

# TOPICS, QUIZZES & EXPERIMENTS

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*Foundations of Web Front-end*

# TOPICS

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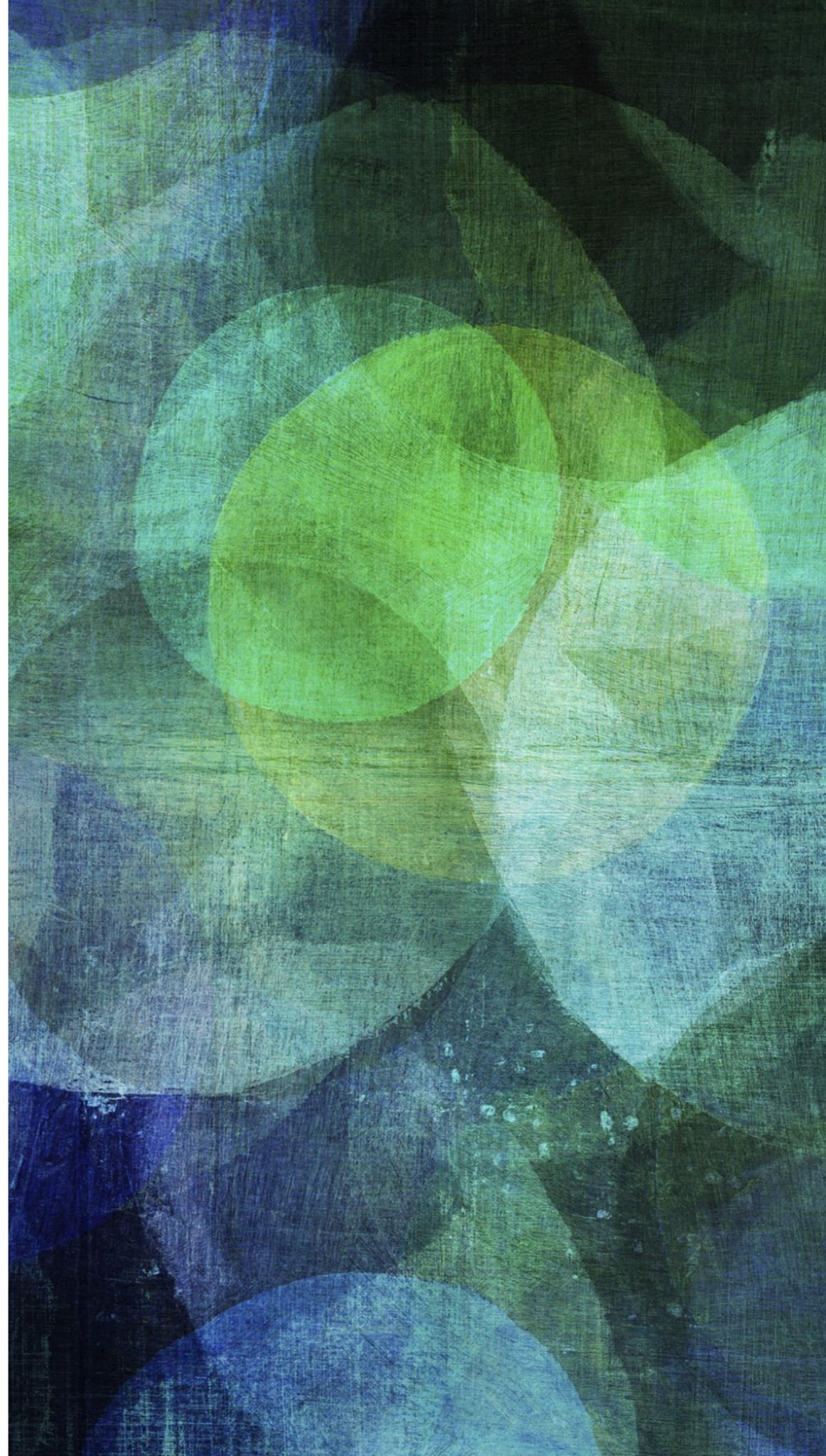
- Getting Started ~1 hour
- HTML ~3 modules
- CSS ~3 modules
- JavaScript ~2.5 modules
- jQuery ~ 1.5 modules
- Bootstrap ~ 1.5 module
- Angular ~3 modules
- Knockout ~1 module
- Total = 16 modules

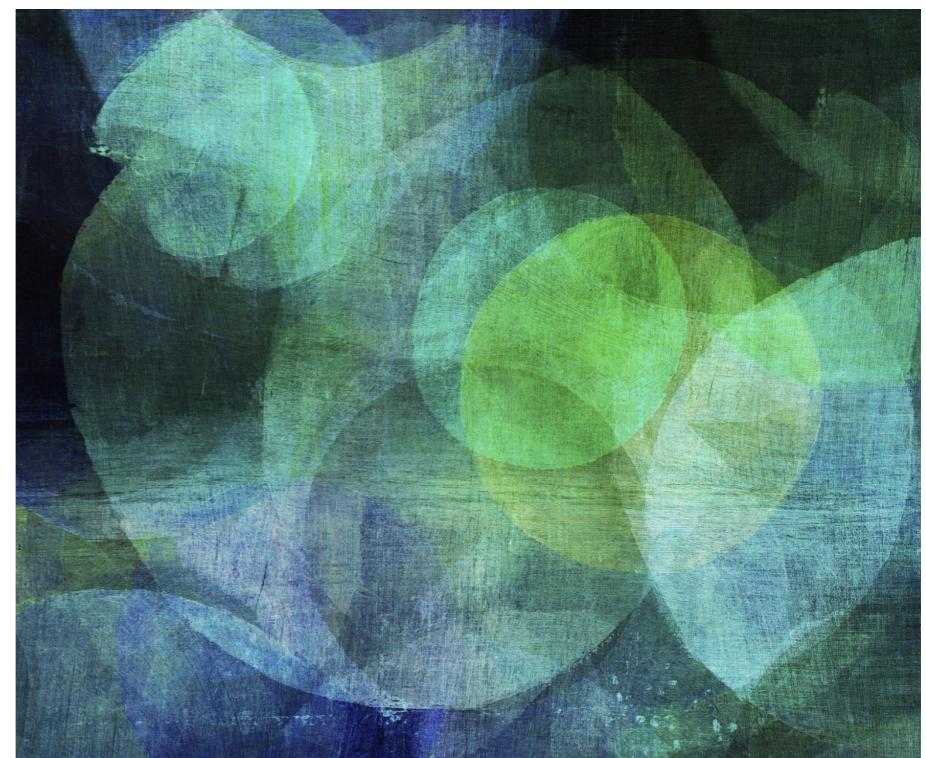
**Note: 1 module = 4 hours**

# GETTING STARTED

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*The www and web  
applications*



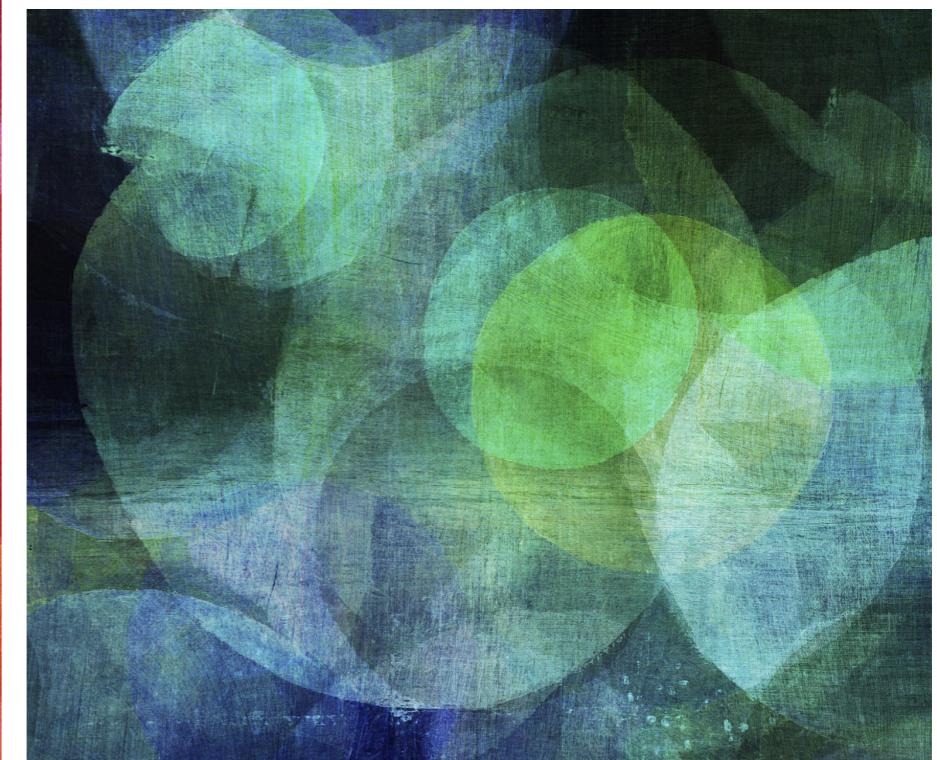
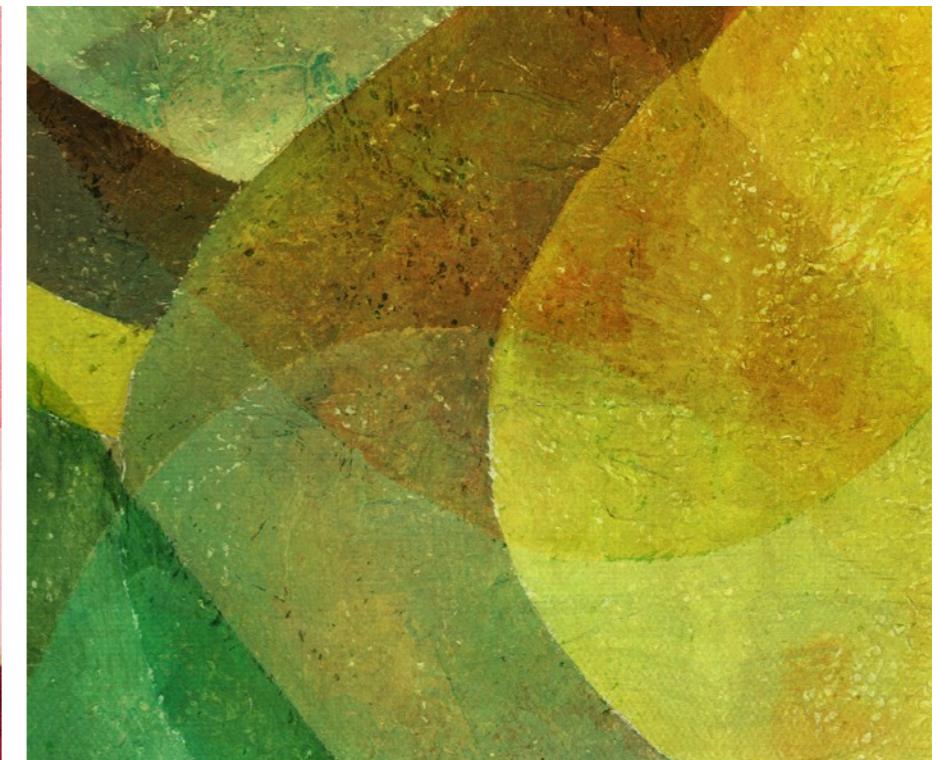
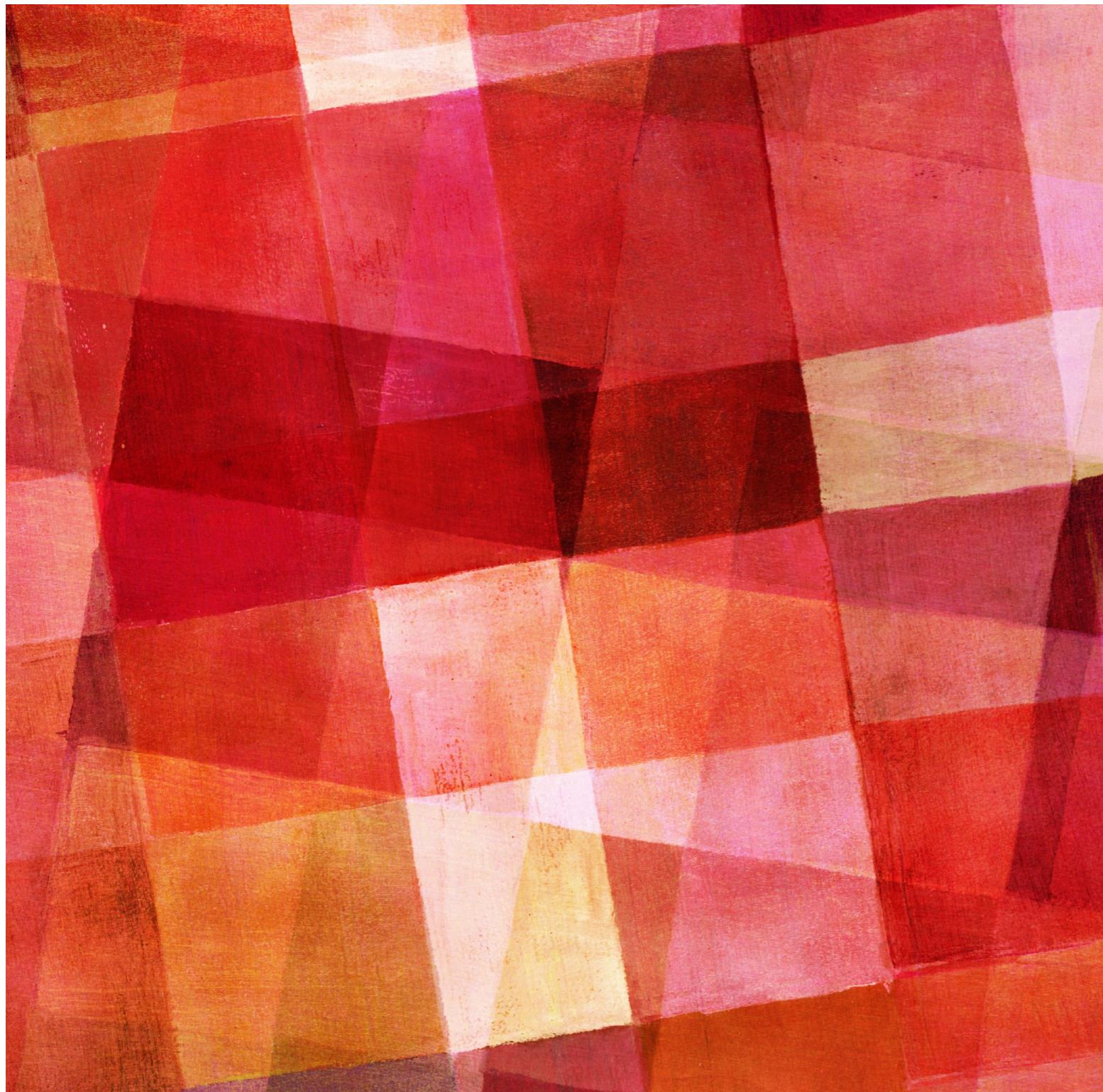


*Setup - Tools required*

# SETUP - TOOLS REQUIRED

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- Browser - preferably Chrome
- Integrated Development Environment (IDE) - preferably VSCode
- <https://code.visualstudio.com/>



*History of the Web*

# HISTORY OF THE WEB

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- World Wide Web (www) - what is it?
- History
- Components that make www happen
  - Internet
  - Web server
  - Client (browser)
  - URL
  - HTML, CSS, JS (last 2 came later)
  - HyperText Transfer Protocol (HTTP)



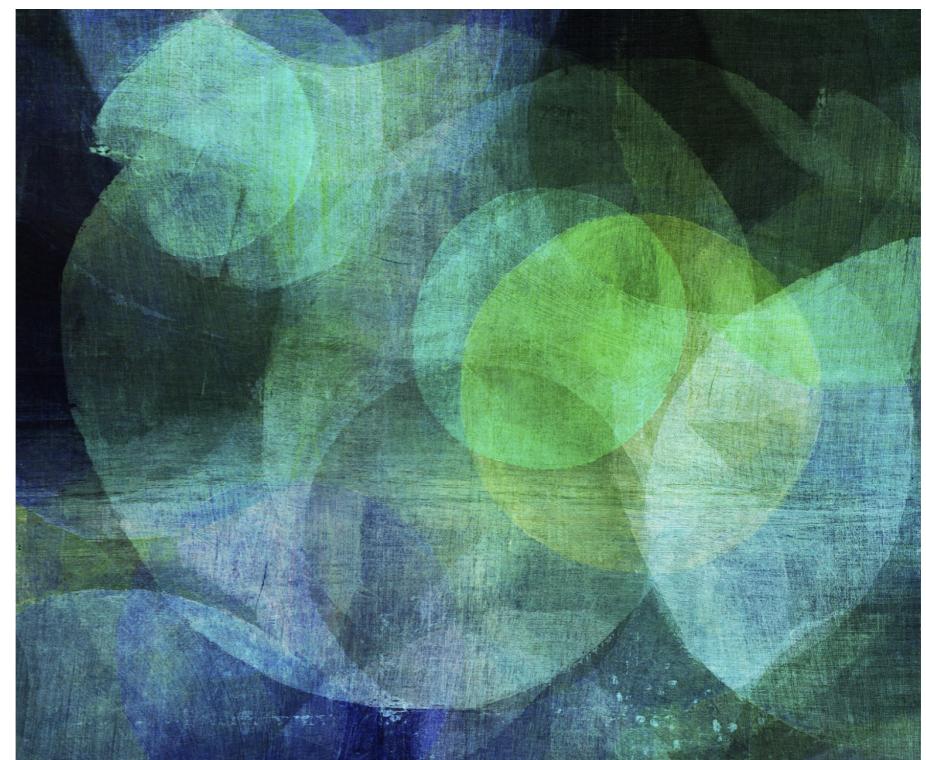
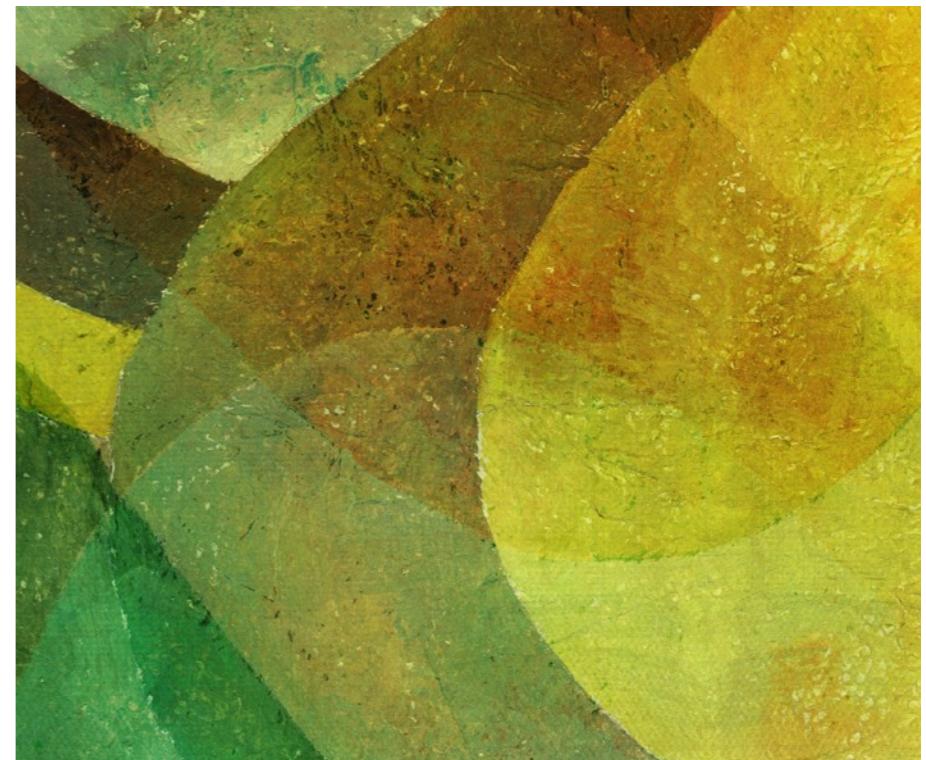
*Quiz*

*History of the Web*

# HISTORY OF THE WEB

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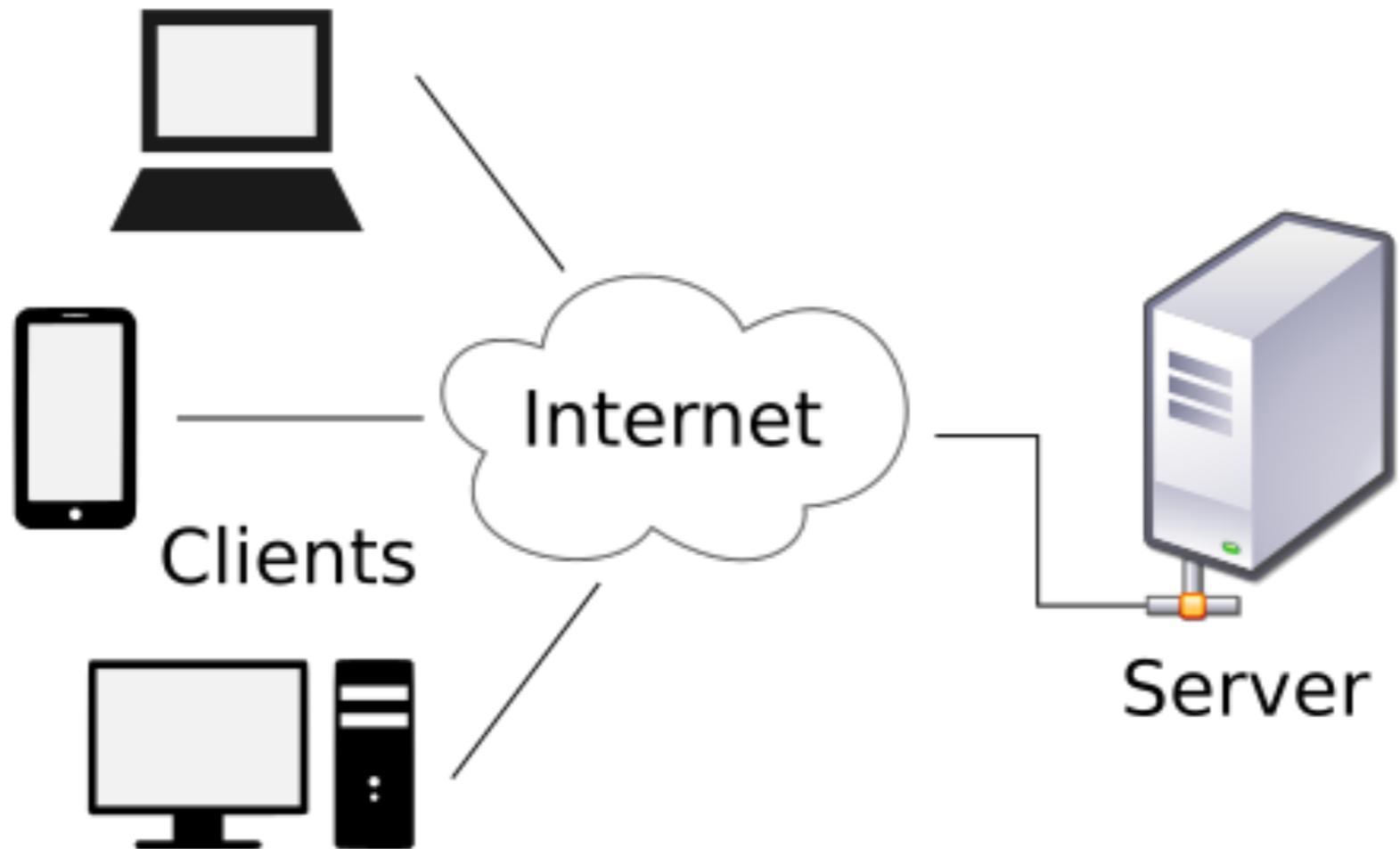
- Which year did the World Wide Web (www) begin?
- What tools and technologies were part of www when it began?  
What part does each play?
- Name 2 protocols used by browsers to communicate with server.
- What protocol is used by the browser when opening files that lie on your local system?



