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Exercise 5 - CSS, part II

Intro

In this exciting exercise, we will learn how to add cat pictures and color to the element's background (emphasis to cats). We will also show how to create more complex CSS selectors and how to add styles to specific state of the element (for example, when user mouseovers a link).

We will also go through some advanced CSS concepts of cascading and inheritance.

CSS element dimension

For light start, we will learn to how change dimension of an HTML element. We can define width and height in separate properties:

width

The **width** property sets the width of an element.

height

The **height** property sets the height of an element.

> The width and height properties do not include padding, borders, or margins; it sets the width or height of the area inside the padding, border, and margin of the element!

CSS background

The CSS background properties are used to define the background effects for elements.

background-color

The **background-color** property specifies the background color of an element.

The color is specified in one of these ways (same as text color):

- a color name — like "red"
- a HEX value — like "#ff0000"
- an RGB value — like "rgb(255,0,0)"

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This changes background color of whole page to red:

```
body {
     background-color: #ff0000;
}
```

In web development, <body> is the root element, and it is treated in CSS same as any other element — we can change its background, text color, etc. Properties set in **body** selector are applied to whole page (unless overridden by other selector).

When setting same CSS property multiple times on same element, only last one will be used!

background-image

The **background-image** property specifies an image to use as the background of an element. The image can be a graphic (e.g. PNG, SVG, JPG, GIF) or gradient.

The **url()** value allows you to provide a file path to any image, and it will show up as the background for that element. File path can be either a **relative** or an **absolute path**.

By default, the image is repeated so it covers the entire element.

```
.rock {
     background-image: url("images/paper.gif");
}
```

background-repeat

By default, the **background-image** property repeats an image both horizontally and vertically.

That is sometimes not what we wanted, and luckily for us, we can control if the image would be repeated only horizontally or only vertically, or not repeated at all.

The value **background-repeat: no-repeat;** shows the image only once.

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```
p {
      background-repeat: repeat;
      background-repeat: repeat-x;
      background-repeat: repeat-y;
      background-repeat: no-repeat;
}
```

background-position

The position of the image is specified by the **background-position** property. The **background-position** property sets the starting position of a background image.

It has three different types of values:

- Length values (e.g. 100px 5px)
- Percentages (e.g. 100% 5%)
- Keywords (e.g. top right)

Length values are pretty simple: the first value is the horizontal position, second value is the vertical position. So 100px 5px will move the image 100px to the right and five pixels down.

Percentages work a little differently. Instead of fixed number of pixels, image is moved percentage of container's width or height. For example, 50% means it will align the middle of the image with the middle of the container. 100% means it will align the last pixel of the image with the last pixel of the container.

Keywords are just shortcuts for percentages. These are the values that can be used:

- left top
- left center
- left bottom
- right top
- right center
- right bottom
- center top
- center center
- center bottom

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If you only specify one keyword, the other value will be "center".

By default, a background-image is placed at the top left corner of an element.

```
p {
     background-position: top center;
     background-position: 0% 50%;
     background-repeat: 50px 100px;
}
```

background-size

The **background-size** property specifies the size of the background images. These are the values that can be used:

- contain - Scales the image as large as possible without cropping or stretching the image.
- cover - Scales the image as large as possible without stretching the image. If the proportions of the image differ from the element, it is cropped either vertically or horizontally so that no empty space remains.
- auto - The background-image contains its width and height. This is the default value.
- <length> - Sets the width and height of the background image. The first value sets the width, the second value sets the height. If only one value is given, the second is set to "auto".
- <percentage> - Sets the width and height of the background image in percent of the parent element. The first value sets the width, the second value sets the height. If only one value is given, the second is set to "auto".

```
p {
     background-size: auto;
     background-size: cover;
     background-size: contain;
     background-size: 200px 200px;
     background-size: 50% 50%;
}
```

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background-attachment

The **background-attachment** property sets whether a background image is fixed or scrolls with the rest of the page.

