">CSE</option>
                        <option value="cst">CST</option>
                       <option value="ce">CE</option>
                        <option value="it">IT</option>
                  </optgroup>
                  <optgroup label="Other">
                        <option value="ec">EC</option>
                       <option value="civil">Civil</option>
                        <option value="mech">Mechanical
                  </optgroup>
            </select><br><br>
      </fieldset>
      <fieldset>
            <legend>Feedback</legend>
            <label for="msg">Your Message:</label><br>
            <textarea name="message" id="msg" rows="5" cols="30">Enter your
message</textarea><br><br>
            <label for="range">Satisfaction Level:</label>
            <input type="range" name="satisfaction" id="range" min="0" max="50" step="5"</pre>
value="25"><br><br>
             <!-- Hidden value -->
            <input type="hidden" name="userid" value="12345">
      </fieldset>
      <!-- Form Buttons -->
      <fieldset>
            <legend>Submit Section</legend>
            <input type="submit" value="Submit Form">
```

<input type="reset" value="Reset Form">
 <input type="button" value="Click Me">
 <button type="submit">Submit (Button Tag)</button>
 </fieldset>
</form>



autofocus and autocomplete='on' added as attributes

Student Registration Form



Design an HTML form that allows users to **upload one or more files** to a server. The form should:

- 1. Include a file input field where the user can browse and select files.
- 2. Restrict the file types to only **PDF** (.pdf) and **Word Document** (.doc) formats.
- 3. Allow users to select multiple files at once.
- 4. Group the file input inside a **fieldset** for better structure.
- 5. Provide two buttons:
 - \circ **Submit** \rightarrow to send the selected file(s) to the server.
 - Reset → to clear the form and allow new input.
- 6. Use the **POST** method with enctype="multipart/form-data" so the files are correctly transferred in the request body.

File Upload



- The accept attribute is a hint to the browser about what file types should be selectable.
- <input type="file" accept=".pdf,.doc"> This tells the browser's file picker: only show PDF and Word files as selectable.
- The file dialog (file chooser window) will **filter** and only show .pdf and .doc files by default.
- But in many browsers, the user can still change the filter (e.g., "All Files .") and pick any file type (like .png, .exe).
- So accept is not strict validation. It's a UI convenience.

SVG - Scalable Vector Graphics

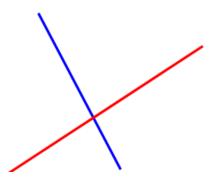
- SVG stands for Scalable Vector Graphics
- SVG is used to define vector-based graphics for the Web
- SVG defines the graphics in XML format
- Every element and every attribute in SVG files can be animated

SVG Advantages

Advantages of using SVG over other image formats (like JPEG and GIF) are:

- SVG images can be created and edited with any text editor
- SVG images can be searched, indexed, scripted, and compressed
- SVG images are scalable
- SVG images can be printed with high quality at any resolution
- SVG images are zoomable
- SVG graphics do NOT lose any quality if they are zoomed or resized
- SVG is an open standard
- SVG files are pure XML

1. SVG Line - <line>



Code explanation:

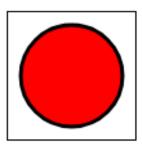
- The x1 attribute defines the start of the line on the x-axis
- The y1 attribute defines the start of the line on the y-axis
- The x2 attribute defines the end of the line on the x-axis
- The y2 attribute defines the end of the line on the y-axis
- The stroke-width attribute defines the width of the border of the line
- The stroke attribute defines the color of the border of the line.

The stroke attribute must be set to a color (e.g., black, red, #000000) for the shape's outline to appear. The **default stroke** is not applied automatically, and an unspecified stroke means no visible stroke at all

Default value is not white. But we need to define a stroke attribute for the shape's outline to appear.

2. SVG Circle

```
<svg height="100" width="100" style="border:1px solid black">
    <circle cx="50" cy="50" r="40" stroke="black" stroke-width="3" fill="red" />
    </svg>
```



Code explanation:

- The cx and cy attributes define the x and y coordinates of the center of the circle. If cx and cy are omitted, the circle's center is set to (0,0)
- The r attribute defines the radius of the circle.
- The fill attribute defines the fill color of the circle.
- The stroke-width attribute defines the width of the border of the circle.
- The stroke attribute defines the color of the border of the circle.

3. SVG Rectangle - <rect>

The <rect> element is used to create a rectangle and variations of a rectangle shape:

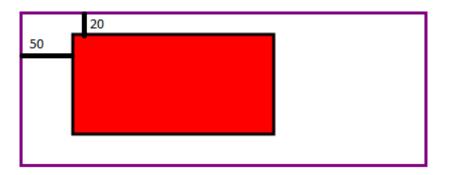
```
<svg width="400" height="120" style="border:3px solid purple">
  <rect width="300" height="100" stroke="black" stroke-width="3" fill="red" />
  </svg>
```



In above example by default x and y coordinates are (0, 0)

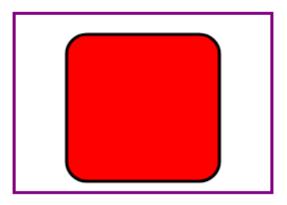
- The width and height attributes of the <rect> element define the height and the width of the rectangle
- The fill attribute defines the fill color of the rectangle.
- The stroke-width attribute defines the width of the border of the rectangle.
- The stroke attribute defines the color of the border of the rectangle.