# Client-Server Architecture

# CLIENT-SERVER ARCHITECTURE

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Client-Server Architecture

Source: [https://en.wikipedia.org/wiki/Client%E2%80%93server\\_model#/media/File:Client-server-model.svg](https://en.wikipedia.org/wiki/Client%E2%80%93server_model#/media/File:Client-server-model.svg)



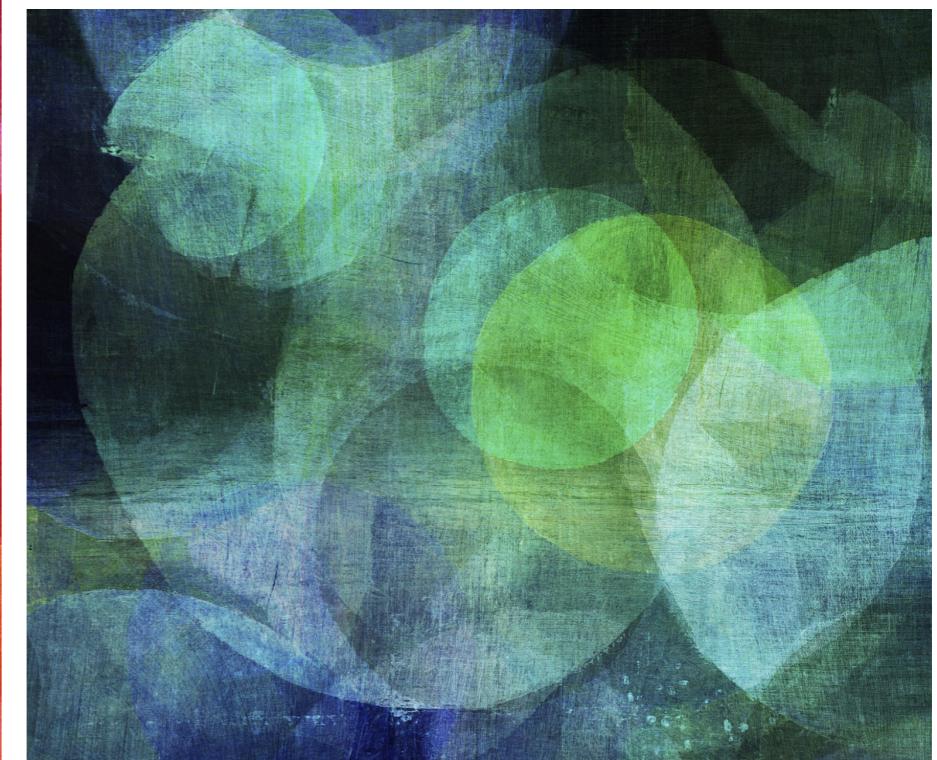
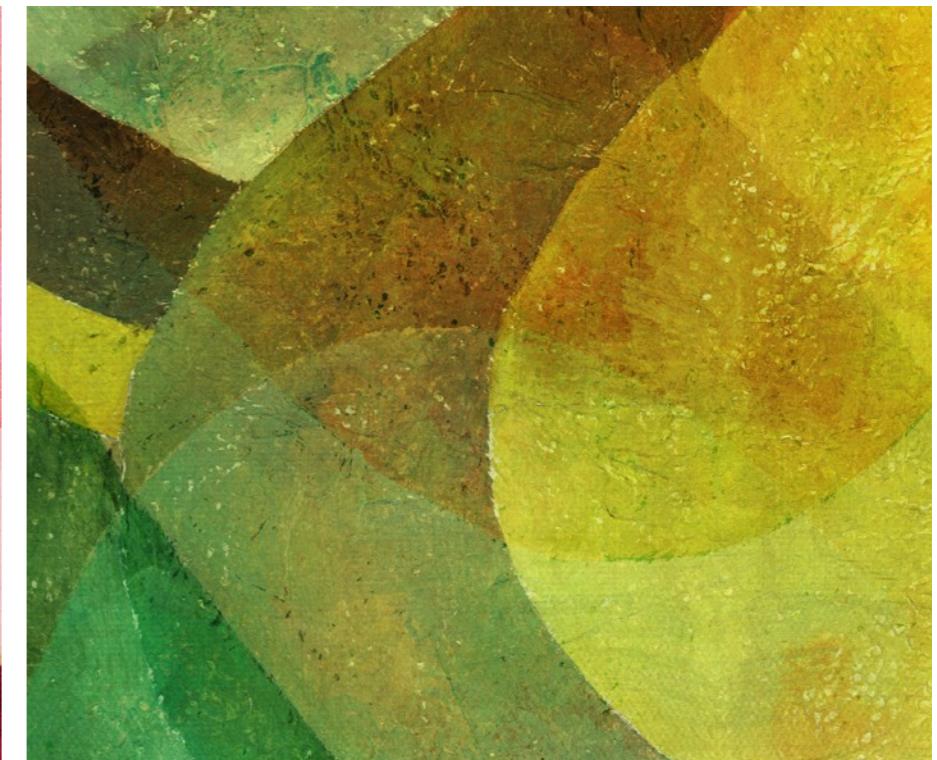
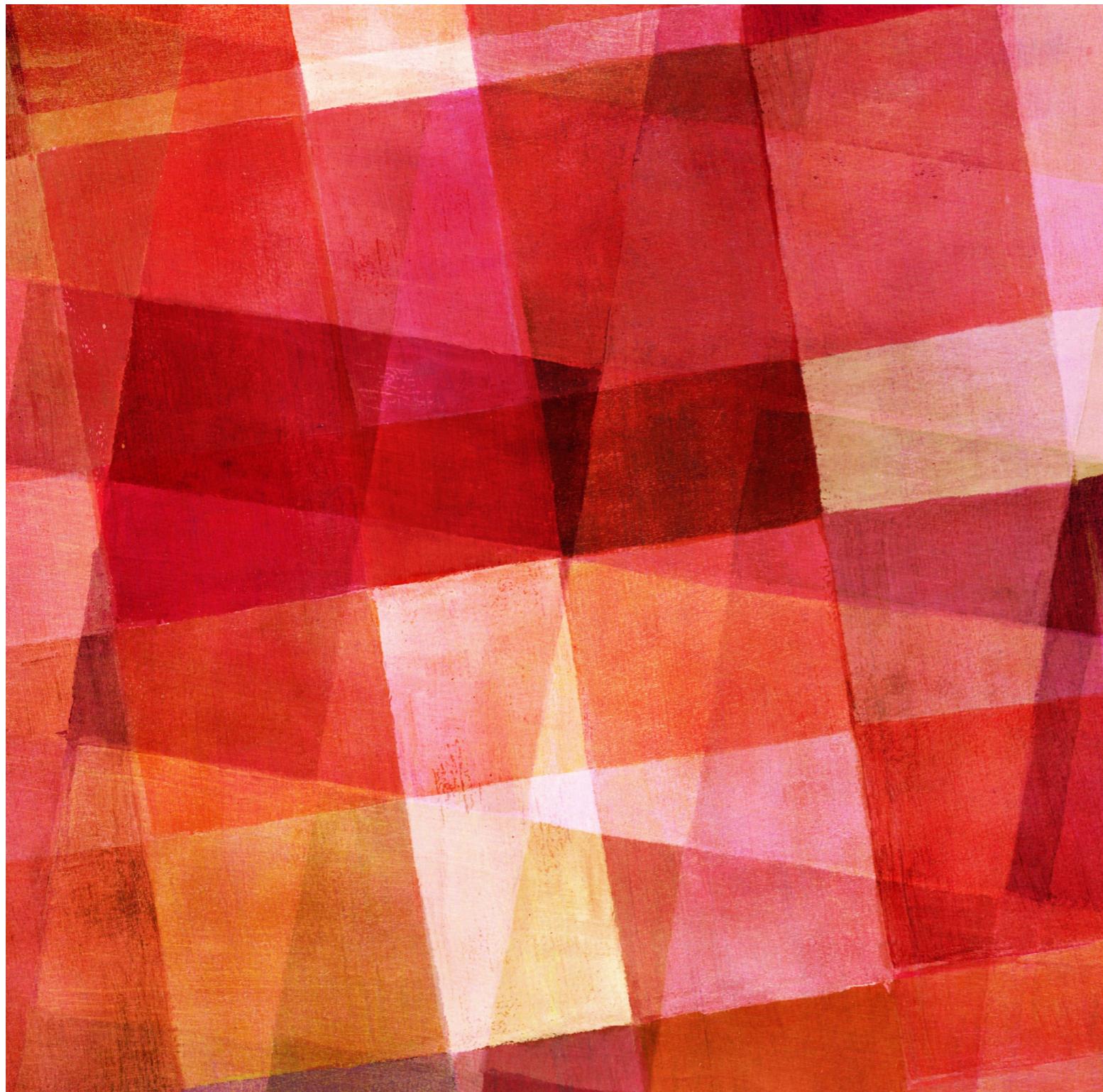
# Quiz

# Client-Server Architecture

# CLIENT-SERVER ARCHITECTURE

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- What do we mean by business logic of an application? Where is it usually implemented in a web application?
- Where do you think these functions of a web application would be carried out?
  - Showing the menu when a button is clicked
  - User authentication (finding if user is a registered user)
  - Retrieving new mails
  - Validating user inputs on a form
- Which protocol should be used for communication between client and server in each case
  - Login username and password is submitted by client to server
  - A public user profile is being viewed
  - Credit card information is being sent from a checkout page on an e-commerce site
  - User's searches for a mobile phone on an e-commerce site



*Anatomy of a URL*

# ANATOMY OF A URL

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- Uniform Resource Locator (URL) uniquely identifies a resource over www
- Parts of a URL

scheme://user:password@host:port/path?query#fragment

- scheme - the protocol - e.g. http
- host (and equivalent IP address) - server identification
- port - path of resource within the server
- query - inputs to the server (key-value pairs)
- fragment - identifies portion of a page
- URL Encoding - Process of encoding disallowed characters in a URL



*Quiz*

*Anatomy of a URL*

# ANATOMY OF A URL

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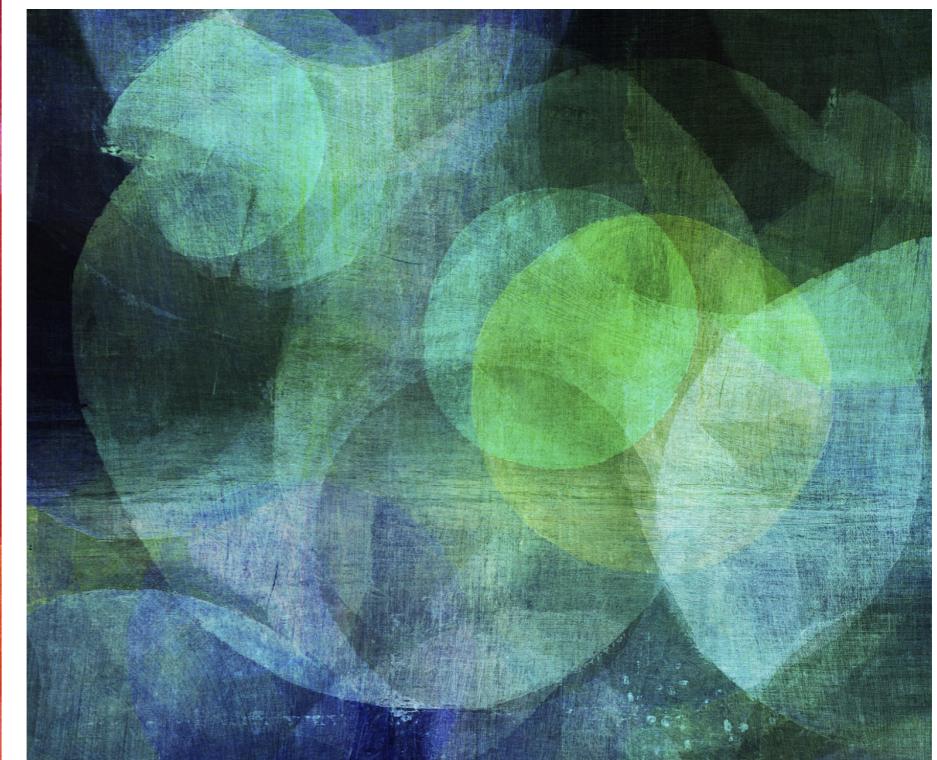
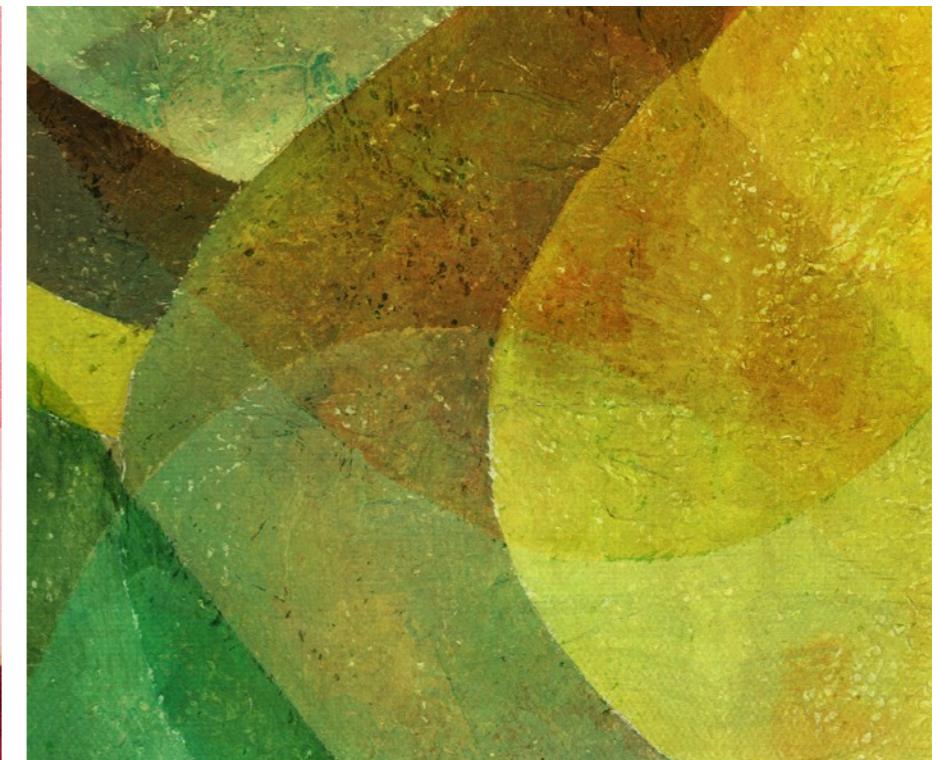
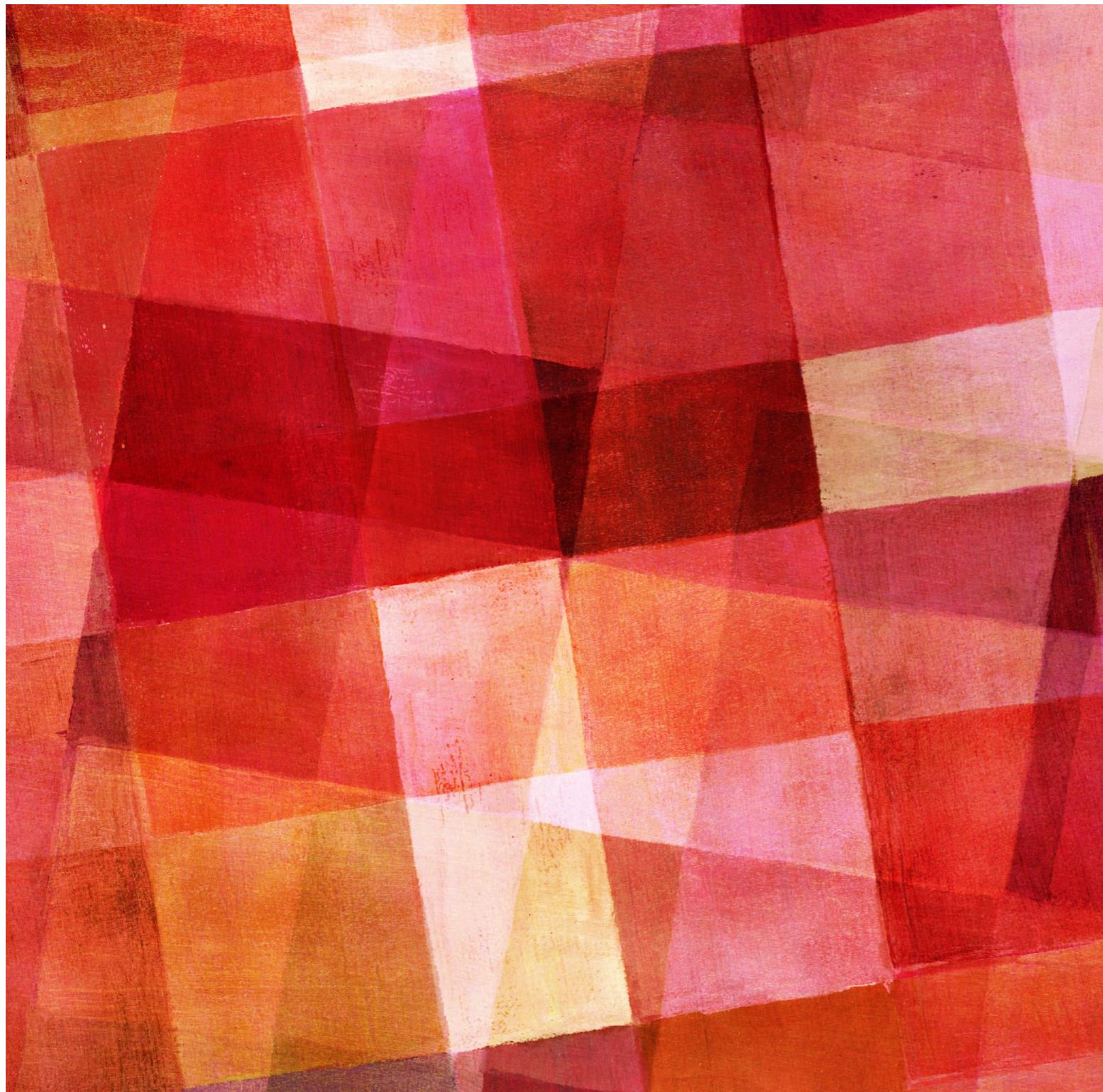
- Identify all the values being sent to the amazon.com server.

`https://www.amazon.com/BLU-R1-HD-Exclusive-Lockscreen/dp/  
B01F9N5QXI/ref=sr_1_1?  
s=wireless&ie=UTF8&qid=1498865680&sr=1-1&keywords=mobile%2Bp  
hone&th=1`

- What is URL encoding? Identify the character introduced during encoding in the above URL.

- What does #Syntax in the following URL signify?

`https://en.wikipedia.org/wiki/URL#Syntax`



# *HTTP Basics*

# HTTP BASICS

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- What is a network protocol?
- Request-response protocols
- HyperText transfer Protocol (HTTP) and HTTPS (HTTP Secure)
- HTTP parts
  - Headers
  - Body
- HTTP verbs (aka methods) - GET, POST, PUT, DELETE
- Accessing details of HTTP request/response in the browser



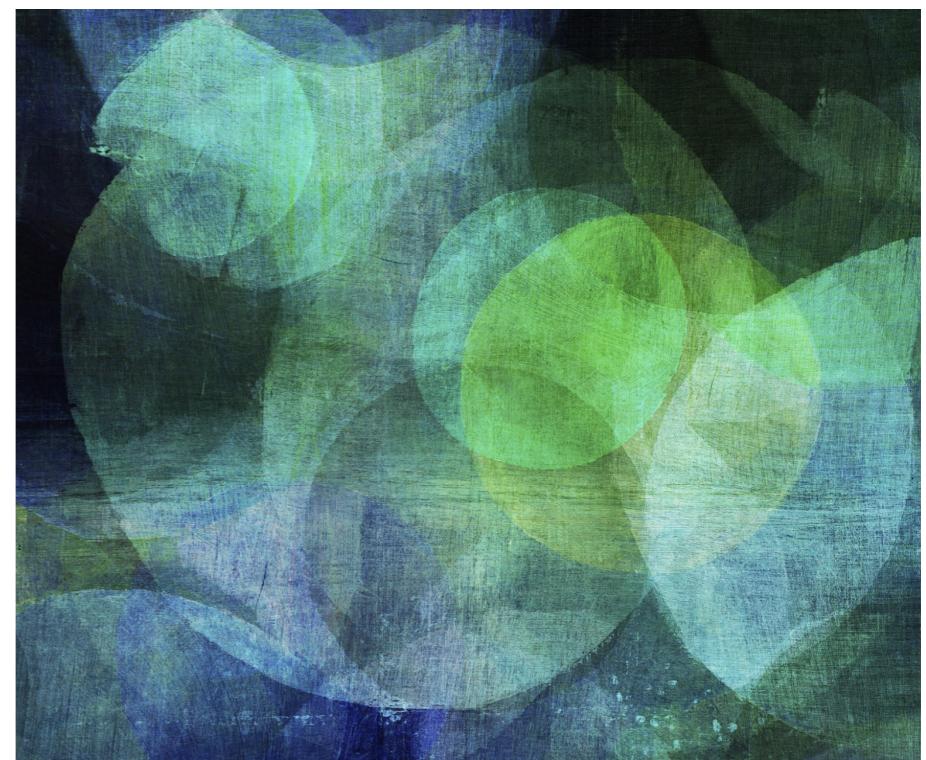
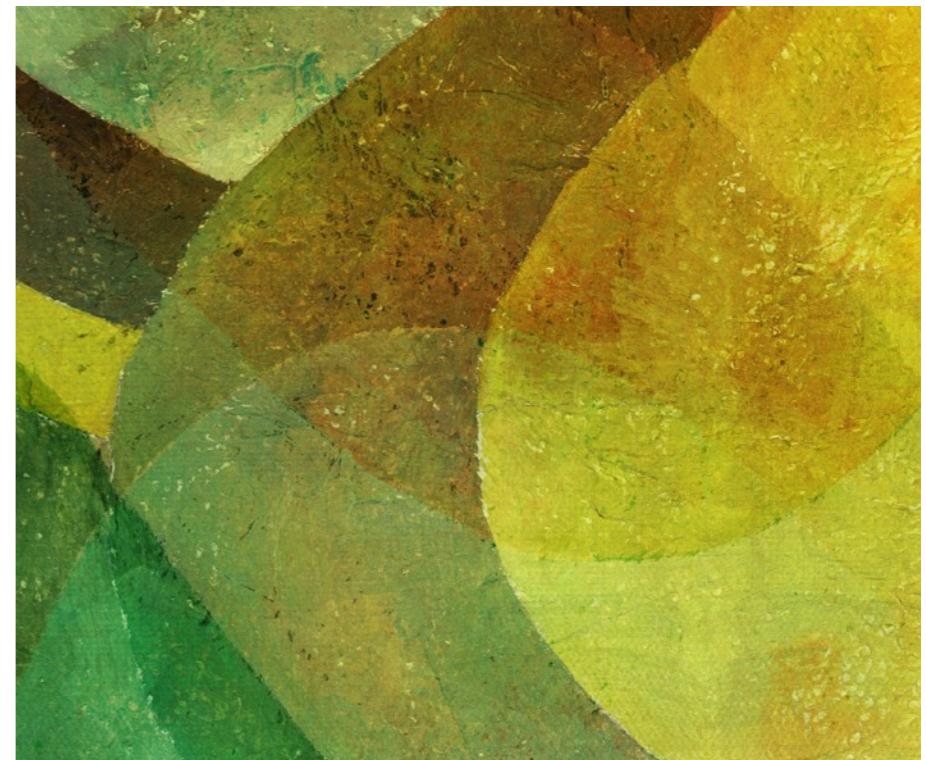
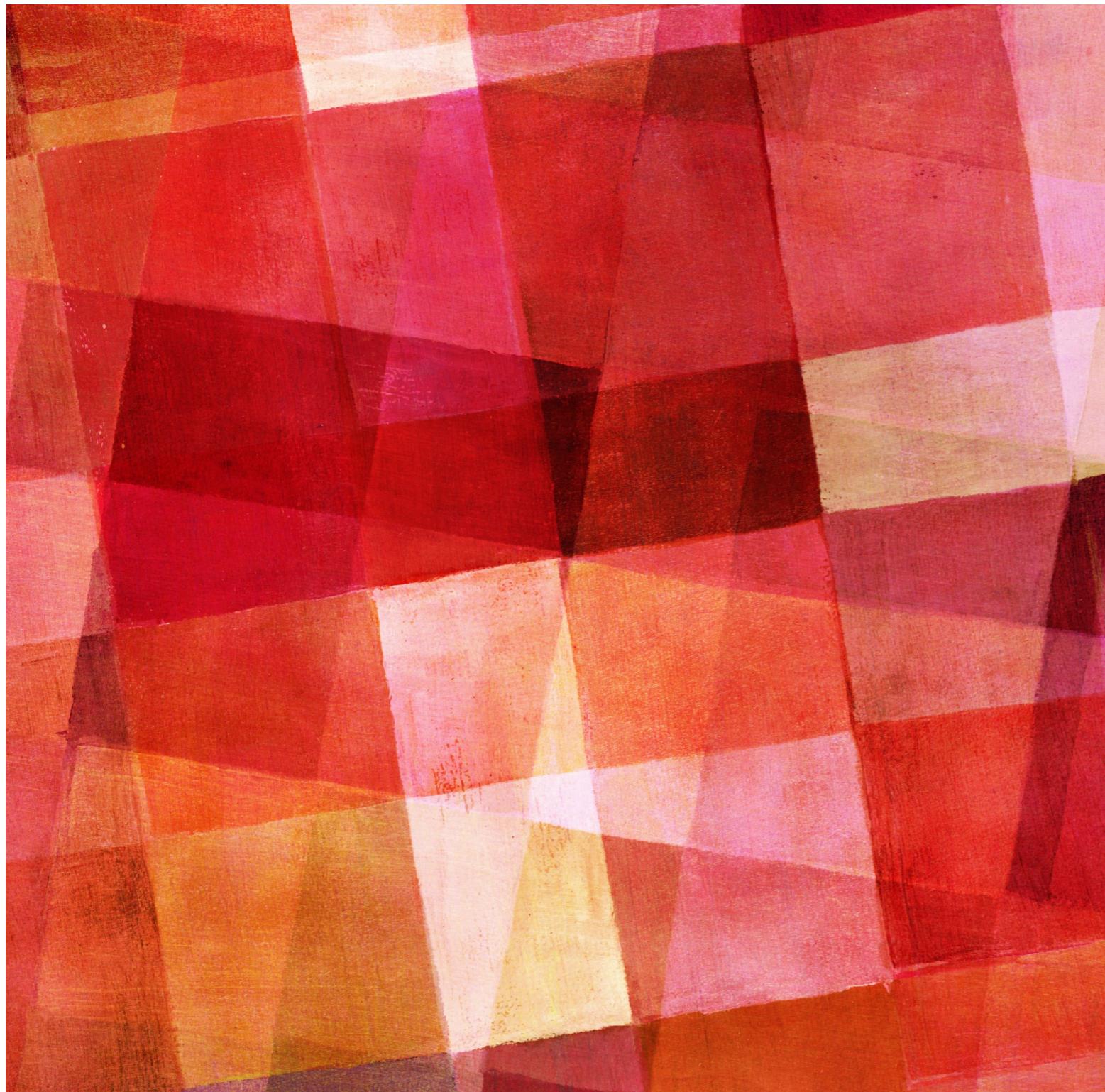
# *Quiz*

# *HTTP Basics*

# HTTP BASICS

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- Who initiates an HHTP request (traditionally) - client or server?
  
- What are the 2 parts of the HTTP message?
  
- What HTTP request method is **most likely** used to
  - Retrieve a web page
  - Get the details of an e-mail from your e-mail provider
  - Submit a leave application on your company's intranet portal
  - Change your profile details in Facebook
  - Remove all mails from your e-mail account's trash folder



*Browser's Developer Tools*

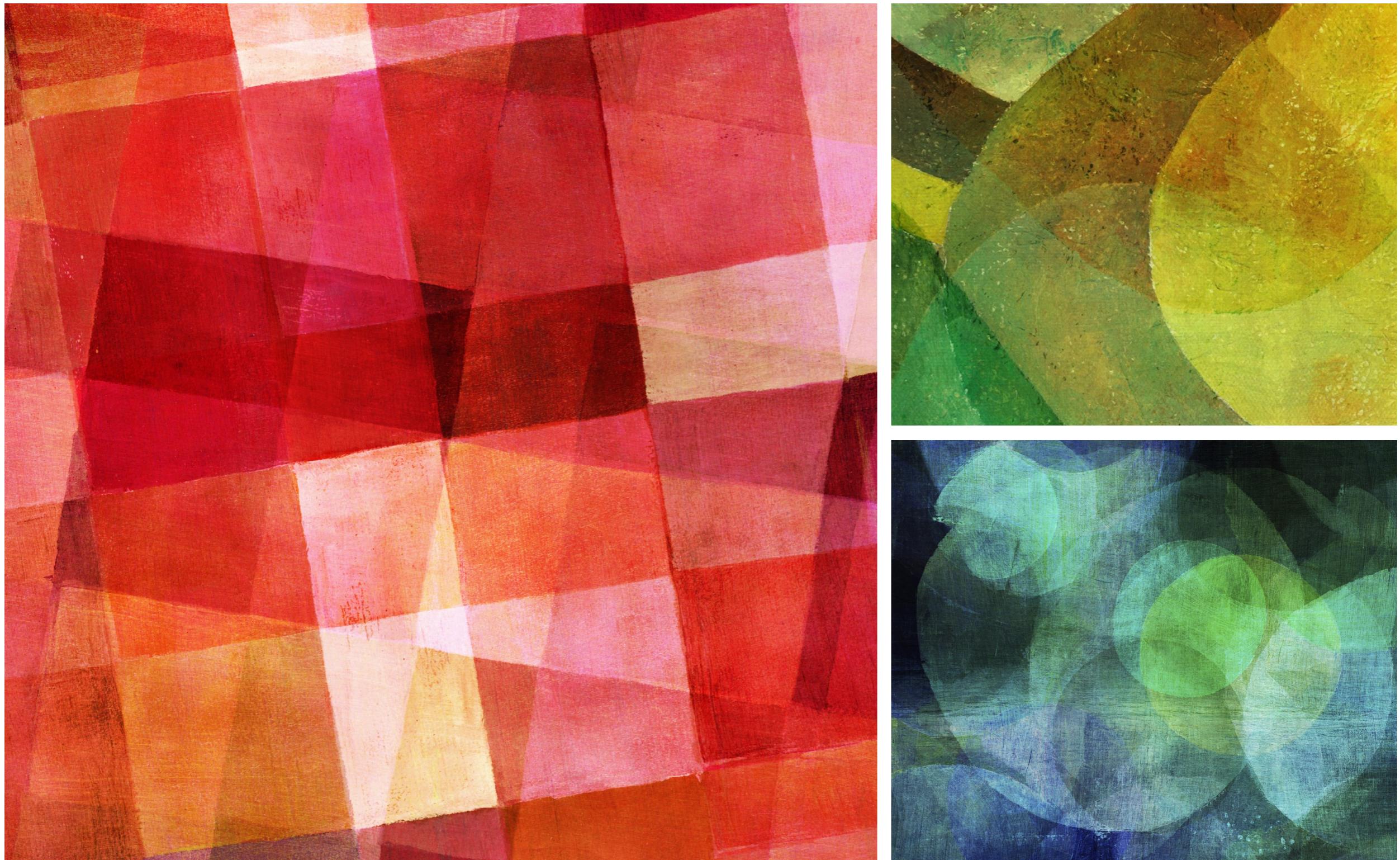
# *Experiment Browser's Developer Tools*



# BROWSER'S DEVELOPER TOOLS

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- Visit [amazon.com](http://amazon.com) home page. Open the developer tools -> Network tab and clear any logged HTTP requests. Refresh the page.
- What is the first HTTP request for? What is the type of the returned resource?
- What are some of the other types of resources fetched from the server?
- Name 2 prominent “methods” used for the HTTP requests. What is the usual response status code?
- How many requests are made? What is the total size of data returned?
- What is the IP address of the [amazon.com](http://amazon.com) server?
- Click on the first request. What is the value of Accept and Accept-Language headers in outgoing request from browser? What is the value of Content-Type and Content-Language in incoming response from server?



# *Introduction to Front-end Technologies*

# INTRODUCTION TO FRONT-END TECHNOLOGIES

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- Content of a page and structuring it - HyperText Markup Language (HTML)
- Layout and styling - Cascading StyleSheets (CSS)
- Handling behaviour of the page and user interactions - JavaScript (JS)
- Versions of HTML, CSS and JS
- Browser-compatibility issues
  - <http://caniuse.com/>



*Quiz*

*Introduction to Front-end  
Technologies*

# INTRODUCTION TO FRONT-END TECHNOLOGIES

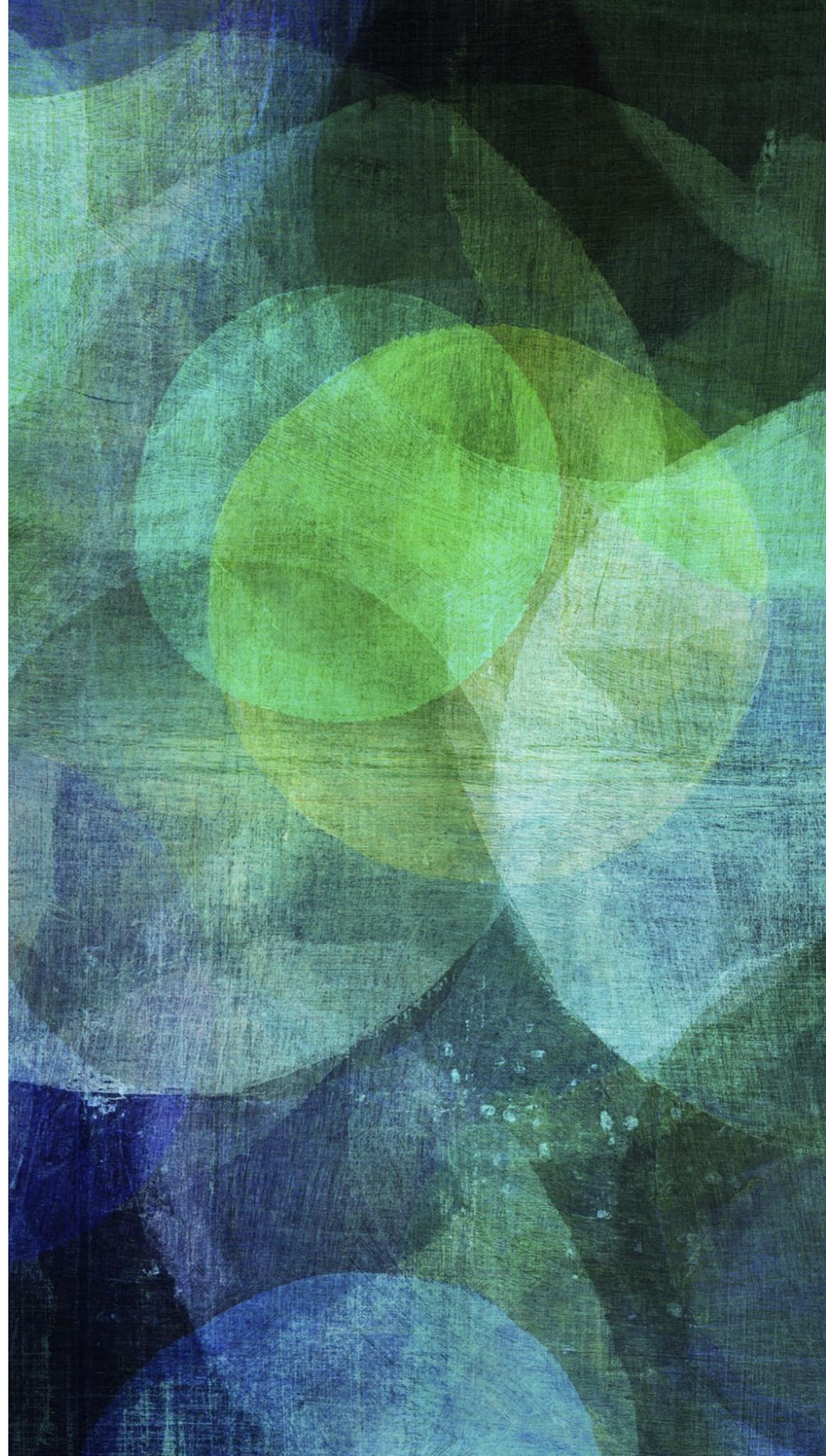
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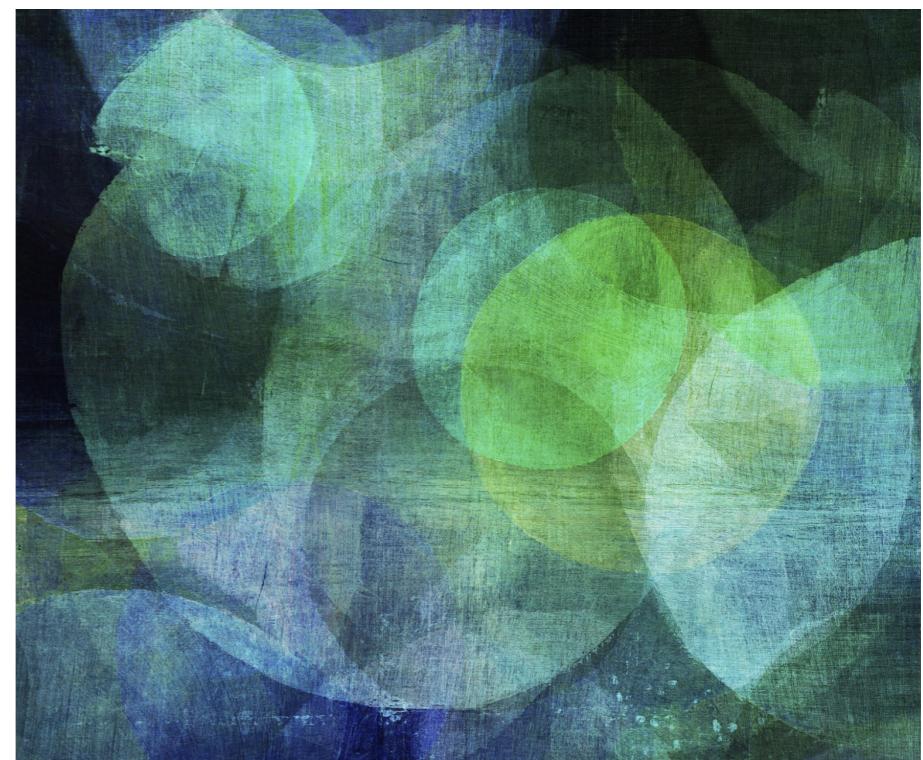
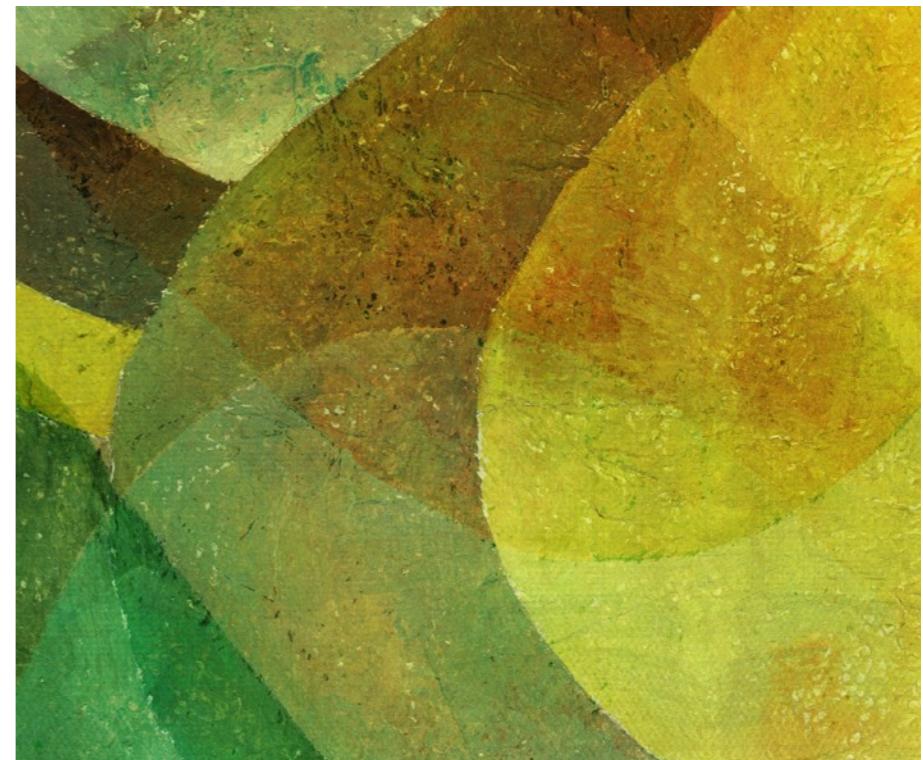
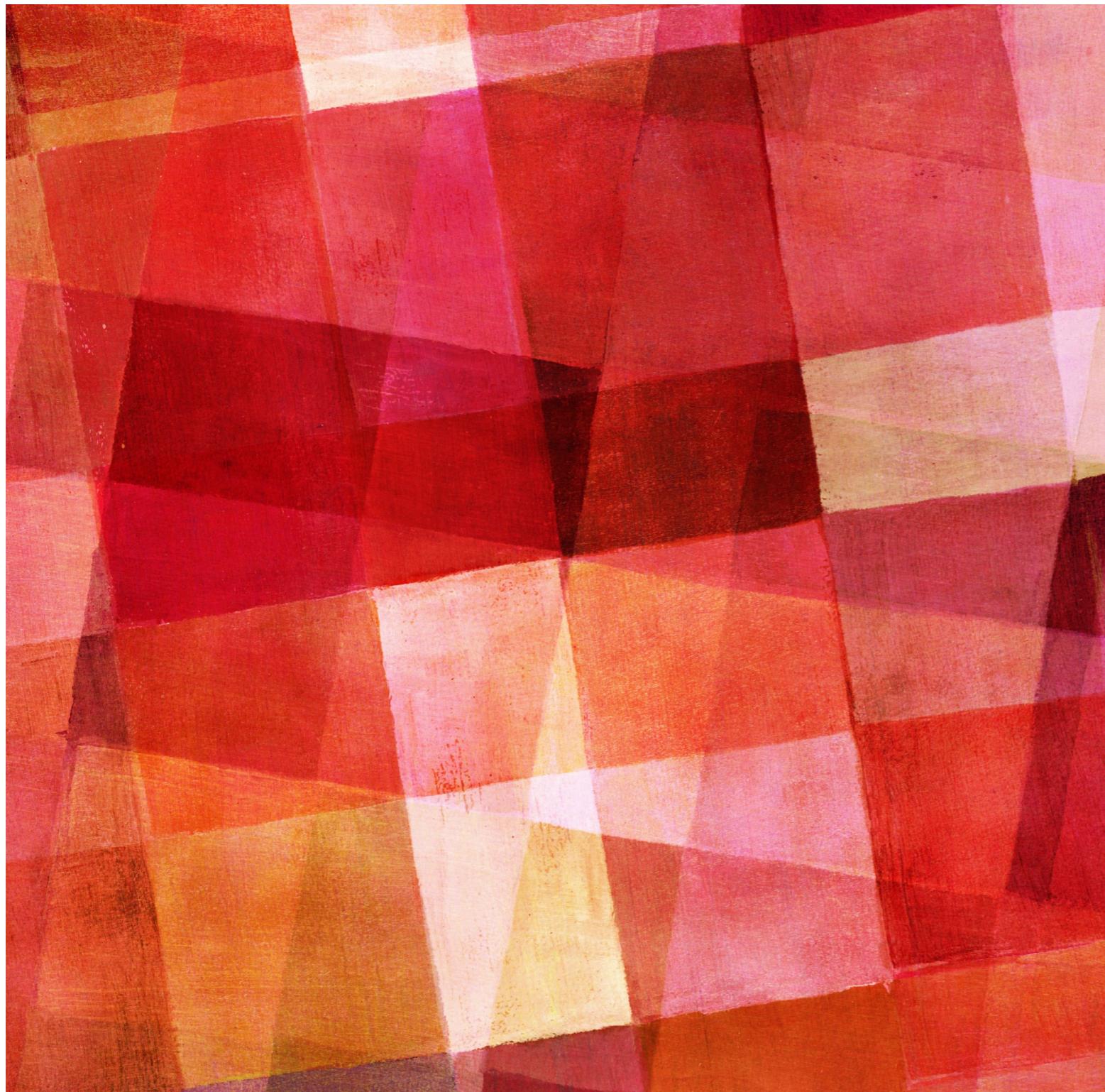
- What are the basic technologies used for front end web application development?
- What is the latest (standardized) version of each of the above technologies? What are some popular older versions?
- What technology is used to
  - Add an image to a web page?
  - Add a row to a shopping cart table when a new product is added?
  - Arrange content so that a sidebar is pushed to the left and main content appears in the centre of the screen
  - Change the fonts and colors used on a page?