```
<svg width="400" height="150" style="border:3px solid purple">
  <rect x="50" y="20" width="200" height="100" stroke="black" stroke-width="3" fill="red" />
  </svg>
```



- The x attribute defines the left position of the rectangle (e.g. x="50" places the rectangle 50 px from the left margin)
- The y attribute defines the top position of the rectangle (e.g. y="20" places the rectangle 20 px from the top margin)

```
<svg width="250" height="180" style="border:3px solid purple">
  <rect x="50" y="20" rx="20" ry="20" width="150" height="150" stroke="black" stroke-
width="3" fill="red"/>
  </svg>
```



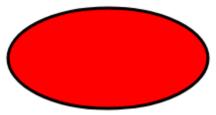
• The rx and the ry attributes rounds the corners of the rectangle

4. SVG Ellipse - <ellipse>

The <ellipse> element is used to create an ellipse.

An ellipse is closely related to a circle. The difference is that an ellipse has an x and a y radius that differs from each other, while a circle has equal x and y radius:

```
<svg height="140" width="500">
  <ellipse cx="200" cy="80" rx="100" ry="50"
  stroke="black" stroke-width="3" fill="red"/>
  </svg>
```



Code explanation:

- The cx attribute defines the x coordinate of the center of the ellipse
- The cy attribute defines the y coordinate of the center of the ellipse
- The rx attribute defines the horizontal radius
- The ry attribute defines the vertical radius.
- The fill attribute defines the fill color of the ellipse.
- The stroke-width attribute defines the width of the border of the ellipse.
- The stroke attribute defines the color of the border of the ellipse.

5. Logo

```
<svg height="140" width="500">
    <ellipse cx="200" cy="80" rx="100" ry="50" stroke="black" stroke-width="3" fill="pink"/>
    <text fill="#000" font-size="50" x="155" y="100" font-family="verdana">LJU</text>
</svg>
```



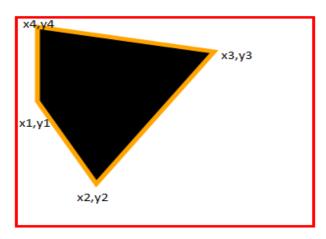
6. SVG Polygon - <polygon>

The <polygon> element is used to create a graphic that contains at least three sides.

Polygons are made of straight lines, and the shape is "closed" (all the lines connect up).

<polygon points="x1,y1,x2,y2,x3,y3,x4,y4....xn,yn" stroke="color" stroke-width="5" fill="black" />

<svg height="250" width="300" style="border: 3px solid red;">
<polygon points="20,100,80,200,200,40,20,10" stroke="orange" stroke-width="5" fill="black" />
</svg>

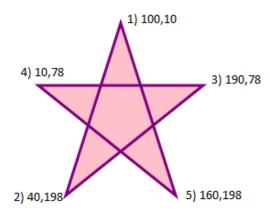


Code explanation:

- The points attribute defines the x and y coordinates for each corner of the polygon
- The fill attribute defines the fill color of the polygon.
- The stroke-width attribute defines the width of the border of the polygon.
- The stroke attribute defines the color of the border of the polygon.

Use the <polygon> element to create a Star:

```
<svg height="210" width="500">
    <polygon points="100,10,40,198,190,78 10,78,160,198"
    stroke="purple" stroke-width="3" fill="pink" fill-rule="nonzero" />
    </svg>
```



- ✓ The **fill-rule** attribute is a presentation attribute defining the algorithm to use to determine the *inside* part of a shape.
- ✓ After counting the crossings paths, if the result is zero then the point is outside the path. Otherwise, it is inside. **Default value is "nonzero"**

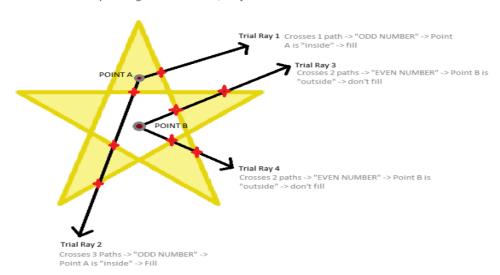
Change the fill-rule property to "evenodd":