# HTML

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*Web page content and  
structure*





*Basic Tags and Attributes*

# BASIC TAGS AND ATTRIBUTES

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- DOCTYPE declaration
- Tags and attributes
- html, head, body
- title, meta
- script, style and link
- Paragraphs, headings
- id, class, style, title attributes
- Basic CSS styling
- hr, br
- Links (anchor tag)



*Quiz*

*Basic Tags and Attributes*

# BASIC TAGS AND ATTRIBUTES

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- What does the `<!DOCTYPE html>` declaration do?
  
- What are the 2 tags that can be children of the `<html>` tag?
  
- Which element in an HTML document holds information about the page? Which element has the actual content of the page?

# BASIC TAGS AND ATTRIBUTES

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- Why does an `<h1>` tag appear in bigger font and in bold?  
Can these styles be customised?
- Which attribute will you use on the following so that they can be styled in CSS?
  - A paragraph that needs to be styled in red color.
  - A group of heading elements that need to appear italicised.

# BASIC TAGS AND ATTRIBUTES

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- To link to the wikipedia home page (<http://www.wikipedia.org>), what needs to be done?

`<a ____ = “_____”>Visit Wikipedia</a>`

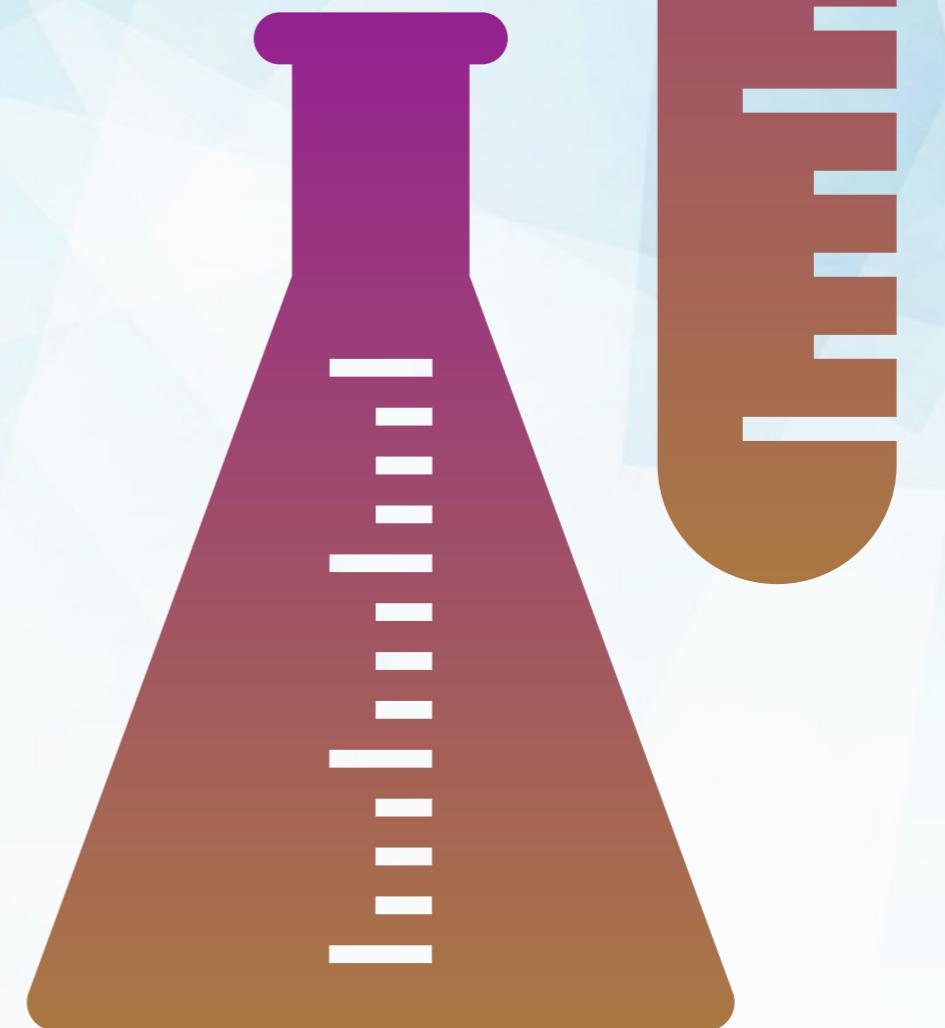
- In addition, to open the Wikipedia page in a separate tab, what attribute do we need to set?

`<a ____ = “_____” ____ = “_____”>Visit Wikipedia</a>`

# *Experiment*

## *Basic Tags and*

## *Attributes*



# BASIC TAGS AND ATTRIBUTES

---

- Create the HTML page as shown below. Make sure to select appropriate heading elements (use h1 only for the top-level heading). The first paragraphs in the introduction (first two) should have 1.2 times their normal size (apply the same class for each and style them using the class).

## The Walt Disney Company

---

The Walt Disney Company, commonly known as Disney, is an American diversified multinational mass media and entertainment conglomerate, headquartered at the Walt Disney Studios in Burbank, California. It is the world's second largest media conglomerate in terms of revenue, after Comcast.<sup>[3]</sup> Disney was founded on October 16, 1923 – by brothers Walt Disney and Roy O. Disney – as the Disney Brothers Cartoon Studio, and established itself as a leader in the American animation industry before diversifying into live-action film production, television, and theme parks. The company also operated under the names The Walt Disney Studio and then Walt Disney Productions. Taking on its current name in 1986, it expanded its existing operations and also started divisions focused upon theater, radio, music, publishing, and online media.

In addition, Disney has since created corporate divisions in order to market more mature content than is typically associated with its flagship family-oriented brands. The company is best known for the products of its film studio, Walt Disney Studios, which is today one of the largest and best-known studios in American cinema. Disney's other three main divisions are Walt Disney Parks and Resorts, Disney Media Networks, and Disney Consumer Products and Interactive Media.<sup>[4]</sup> Disney also owns and operates the ABC broadcast television network; cable television networks such as Disney Channel, ESPN, A+E Networks, and Freeform; publishing, merchandising, music, and theatre divisions; and owns and licenses 14 theme parks around the world.<sup>[5][6]</sup> The company has been a component of the Dow Jones Industrial Average since May 6, 1991. Mickey Mouse, an early and well-known cartoon creation of the company, is a primary symbol and mascot for Disney.

## Corporate history

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### 1919–1928: The silent era

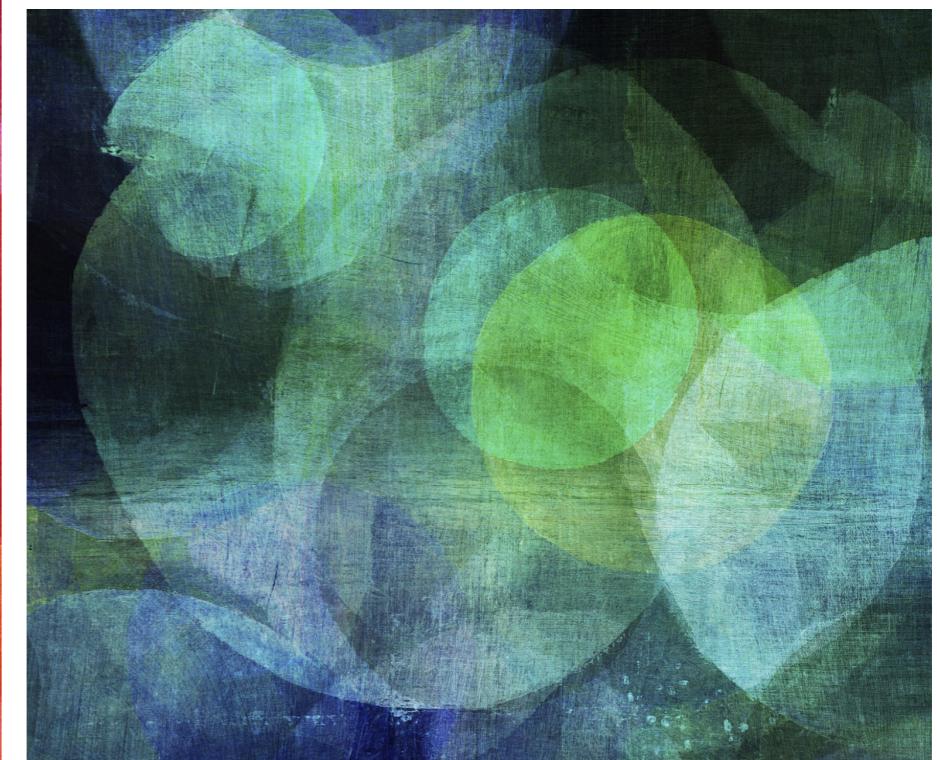
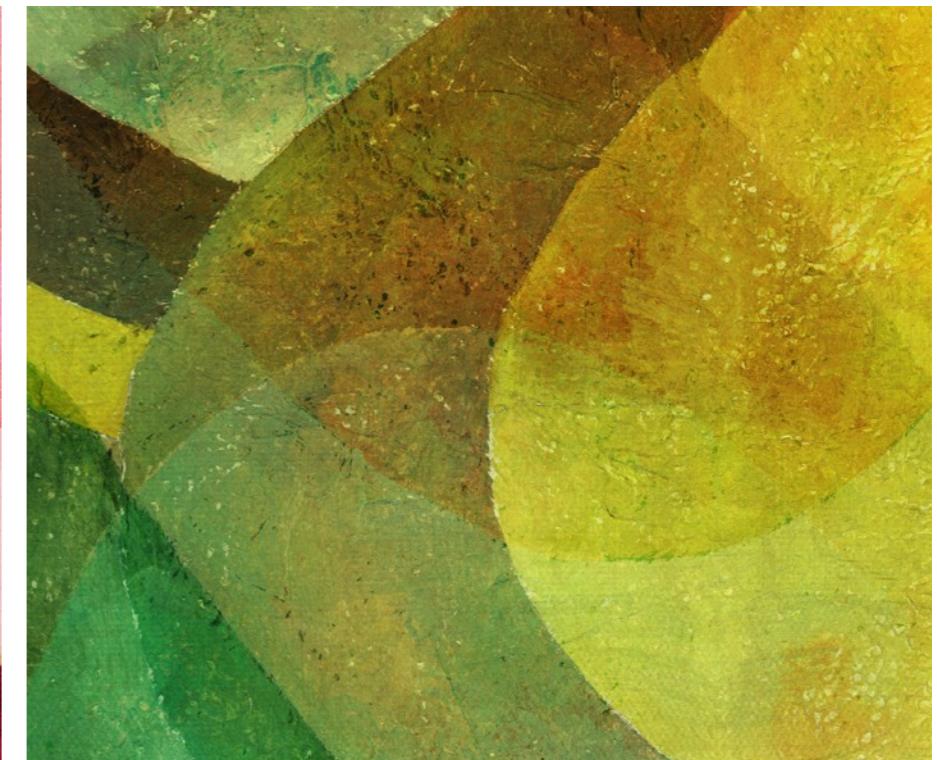
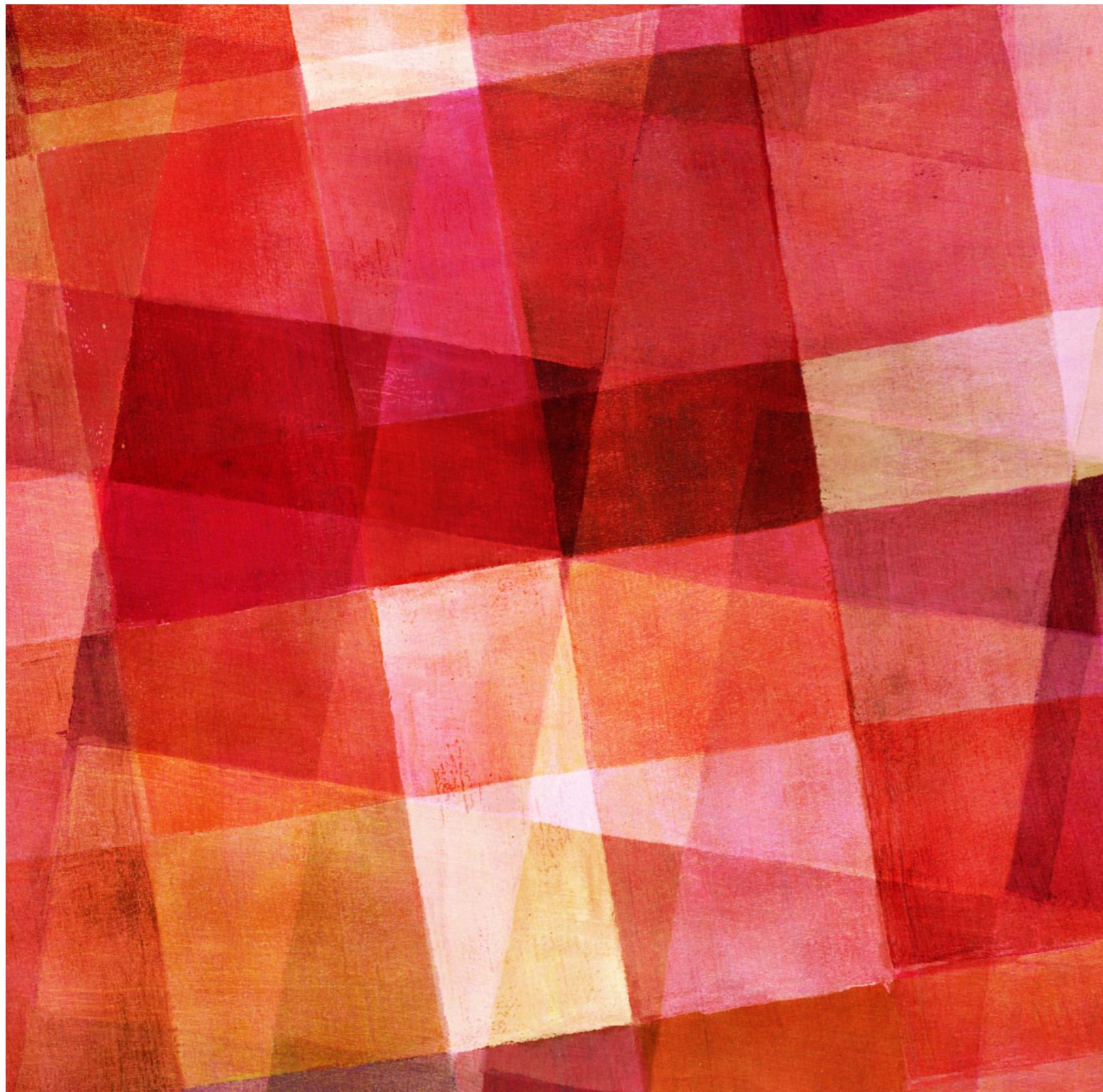
In early 1923, Kansas City, Missouri, animator Walt Disney created a short film entitled *Alice's Wonderland*, which featured child actress Virginia Davis interacting with animated characters. After the bankruptcy in 1923 of his previous firm, Laugh-O-Gram Studios,<sup>[ChWDC 1]</sup> Disney moved to Hollywood to join his brother, Roy O. Disney. Film distributor Margaret J. Winkler of M.J. Winkler Productions contacted Disney with plans to distribute a whole series of *Alice Comedies* purchased for \$1,500 per reel with Disney as a production partner. Walt and Roy Disney formed Disney Brothers Cartoon Studio that same year. More animated films followed after *Alice*.<sup>[8]</sup> In January 1926, with the completion of the Disney studio on Hyperion Street, the Disney Brothers Studio's name was changed to the Walt Disney Studio.<sup>[ChWDC 2]</sup>

After the demise of the *Alice* comedies, Disney developed an all-cartoon series starring his first original character, Oswald the Lucky Rabbit,<sup>[8]</sup> which was distributed by Winkler Pictures through Universal Pictures.<sup>[ChWDC 2]</sup> The distributor owned Oswald, so Disney only made a few hundred dollars.<sup>[8]</sup> Disney completed 26 Oswald shorts before losing the contract in February 1928, due to a legal loophole, when Winkler's husband Charles Mintz took over their distribution company. After failing to take over the Disney Studio, Mintz hired away four of Disney's primary animators (the exception being Ub Iwerks) to start his own animation studio, Snappy Comedies.

## References

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For more information visit [the Wikipedia page](#).



*Container Tags*

# CONTAINER TAGS

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- Inline and block-level elements
- CSS display property
- The inline-block value for display
- Block-level container - div
- Inline container - span
- Grouping elements to be styled together using a div (exploits inheritance of CSS styles)
- Targeting a piece of inline content using span



*Quiz*  
*Containers tags*

# CONTAINER TAGS

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- What is the **default width** for a block-level element?
- What is the **default width** for an inline element?
- What is the **default height** for a block-level element? How about an inline element?
- How can we change the default width and height of elements?
- How can you change an inline element to a block-level one and vice-versa?

# CONTAINER TAGS

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- Classify the following as block-level and inline elements
  - p
  - a
  - h3
  - span
  - hr
  - div

# *Experiment*

## *Containers tags*



# CONTAINER TAGS

---

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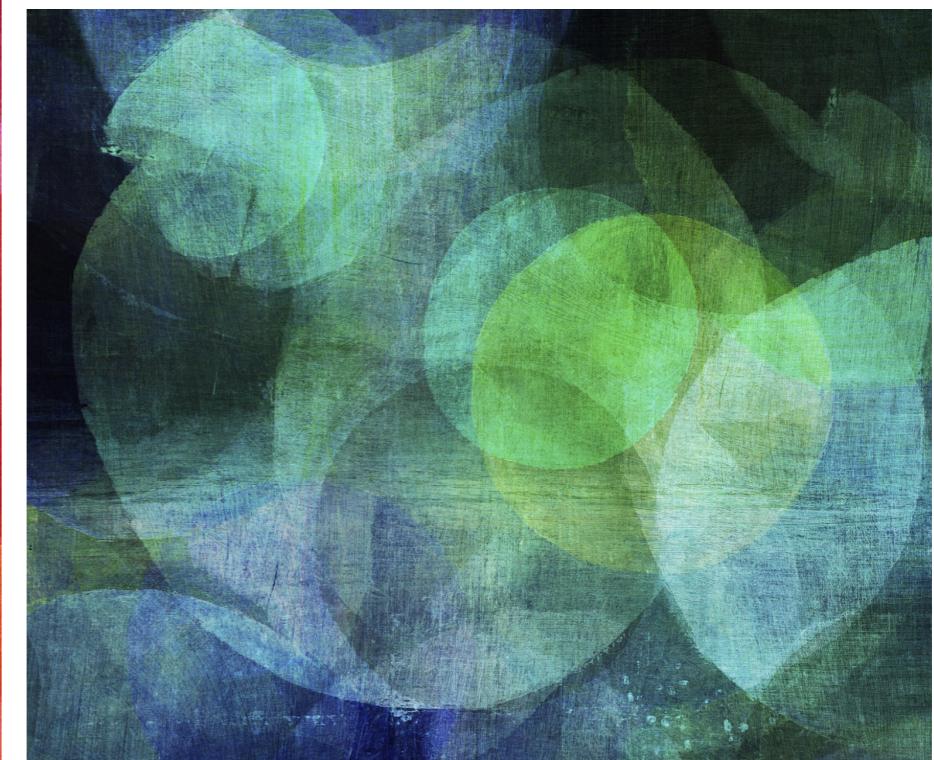
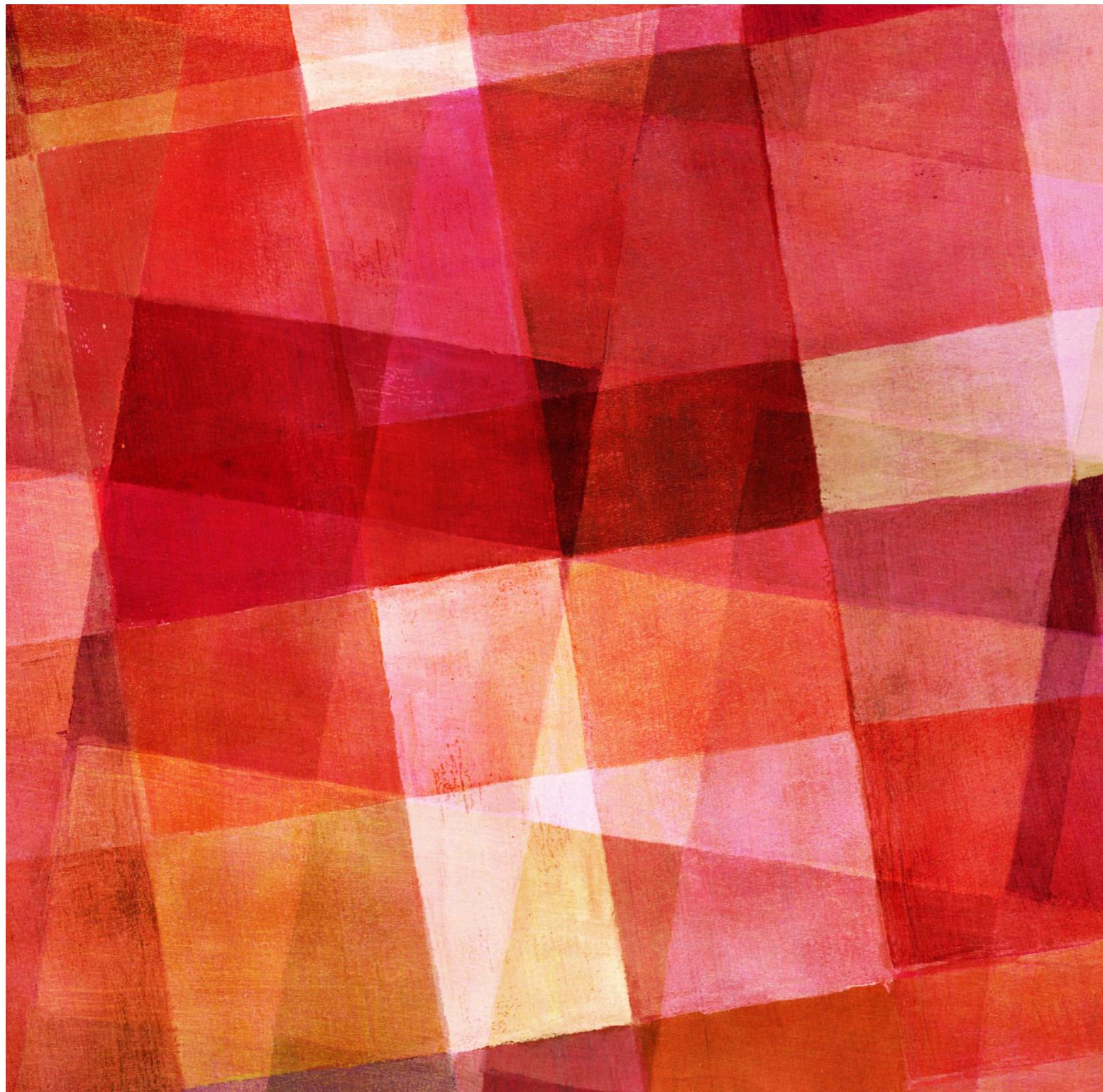
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## References

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# *Media Elements*

# MEDIA ELEMENTS

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- img - alt attribute benefits
- audio (HTML5)
- video (HTML5)



*Quiz*  
*Media elements*

# MEDIA ELEMENTS

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- To include an image *my-pup-at-play.jpg* in the same folder as the HTML document, you need to add attribute-value...

`<img __=“_____” />`

- If the same image is inside an *images/* folder (*images/* folder and the HTML document are within same folder), then...

`<img __=“_____” />`

- If the images folder is in the parent folder of folder containing the HTML document,

`<img __=“_____” />`

- To include an image from Wikipedia - <https://commons.wikimedia.org/wiki/File:Kingswellstudio.JPG>

`<img __=“_____” />`

# MEDIA ELEMENTS

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- Why is it a good practice to include an *alt* attribute for an image? Choose the best option(s).
  - Search engines can index the page better and it improves SEO (page ranking)
  - Provides feedback to user when image cannot be displayed due to some reason
  - Helps screen readers understand the image, thereby improving *accessibility* (improved experience for people with disabilities)
- Why do we require multiple source tags for audio and video
- Name 2 attributes that can be set on an audio/video element.
- Name 2 attributes that are set on the <source/> tag within the audio/video element.

# *Experiment*

# *Media elements*



# MEDIA ELEMENTS

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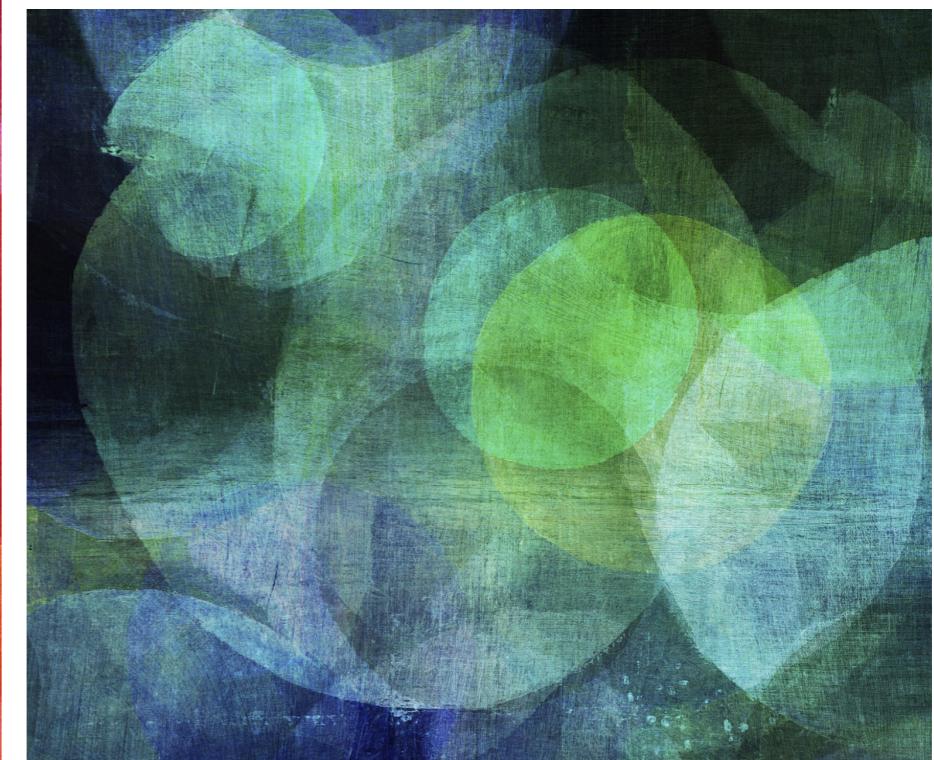
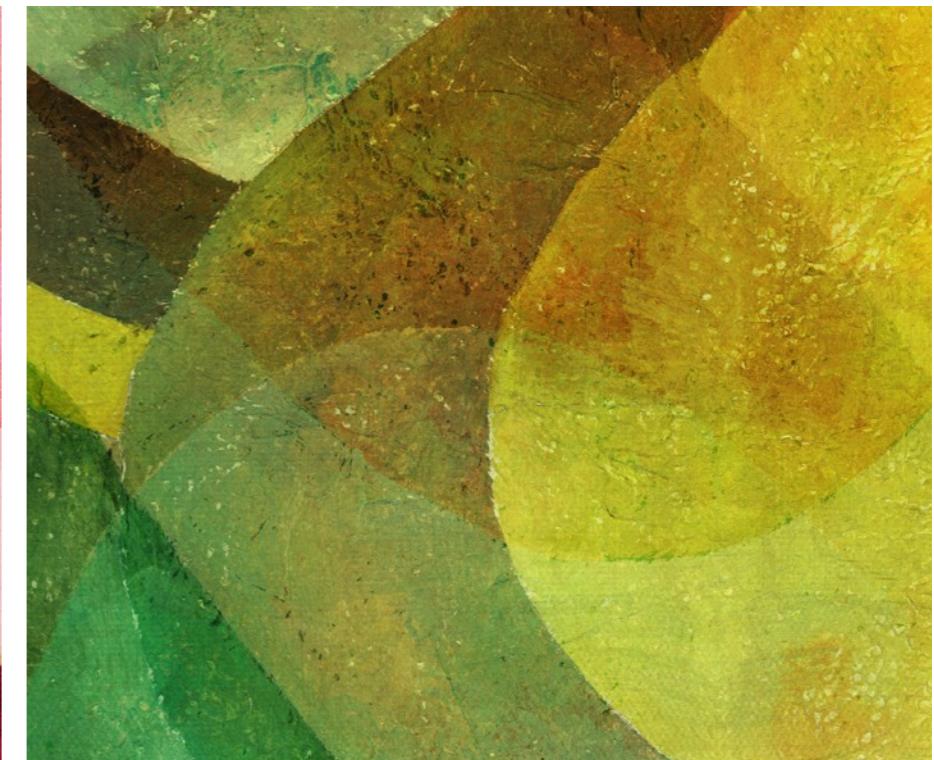
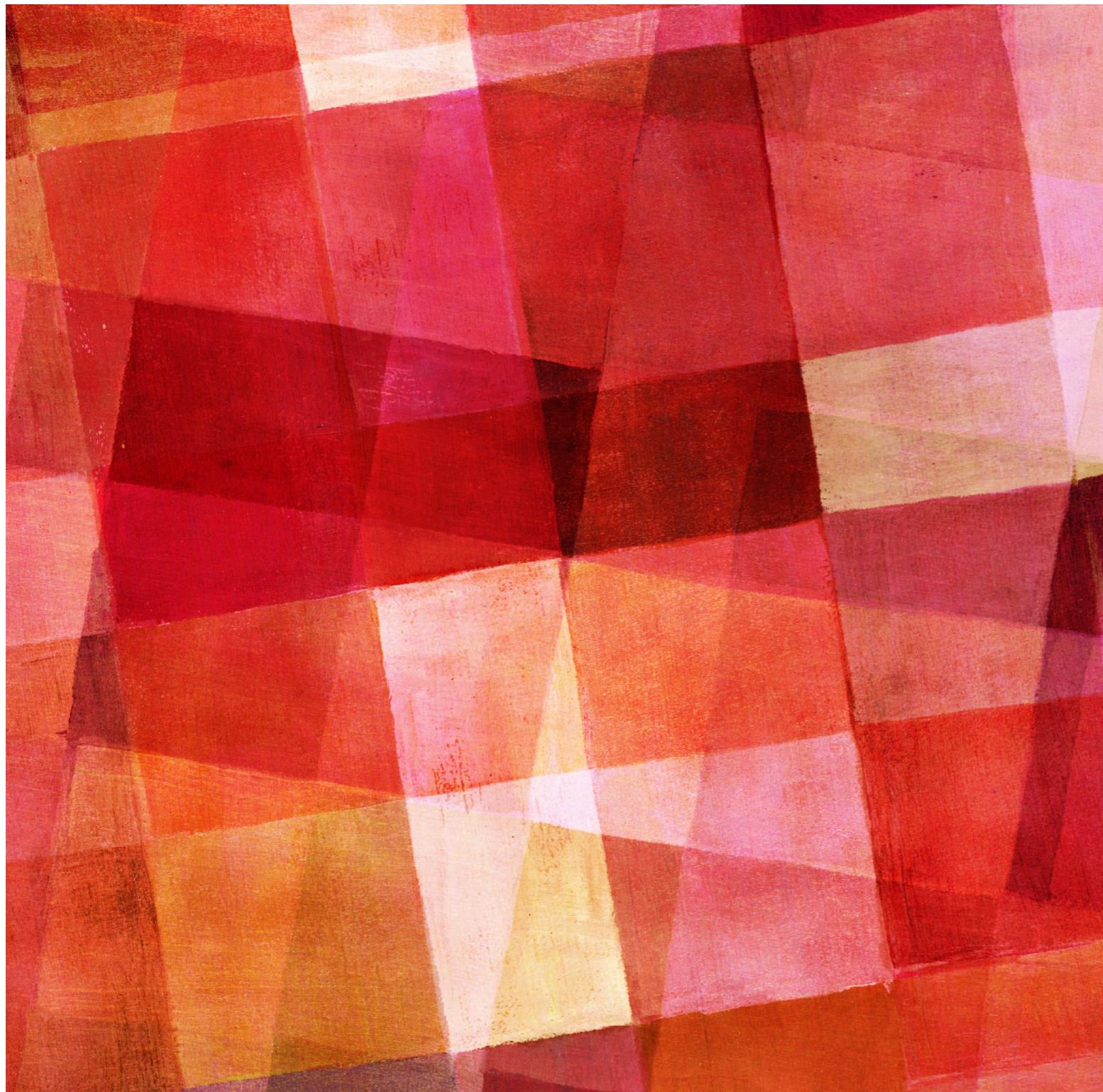
- Create a page with the following image and video embedded in it.
- The image should have an alt attribute describing it
- The video should have controls, should restart automatically every time it reaches the end, and should start playing automatically when the HTML page loads.

The First Walt Disney Studio



Drop falling onto a glass of water





*Tables*

# TABLES

---

- table, thead, tbody, tr, td, th
- colspan, rowspan
- Applying borders to a table
- Zebra-striping (background color for alternate rows)



*Quiz  
Tables*

# TABLES

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- What are some of the tags related to tables in HTML?
- What are the attributes on td to have it span multiple columns and rows?
- How do we give borders to tables?

```
<style>
  table {
    _____: _____;
  }
  table, td {
    _____: _____;
  }
</style>
```

- How do we give zebra stripes for tables?

```
<style>
  td: _____(____) {
    _____: _____;
  }
</style>
```

# *Experiment Tables*



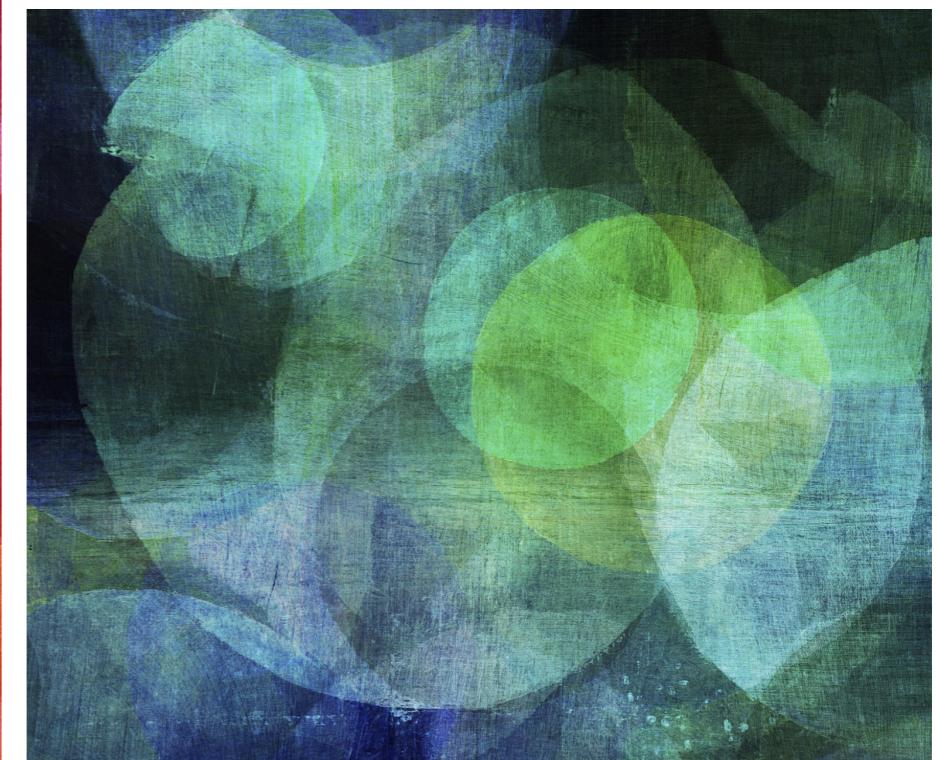
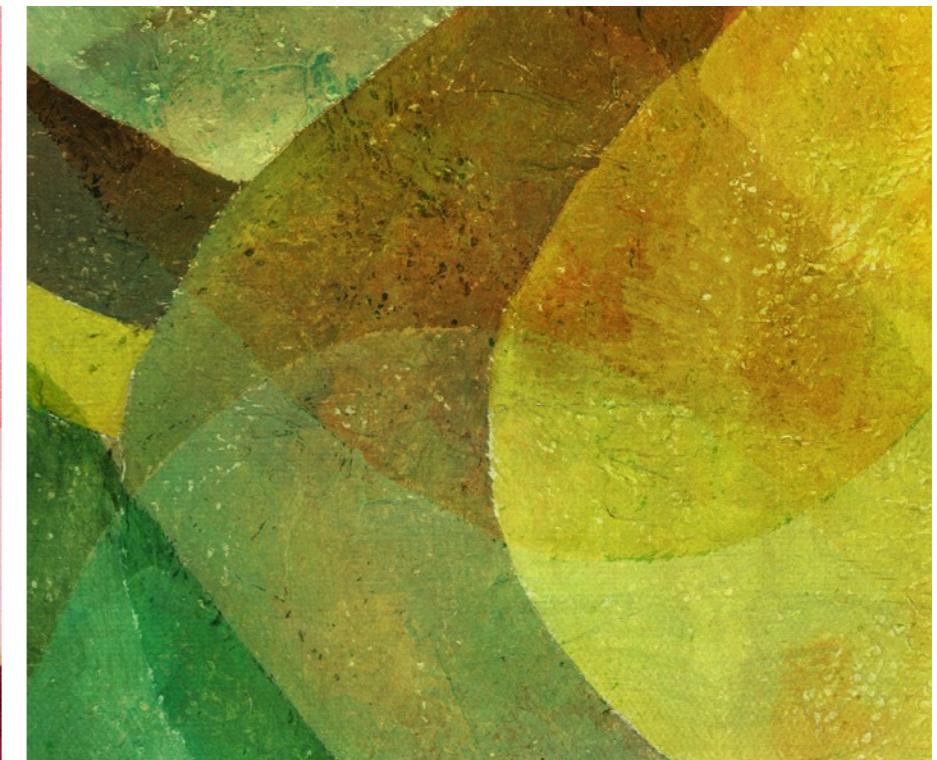
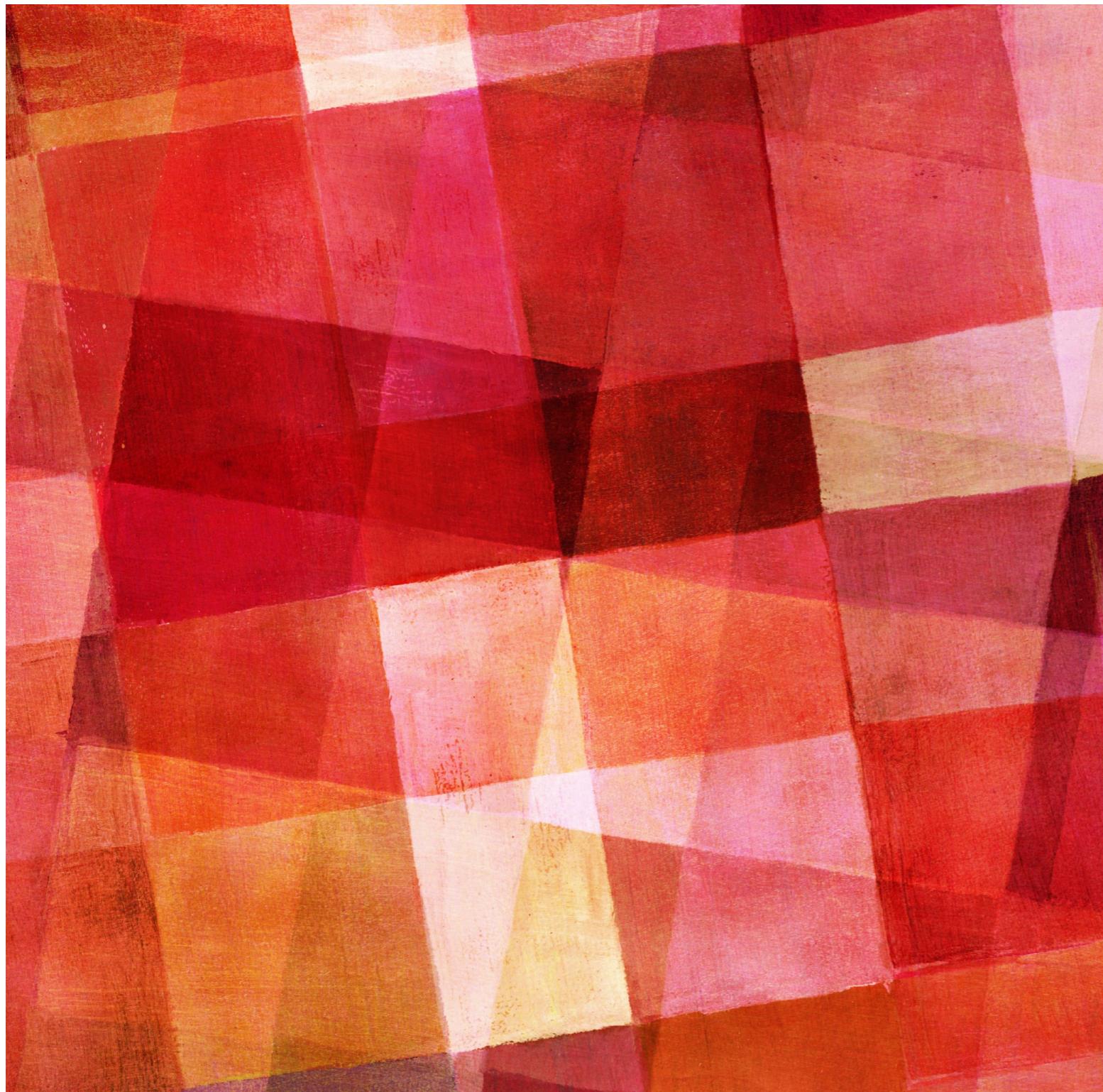
# TABLES

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- Create a table to hold contact number of your contacts as shown on the screenshot. Make sure to give a caption for the table, and add borders and padding for table and its cells as shown
- Modify the above table so you can have multiple phone numbers for a contact. Make sure the table is full width of the parent.

Phone Book		
	Name	Phone number
1	Anil	9887766554
2	Divya	9887766553
3	John	9887766557
4	Jane	9887766558

Phone Book		
	Name	Phone number
1	Anil	9887766554
		9887766564
2	Divya	9887766553
		9887766556
3	John	9887766557
		9887766559
4	Jane	9887766558
		9887766568



*Lists*

# LISTS

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- Unordered and ordered lists - ul, ol
- List item - li
- Styling bullets/numbering
- Creating a list of menu items using list tags



*Quiz  
Lists*

# LISTS

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- What are the two types of lists in HTML?
- Which of these are block-level elements and which are inline?
  - ul, ol, li

# LISTS

---

- How do we change the list bullets/numbering mechanism to lowercase letters?

```
<style>
  li {
    _____: _____;
  }
</style>
```

- If we had to remove the bullets for a list, what could we do?

```
<style>
  li {
    _____: _____;
  }
</style>
```

- If we had to have the list items next to each other, what could we do?

```
<style>
  li {
    _____: _____;
  }
</style>
```

# *Experiment Lists*



# LISTS

---

- Create a list of fruits to purchase.
  - Make sure to use a circle as the bullets.
  
- Lists are often used to create menus.

List items become menu items. In order to have menu items next to each other we change the list item to an inline element. Create a menu as shown below, using this approach.