```
<svg height="210" width="500">
    <polygon points="100,10,40,198,190,78 10,78,160,198"
    stroke="purple" stroke-width="3" fill="pink" fill-rule="evenodd" />
    </svg>
```



This is how the mechanism works. Pick a point in the center, draw lines to infinity in any direction - they always cross an even number of path segments -which means that they are "outside" and their areas don't get filled.

Pick a point in the filled triangles - if you draw lines to infinity in any direction - they always cross an odd number of path segments and thus, they are "inside" and their area should be filled.



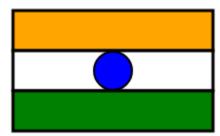
Note:

- ✓ If the fill attribute is not specified, then default value is black.
- ✓ stroke attribute is necessary to define in line tag, otherwise line will not be visible.
- ✓ In other tags like rect, circle, polygon, ellipse etc it will fill the shape with default color black/mentioned color without stroke (border of the shape).

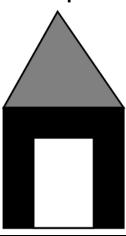
SVG shapes like <circle>, <rect>, etc do not render a stroke unless a stroke color is explicitly provided. There is no default stroke automatically applied unless specified.

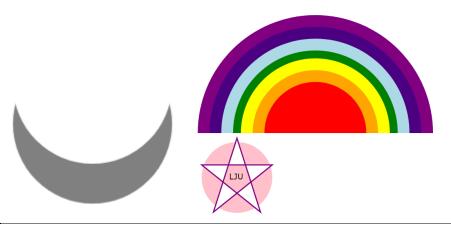
Without the stroke attribute, the circle won't render any visible outline because no stroke color is applied. To make the circle visible, you need to explicitly define the stroke color.

Default value is not white. But we need to define a stroke attribute for the shape's outline to appear.



Example 2





```
<!--moon -- >
```

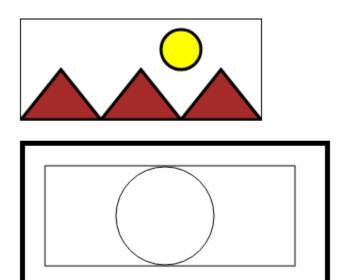
```
<svg width="200" height="200">
     <circle cx="120" cy="100" r="80" fill="grey"/>
     <circle cx="120" cy="60" r="80" fill="white"/>
</svg>
```

<!--rainbow half circle -- >

```
<svg width="600" height="500">
        <circle cx="300" cy="500" r="300" fill="purple"/>
        <circle cx="300" cy="500" r="270" fill="indigo"/>
        <circle cx="300" cy="500" r="240" fill="lightblue"/>
        <circle cx="300" cy="500" r="210" fill="green"/>
        <circle cx="300" cy="500" r="190" fill="yellow"/>
        <circle cx="300" cy="500" r="160" fill="orange"/>
        <circle cx="300" cy="500" r="130" fill="red"/>
        </svg>
```

<!--star circle logo -->

```
<svg height="400" width="500">
        <circle cx="100" cy="110" r="90" fill="pink"></circle>
        <polygon points="100,10,40,198,190,78 10,78,160,198"
        stroke="purple" stroke-width="3" fill="white" fill-rule="evenodd" />
        <text fill="#000" font-size="20" x="80" y="115" font-family="verdana">LJU</text>
</svg>
```



HTML Image Map

<area> and <map>

- The <area> tag defines an area inside an image map (an image map is an image with clickable areas).
- <area> elements are always nested inside a <map> tag.

Note: The usemap attribute in is associated with the <map> element's name attribute, and creates a relationship between the image and the map.

Attributes:

- **shape**: The shape to be mapped on the image, can be a "rect", a "circle" or a "poly".
- **coords**: The coordinates of the shape.
- **href**: The href is the link where the user will be directed to after clicking the mapped portion of the image.
- alt: Alternative text for a clickable area in an image map.
- target: Context in which to open the link resource.

x1,y1,x2,y2	Specifies the coordinates of the top-left and bottom-right corner of the rectangle (shape="rect")
x,y,radius	Specifies the coordinates of the circle center and the radius (shape="circle")
x1,y1,x2,y2,,xn,yn	Specifies the coordinates of the edges of the polygon. If the first and last coordinate pairs are not the same, the browser will add the last coordinate pair to close the polygon (shape="poly")

Example:

```
<html>
    <head> <title>Area & Map</title> </head>
    <body>
        <h1> Map & Area </h1>
    <!-- Image Map Generated by http://www.image-map.net/ -->
    <img src="test.jpg" usemap="#image-map">
```



To find coordinates reference website: https://www.image-map.net/

SVG, Forms, and Image Maps are all important topics in terms of descriptive questions.