## Fruits to purchase

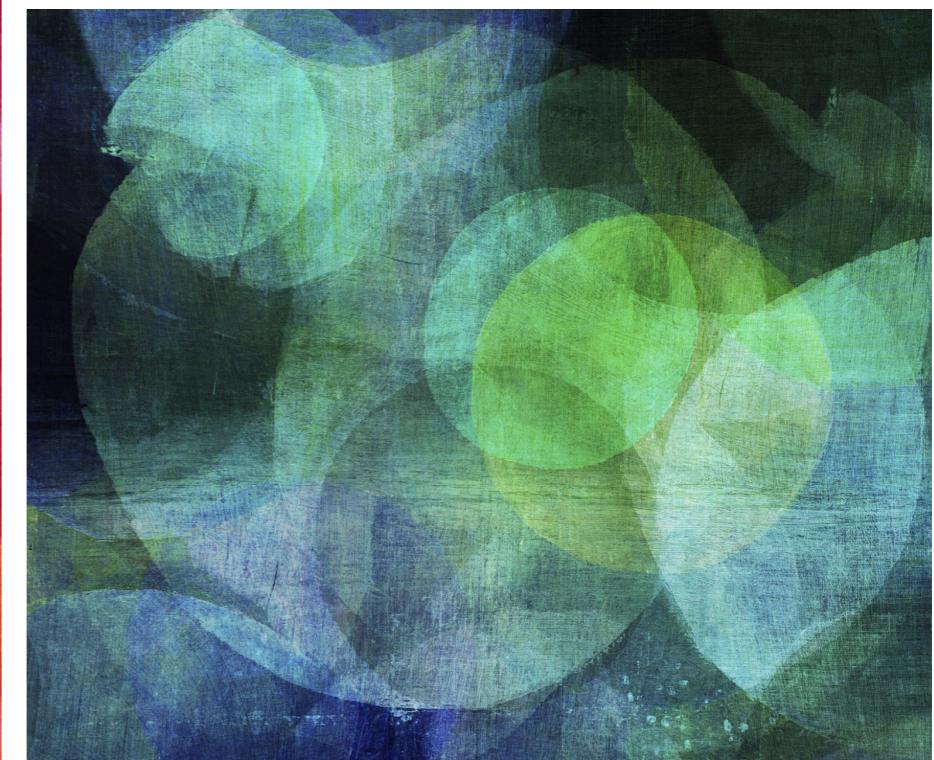
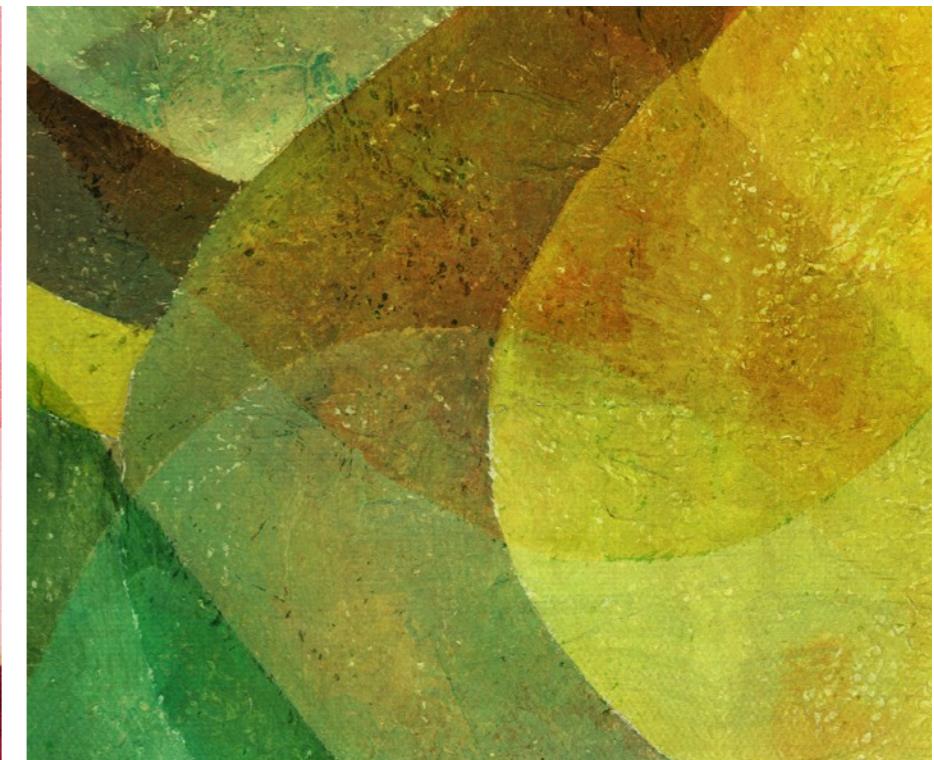
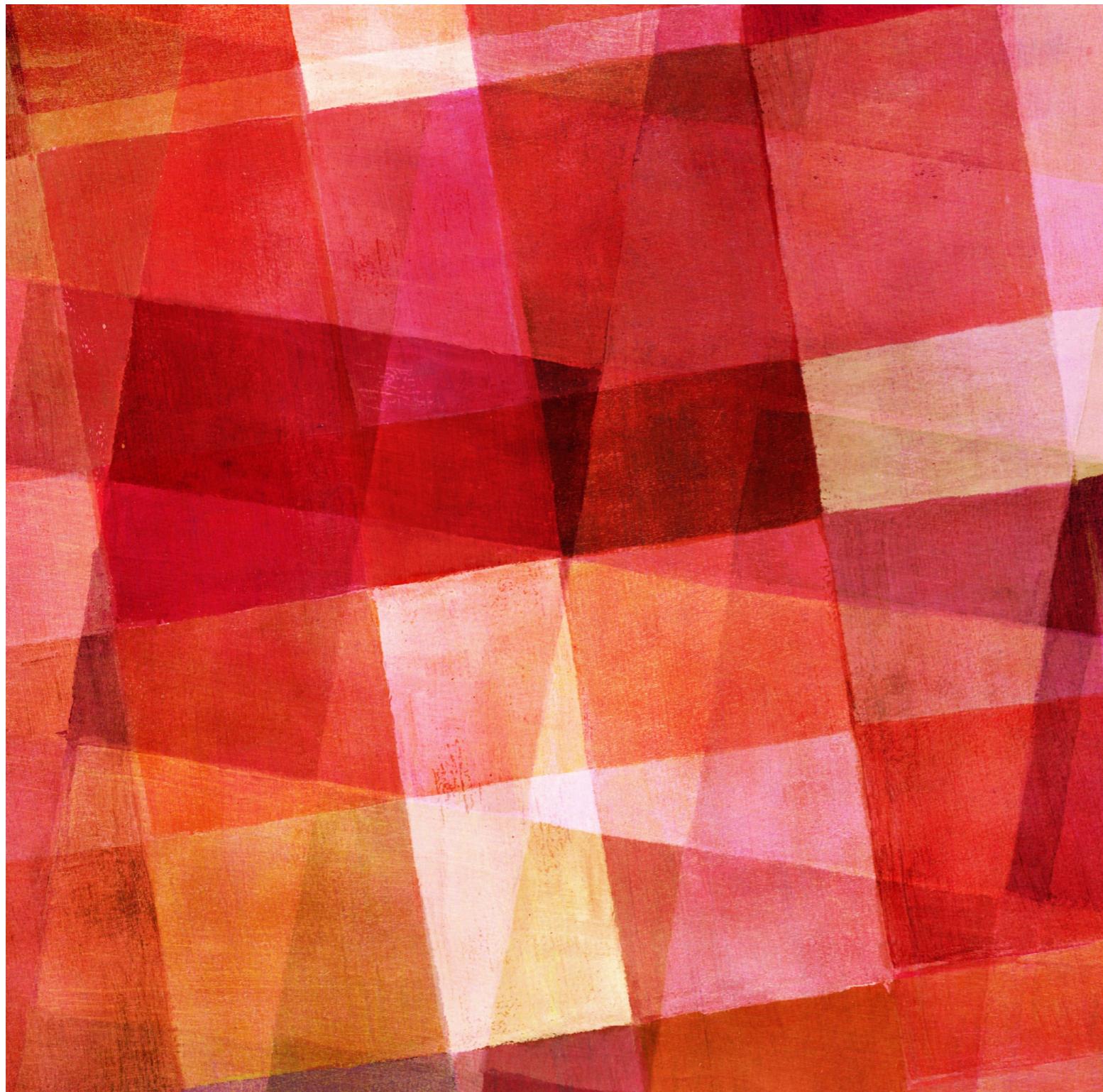
---

- Apples
- Oranges
- Bananas

[About us](#)

[Our Services](#)

[Contact us](#)



*Forms*

# FORMS

---

- form tags and attributes (action, method, enctype)
- input elements and attributes - type, name, value
- label
- input elements - text, date, email, password, textarea, select, radio buttons, checkboxes, file upload
- Submit and reset buttons
- Styling forms



*Quiz  
Forms*

# FORMS

---

- Which attribute of a form input element is mandatory if the input field's value has to be submitted to the server?
- Which attribute of an input element sets the default value for an input element?
- Why is it a good idea to have a label for every form input element?
- What tags are involved in configuring a dropdown?
- How do you make a dropdown that can accept more than one input selection?
- Why is it preferable to embed radio buttons and checkboxes inside label?
- How will you group a set of related radio buttons/checkboxes?
- Forms submitted by GET method have their data submitted via? (Query string parameters/HTTP body)

# FORMS

---

- How would you make sure a request for <https://mysite.com/process-login> is submitted when login form is submitted

```
<form _____="_____ " id="login-form">...</form>
```

- Which HTTP method is preferred for submitting forms? How is the submission method configured for forms?

```
<form _____="_____ " id="login-form">...</form>
```

- We would like to set the default value for city input field to Bangalore. How would we do it?

```
<input type="text" id="city" name="city" _____="_____ " />
```

- How will you configure a submit and reset buttons?

```
<input _____="_____ " _____="_____ " />
```

# *Experiment Forms*



# FORMS

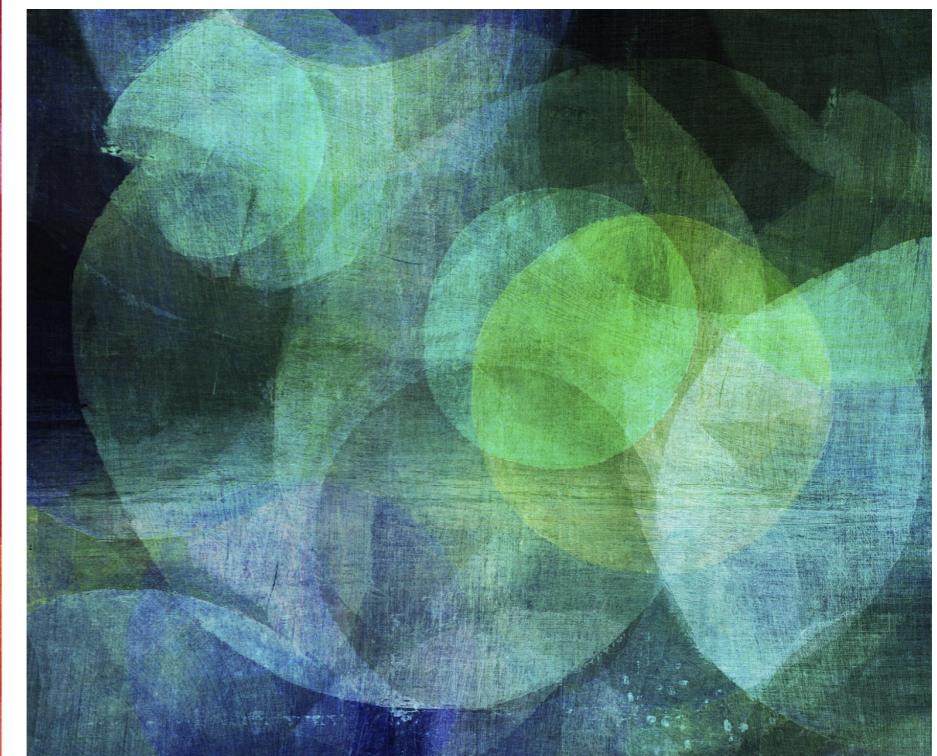
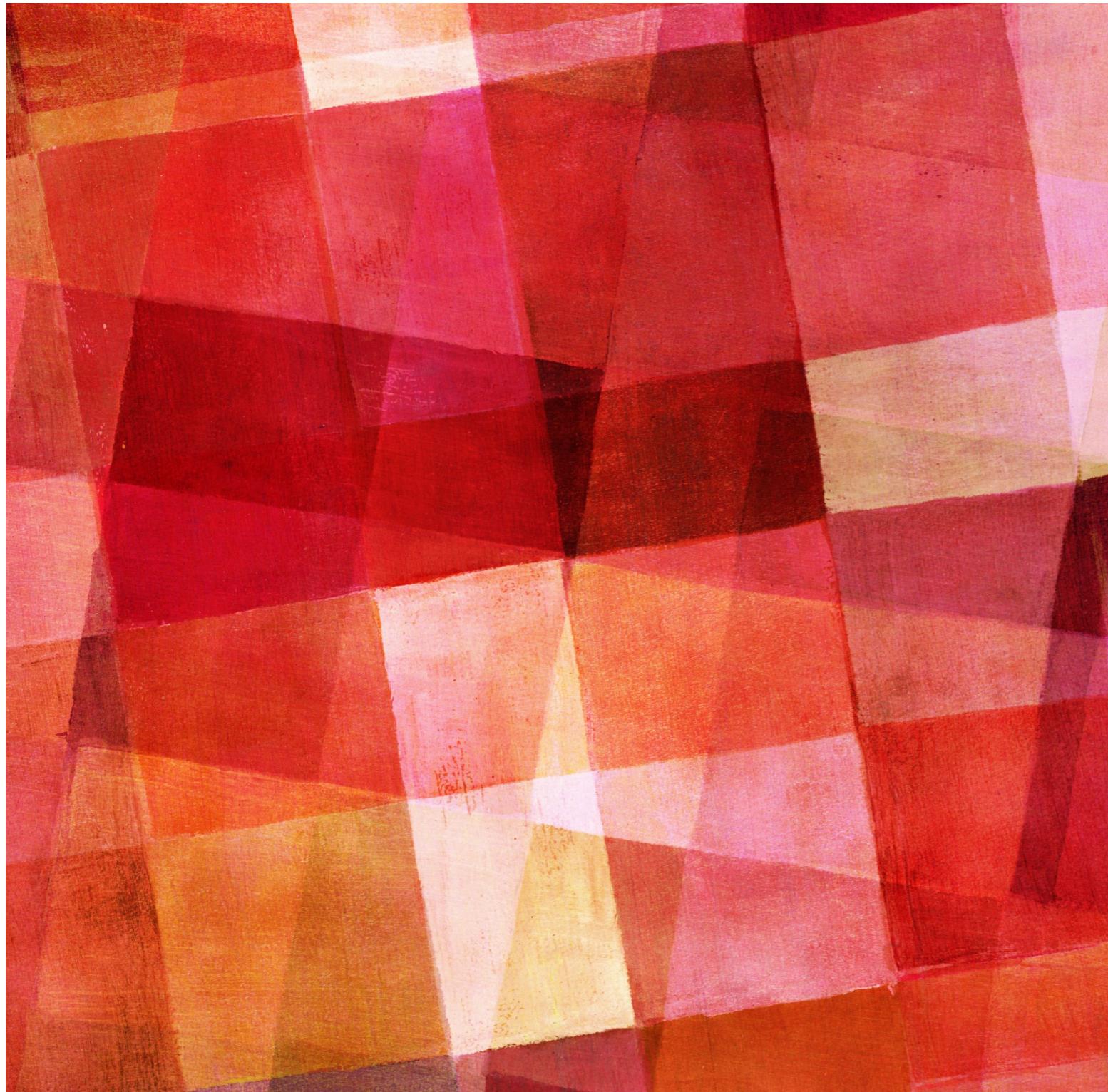
---

- Create a contact form as shown below. Name, email and message are mandatory fields. Chennai, Bangalore and Mumbai are cities in the dropdown with values being MAS, BLR and BOM respectively. Wrap the label and input elements in a container div and use appropriate classes to style the form neatly (float, overflow, width properties in CSS). When the form is submitted, a request should be POSTed to save-message.html with all input values.

## Contact Form

---

Full name	<input type="text"/>
Email	<input type="text"/>
Preferred day to contact you	<input type="text"/> dd/mm/yyyy
Your city	<input type="text"/> Bangalore 
Message	<input type="text"/>



*Form Validation using HTML5 attributes*

# FORM VALIDATION USING HTML5 ATTRIBUTES

---

- Other new input types
  - datalist, number, url, tel, range, search
- placeholder
- readonly, disabled
- maxlength, min, max, step
- pattern
- required
- novalidate
- formmethod, formaction, formnovalidate



*Quiz*

*Form validation Using HTML5*

*Attributes*

# FORM VALIDATION USING HTML5 ATTRIBUTES

---

- How will you declare a datalist? How can an input element be associate with a datalist? Can multiple input elements be associated with the same datalist?
- Which attribute is used to provide hint text within an input?
- What are the differences between disabled and readonly fields?
- What is the difference between formaction and action attribute?

# FORM VALIDATION USING HTML5 ATTRIBUTES

---

- How would add a submit button that bypasses form validation on being clicked?

```
<input type="_____" _____ />
```

- We require an input element where user can enter a value between 1 and 100 (integers)?

```
<input type="_____" _____="_____" _____="_____" id="score-on-certification-exam" />
```

- We would like to make sure user enters employee id in correct format. An employee id consists of two letters (A-Z) followed by 6 digits (0-9).

```
<input type="text" name="employee-id" _____="_____" />
```

# *Experiment Form Validation Using HTML5 Attributes*



# FORM VALIDATION USING HTML5 ATTRIBUTES

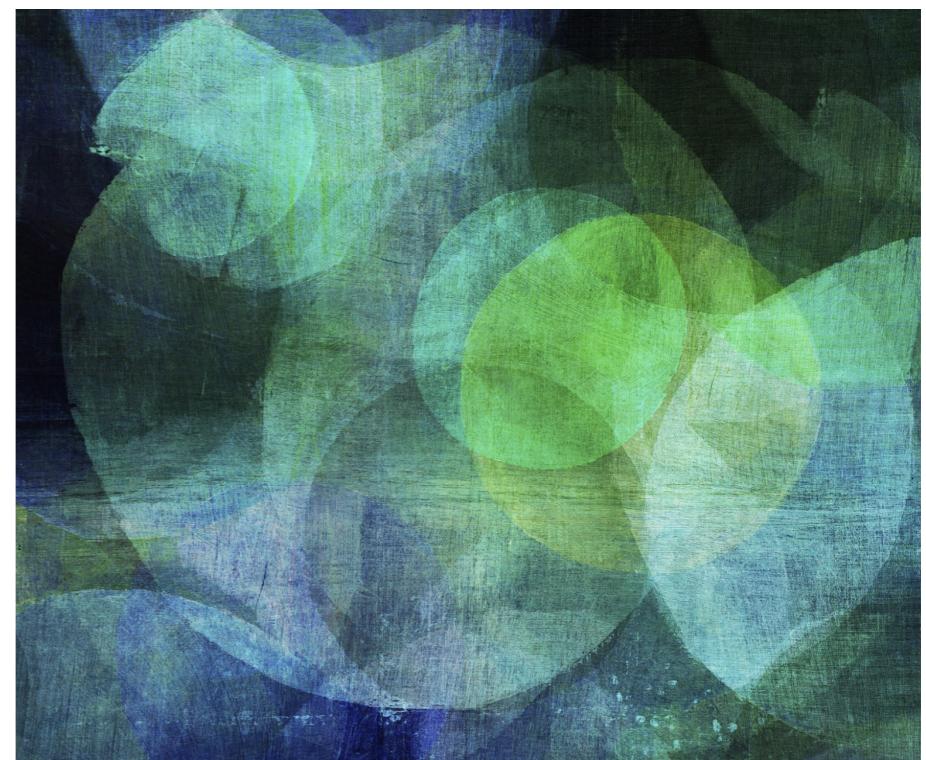
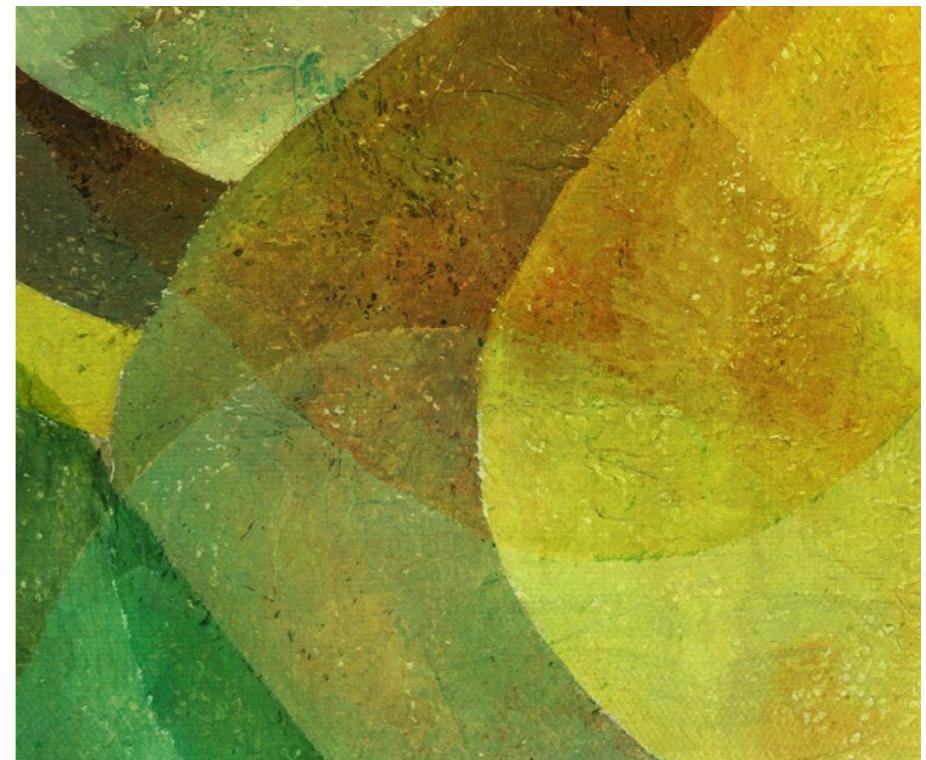
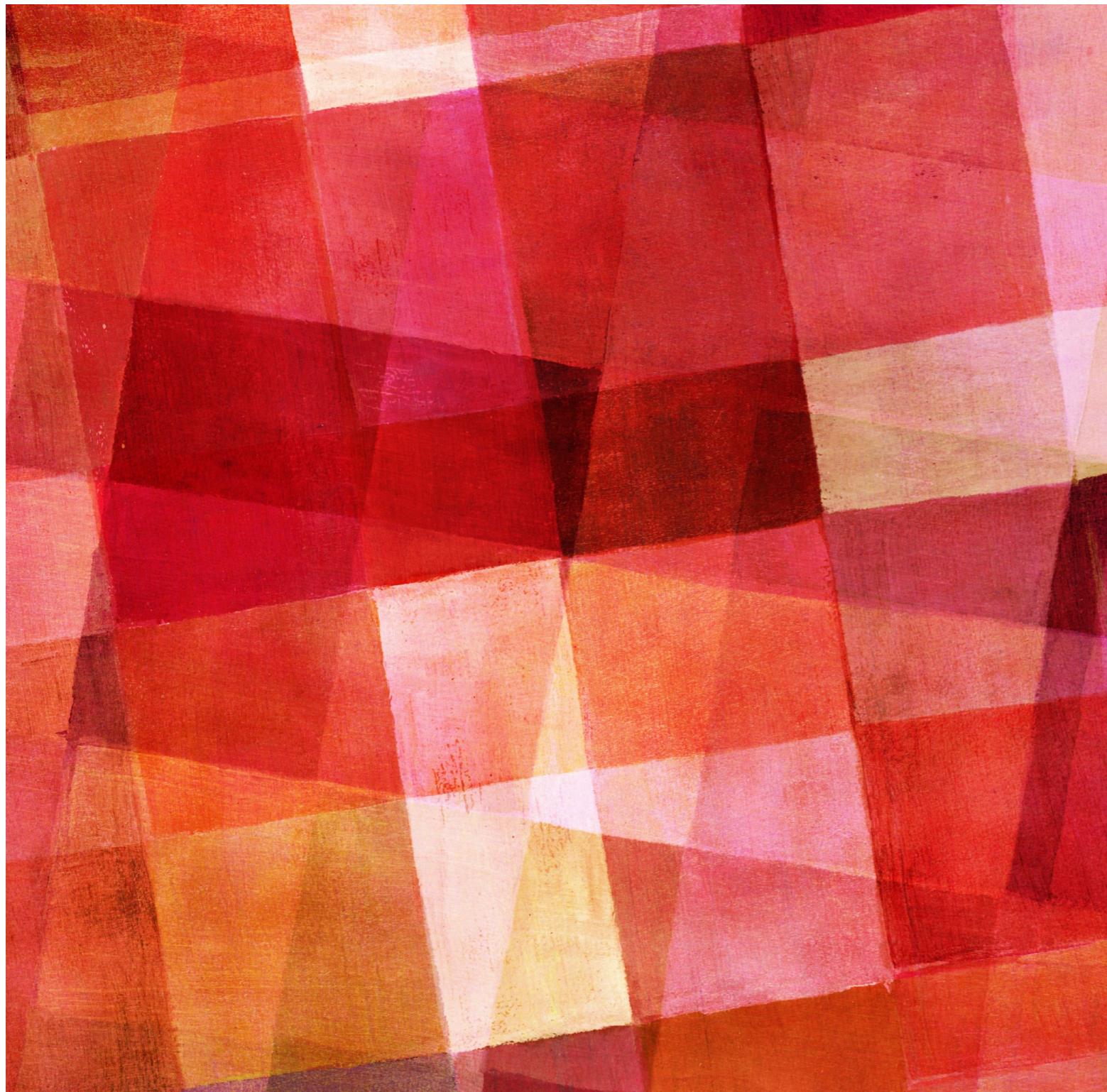
---

- Modify the contact form as shown below. All fields except preferred day and city are required. Phone numbers should follow the format shown in hint text. The country code can have 2 - 3 digits. The state code is always 2 digits long and does not begin with 0. Phone number can have 6 - 10 digits and cannot begin with 0.

## Contact Form

---

Full name	<input type="text" value="John"/>
Email	<input type="text" value="john@example.com"/>
Phone number	<input type="text" value="+91-80-12345678"/>
Preferred day to contact you	<input type="text" value="dd / mm / yyyy"/>
Your city	<input type="text" value="Bangalore"/>
Message	<input type="text" value="I run a small grocery shop. I want an e-commerce website for my business."/>

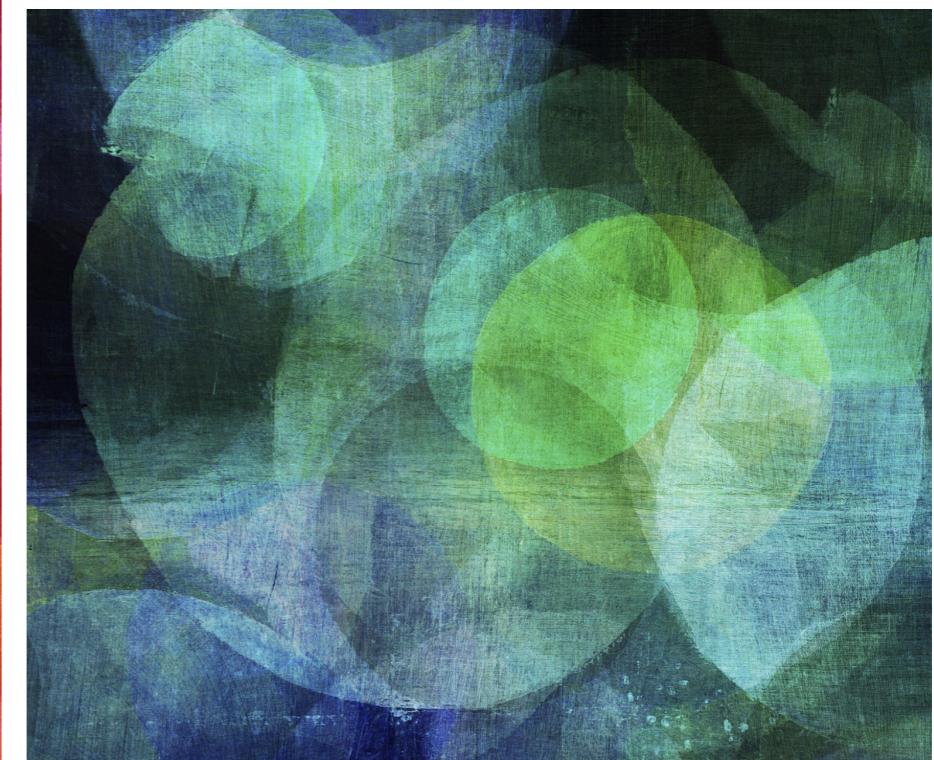
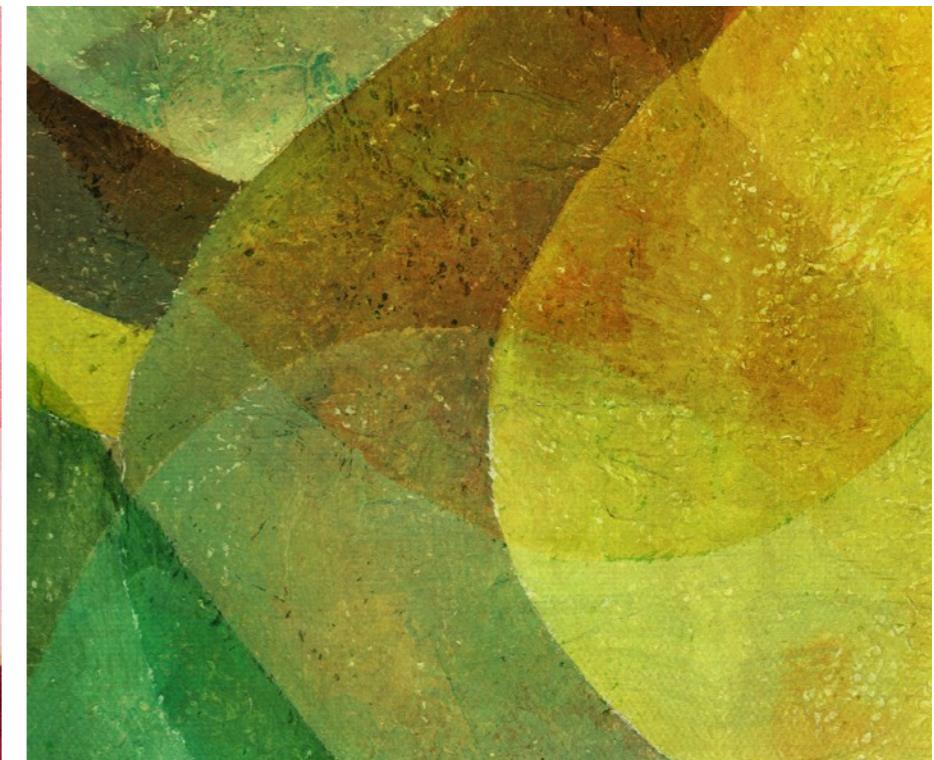
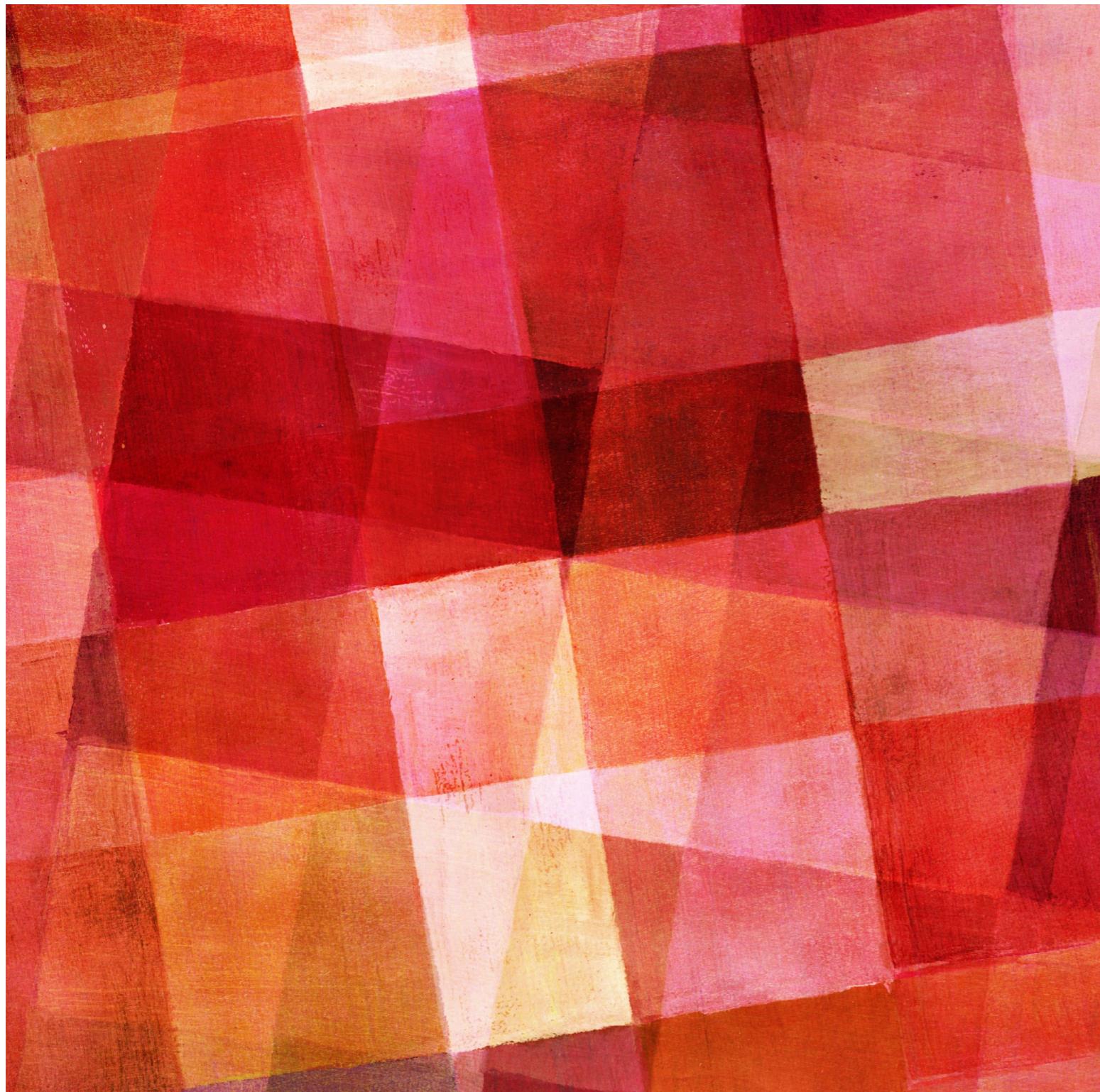


*Character Entities and Symbols*

# CHARACTER ENTITIES AND SYMBOLS

---

- &nbsp; (equivalently &#x000A0; &#160;)
- &copy;
- &gt; and &lt;
- &pound; &euro; &yen; etc.
- &times;
- Reference: <https://dev.w3.org/html5/html-author/charref>



*Semantic tags*

# SEMANTIC TAGS

---

- nav, header, footer
- article, section
- aside
- figure, figcaption

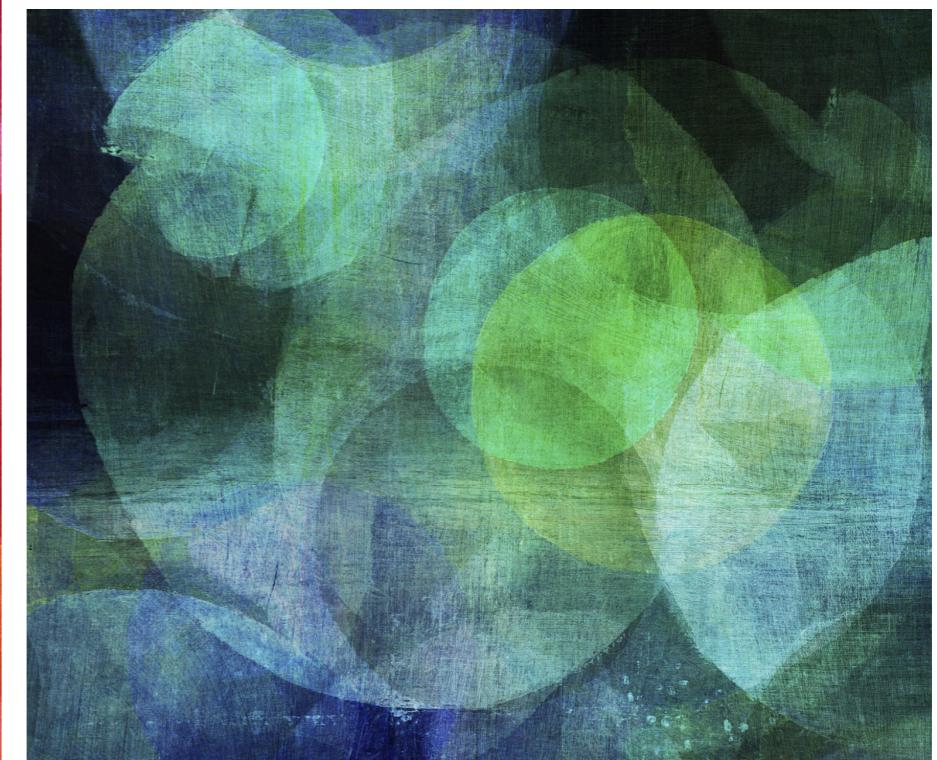
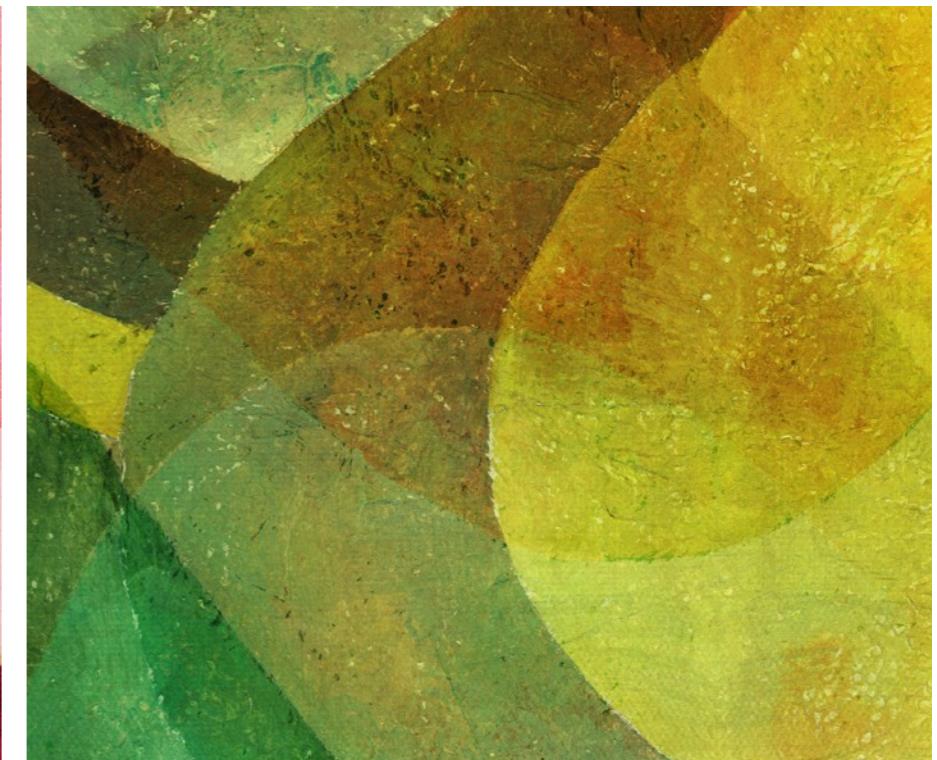
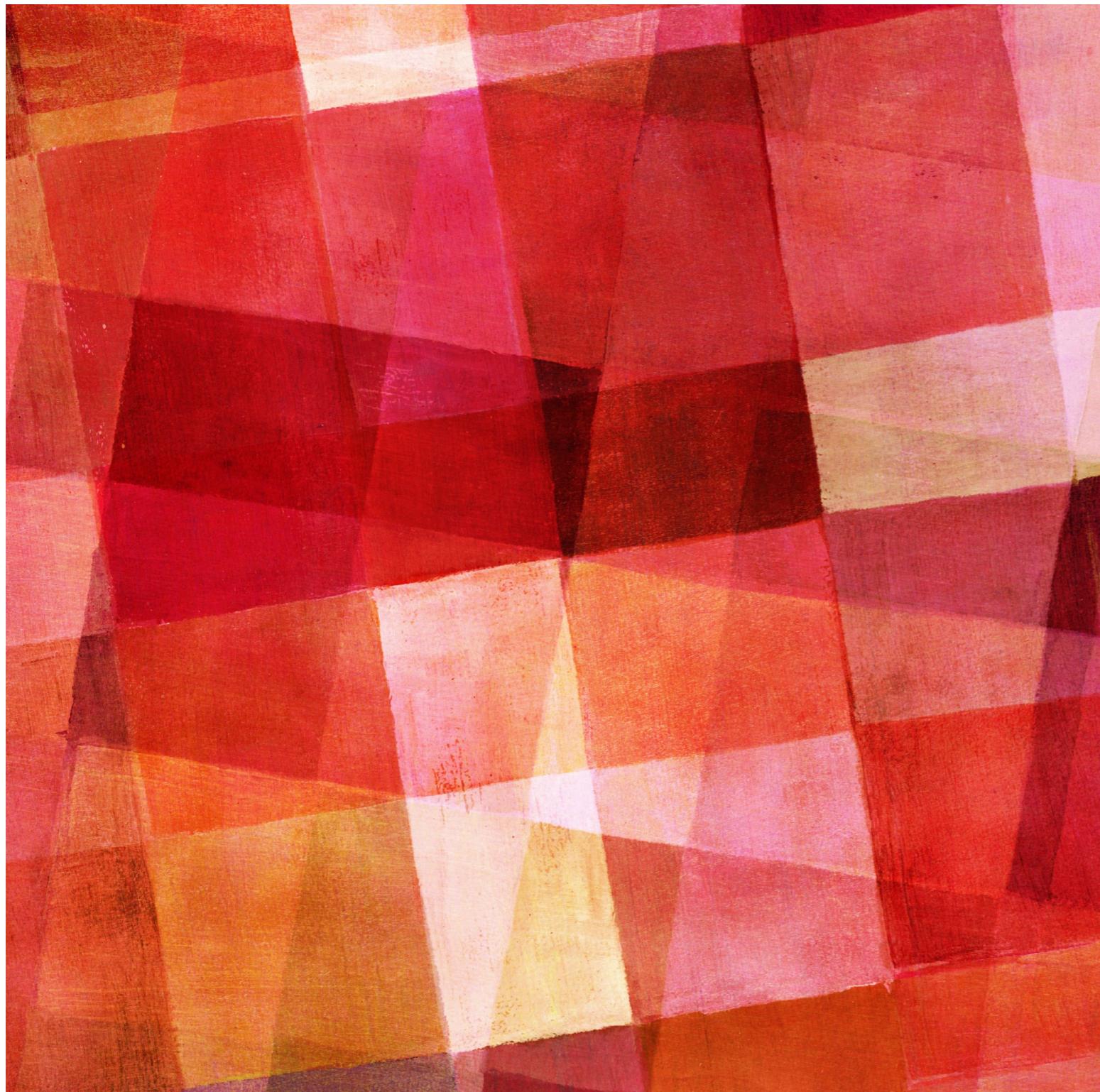


*Quiz*  
*Semantic tags*

# SEMANTIC TAGS

---

- Which tag will you use to enclose
  - The primary navigation menu for a site?
  - A newspaper report
  - A blog post
  - A part of a tutorial in your blog post
  - Copyright and terms and conditions of your site pages



*Web Storage*

# WEB STORAGE

---

- Need for maintaining state information between requests
- Cookies - document.cookie
- localStorage
- sessionStorage

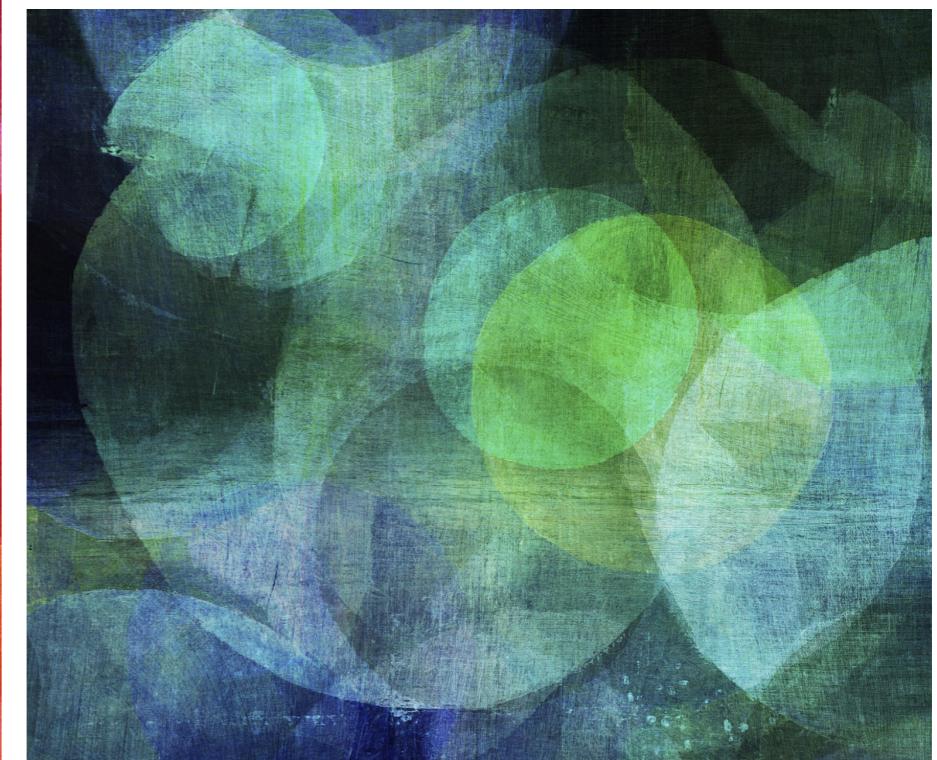
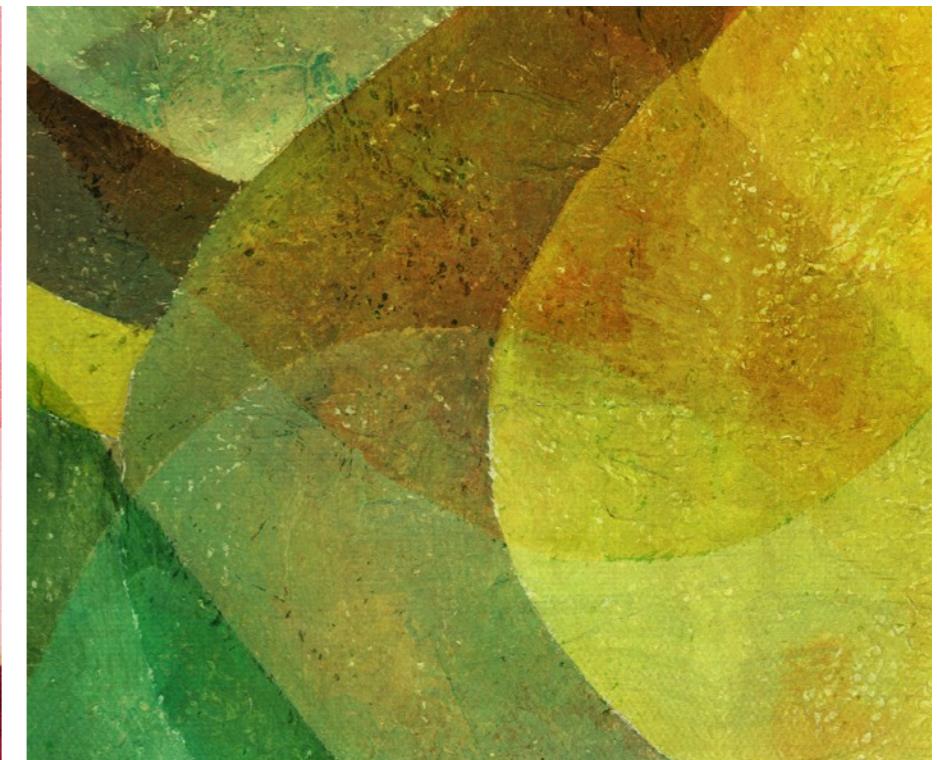
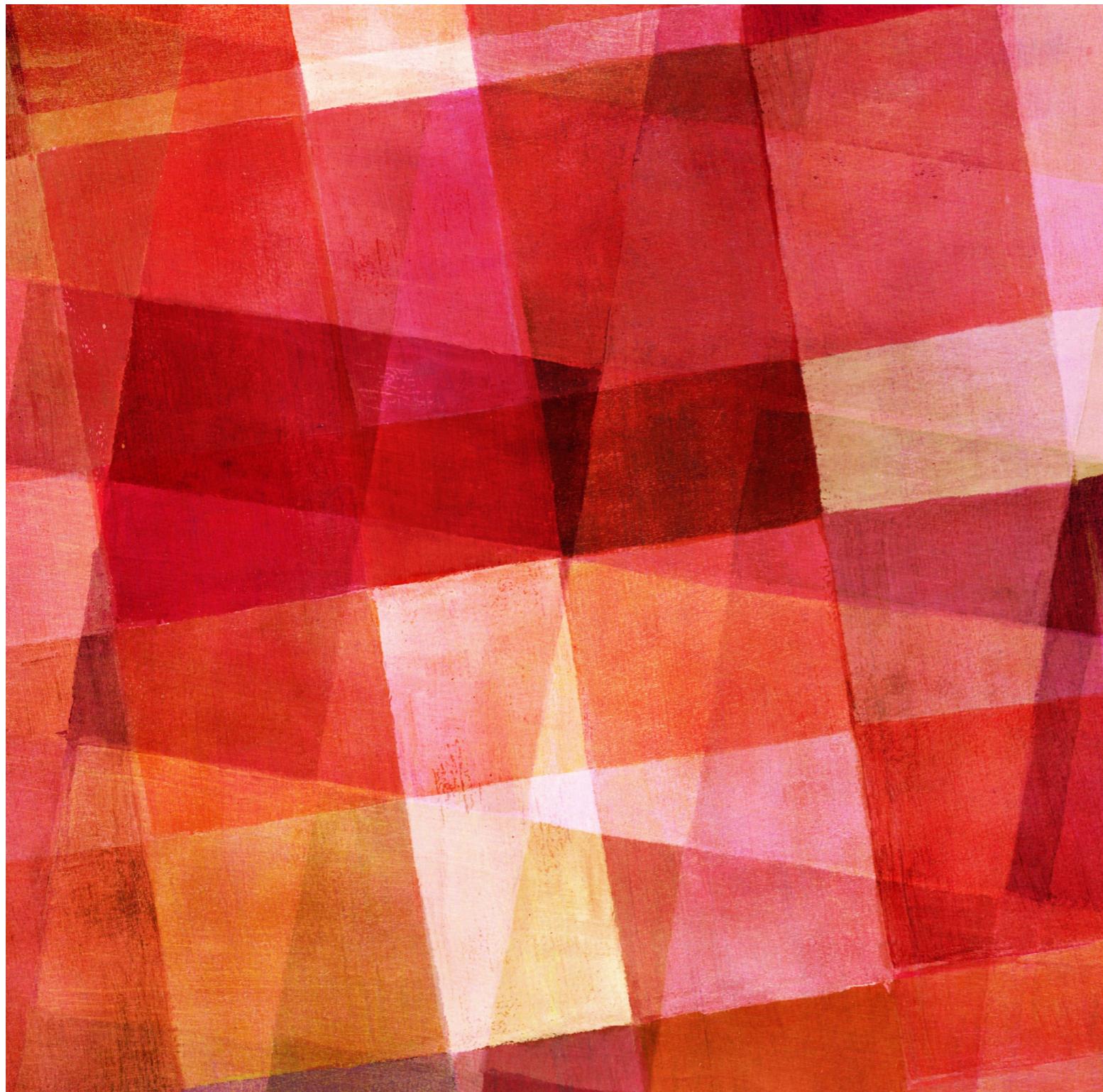


*Quiz*  
*Web Storage*

# WEB STORAGE

---

- How are cookies set by the server on a user's system? What do max-age and expires of a cookie do? Can a user disable setting up of cookies?
- What are third-party cookies?
- What is a Http only cookie?
- How is a cookie used for user authentication?
- What is the difference between local and session storage?
- How is an authorization token stored in local storage used for authentication?

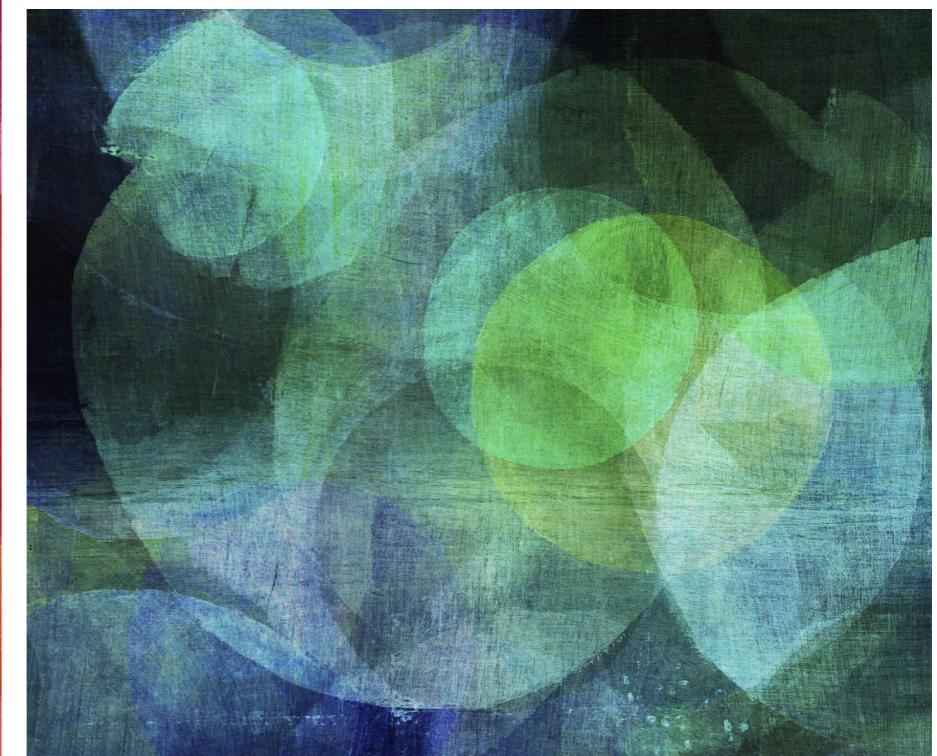
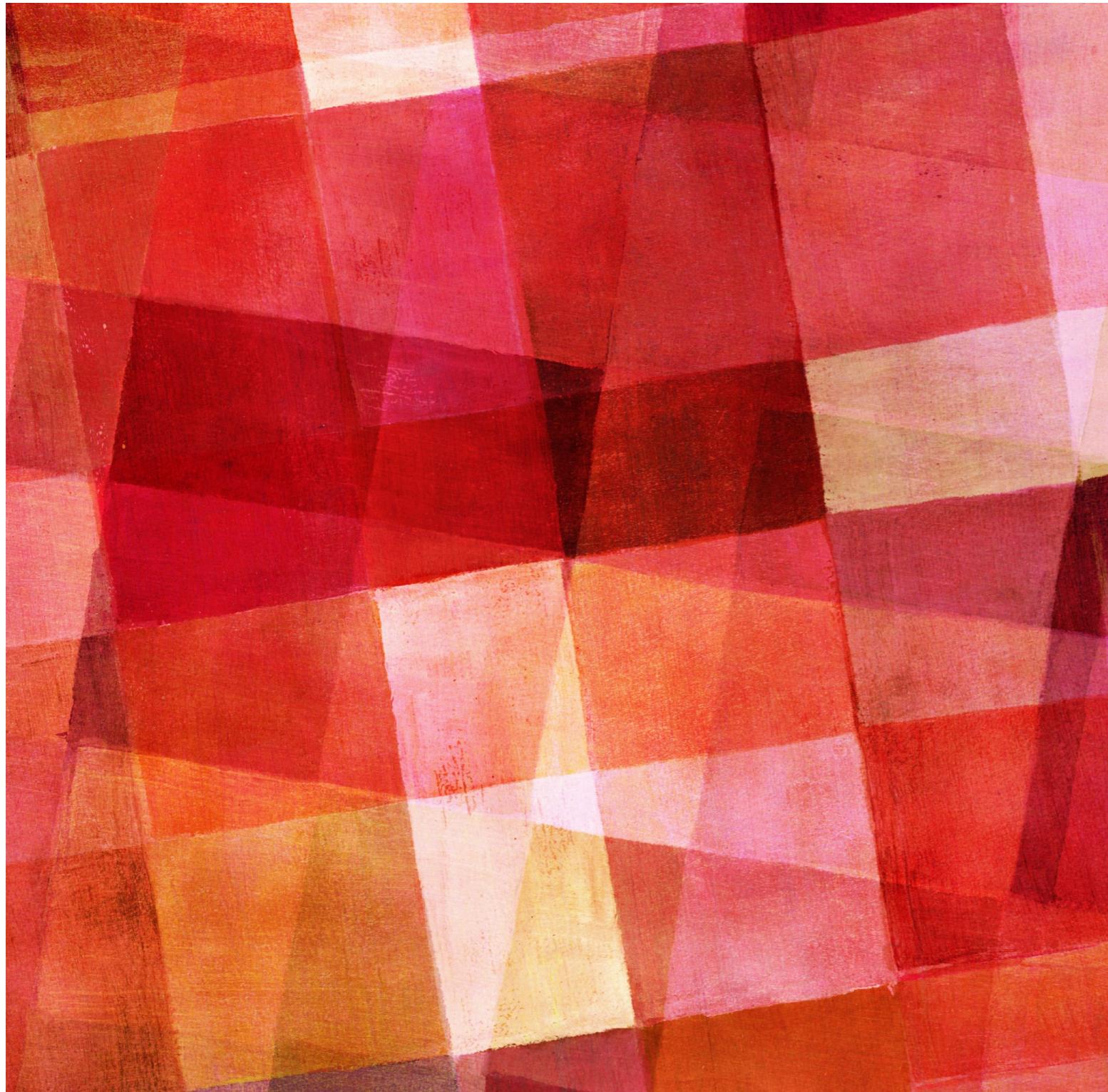


*Geolocation API*

# GEOLOCATION API

---

- `window.navigator.geolocation`
- `navigator.geolocation.getCurrentPosition`
- `navigator.geolocation.watchPosition`
- `navigator.geolocation.clearWatch`

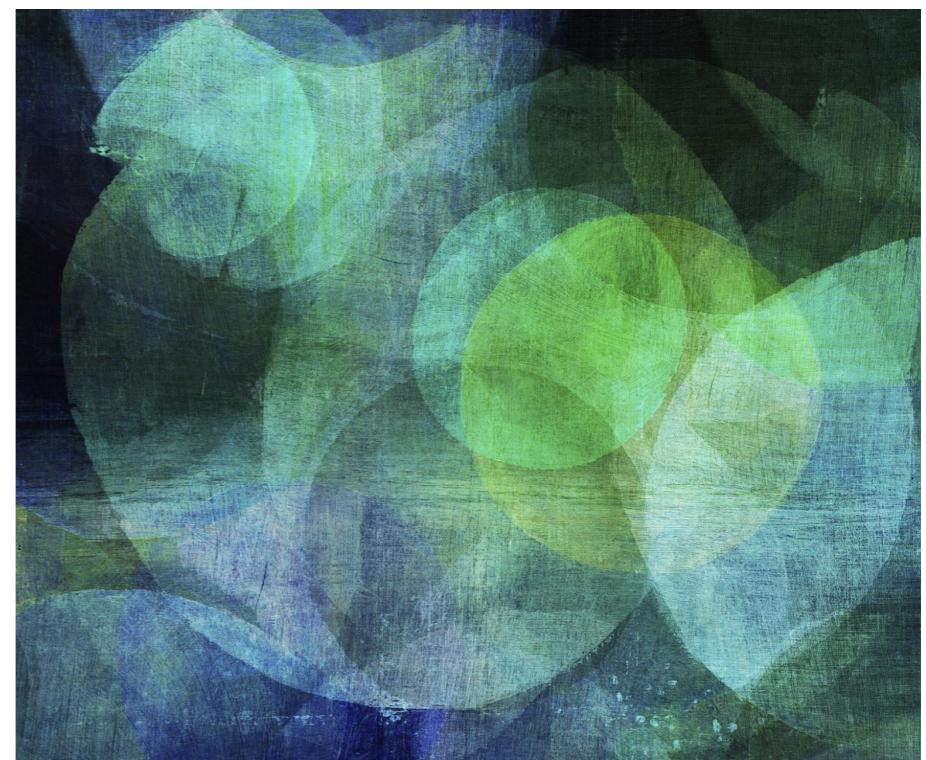
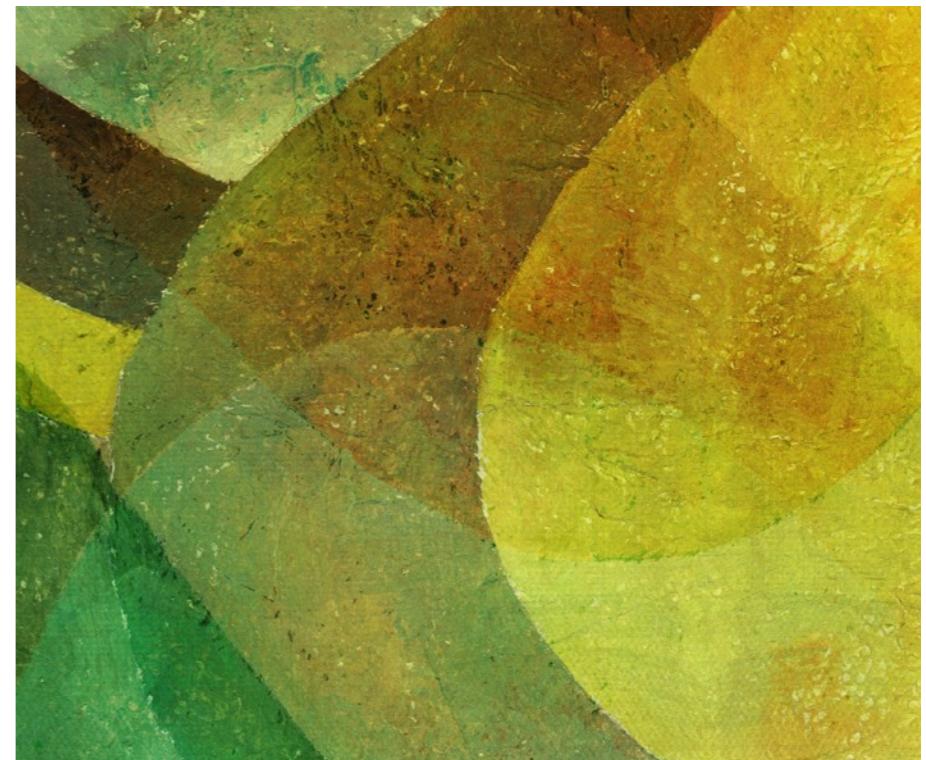
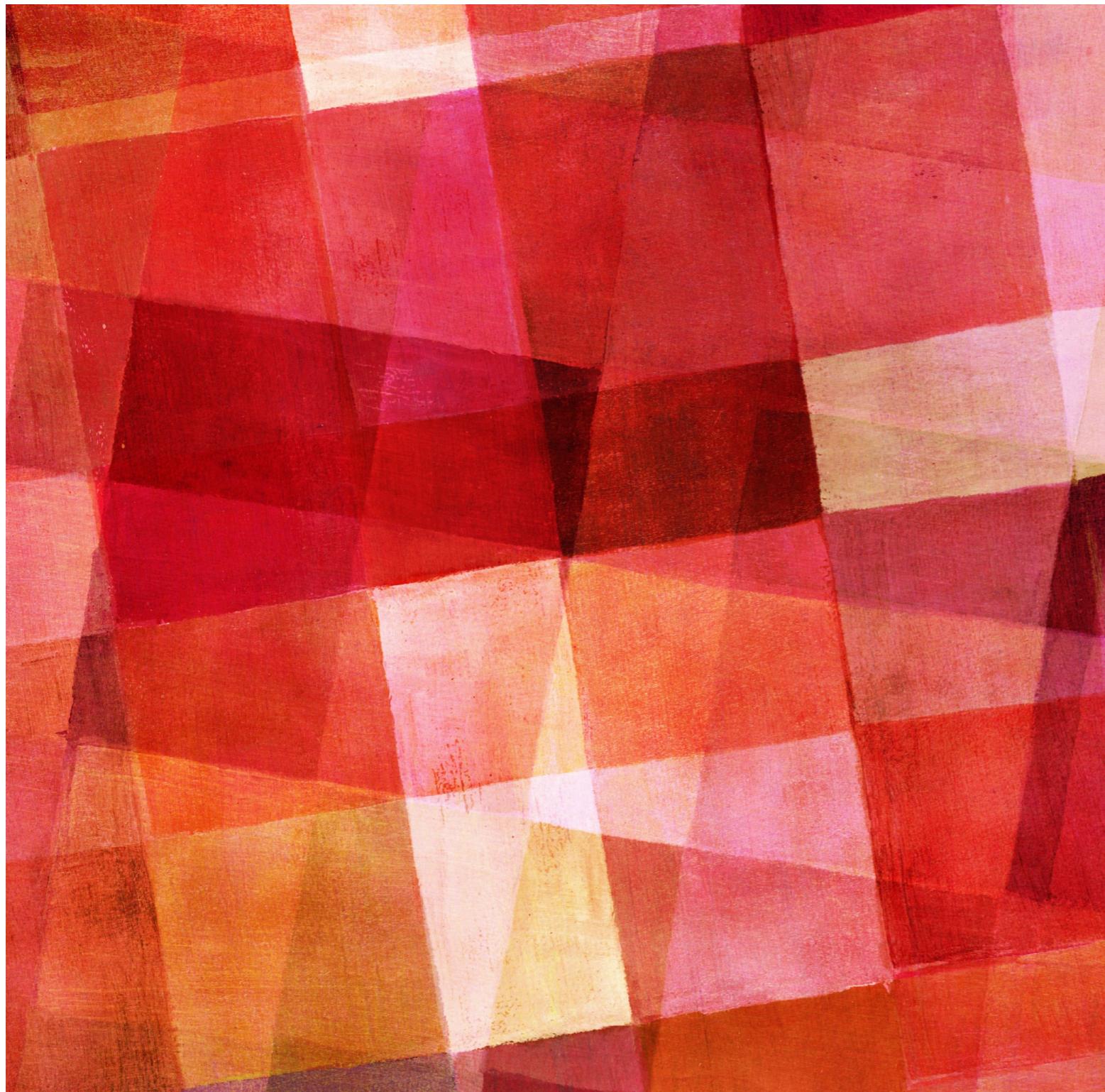


*Embedding Documents Using an Iframe*

# EMBEDDING DOCUMENTS USING AN IFRAME

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- iframe
- Using iframe as the target of a link
- Embedding a pdf in an iframe



*Including Social Media Widgets*

# INCLUDING SOCIAL MEDIA WIDGETS

---

- Twitter
- LinkedIn
- YouTube
- Quora

# REFERENCES

---

- Excellent material to begin with...  
*w3schools.com*  
<https://www.w3schools.com/>
  
- Once you get familiar with the basics and need in-depth information...  
*Mozilla Developer Network*  
<https://developer.mozilla.org/en-US/>

# ATTRIBUTIONS

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- Abstract blue background from Freepik  
[http://www.freepik.com/free-vector/abstract-blue-background\\_859016.htm](http://www.freepik.com/free-vector/abstract-blue-background_859016.htm)