```
p {
     background-attachment: fixed;
     background-attachment: scroll;
}
```

By default background scrolls with rest of the page.

CSS Borders

In previos exercise we talked in details about box model. We saw paddings and margins in action.
So last thing we are missing to complete the story are borders.

border-style

border-style property specifies what kind of border to display.

These are some values we can use:

- solid - Defines a solid border
- dotted - Defines a dotted border
- dashed - Defines a dashed border
- double - Defines a double border
- none - Defines no border

```
p {
     border-style: solid;
     border-style: none;
}
```

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border-width

The **border-width** property specifies the thickness of borders.

```
p {
      border-width: 5px;
}
```

border-color

The **border-color** property is used to set the color of the four borders.

Color values are specified the same way as text or background colors.

```
p {
      border-color: #000;
}
```

CSS Shorthand properties

background

To shorten the code, it is also possible to specify all the background properties in one single shorthand property. The shorthand property for background is **background.**

When using the shorthand property, the order of the property values must be:

- background-color
- background-image
- background-repeat
- background-attachment
- background-position

It does not matter if one of the property values is missing, as long as the other ones are in this order.

```
body {
   background: #ffffff url("img_tree.png") no-repeat right top;
}
```

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font

We can also use shorthand property to specify all the font properties in one declaration. The shorthand property for fonts is **font.**

The properties that can be set, are (in order):

- font-style
- font-weight
- font-size/line-height
- font-family

The font-size and font-family values are required. If one of the other values is missing, the default value will be inserted, if any.

```
p {
      font: italic bold 12px/30px Georgia, serif;
}
```

border

Borders also have its own shorthand property - **border**.

The properties can be set in this order:

- border-width
- border-style
- border-color

The border-style value is required.

```
p {
      border: 1px solid #ff0000;
}
```

There is no difference if shorthand or separate declarations are used. Use format you feel most comfortable with.

CSS pseudo-class

A **pseudo-class** is used to define a special state of an element.

For example, it can be used to:

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- Style an element when a user mouses over it
- Style visited and unvisited links differently
- Style an element when it gets focus

To write a pseudo-class, after normal selector add a state selector which begins with character **:** (eg. **:hover, :active, :visited**, etc.).

Mostly pseudo-classes are used for stylizing hyperlinks, but we can also use pseudo-classes to select specific element's child element (**:first-child, :last-child, :nth-child()**).

```
/* unvisited link */
a:link {
    color: #FF0000;
}

/* visited link */
a:visited {
    color: #00FF00;
}

/* mouse over link */
a:hover {
    color: #FF00FF;
}

/* selected link */
a:active {
    color: #0000FF;
}

/* every <p> element that is the 1st child of its parent */
p:first-child {
    color: #0000FF;
}

/* every <p> element that is the last child of its parent */
p:last-child {
    color: #0000FF;
}

/* every <p> element that is the 3rd child of its parent */
p:nth-child(3) {
    color: #0000FF;
}
```

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Exercise 1

(1) Let's start by creating a blank HTML document. Create a folder name **Exercise5-1.** You can create it on desktop, or your personal network folder.

(2) Download from Infoeduka SUPIT_Exercise_05-1-resources.zip file which contains all the resources we will use for this exercise. Extract image files to same folder as index.html (**Exercise5-1)**.

(3) Inside Exercise5-1 folder create a new text file **index.html**
If using Windows, make sure file extensions are not hidden and that document contains proper extension.
If extension is correct, when the file is double-clicked it will be opened in a web browser.

(4) Open index.html file with a **text editor** (for example: Choose to edit in Notepad++)
Basic editors can be used also, like Notepad, but more advance editors provide syntax auto-complete and coloring which makes writing HTML documents easier and more user-friendly.

(5) When inside text editor, copy **basic HTML document skeleton** into index.html file:

```
<!DOCTYPE html>
<html>
     <head>
          <meta charset="utf-8">
          <title>Exercise V</title>
     </head>
     <body>

     </body>
</html>
```

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After each step, preview the changes by opening index.html file in web browser refresh the browser window with opened index.html).

(6) Inside Exercise5-1 folder create a new folder **css**, and inside it text file **styles.css** If using Windows, make sure file extensions are not hidden and that document contains proper extension.

(6) Open styles.css file with a **text editor** (for example: Choose to edit in Notepad++).

(7) Let's add a few text paragraphs to **index.html** file:

```
<p class="cat1">
The cat (Felis catus) is a small carnivorous mammal.[1][2]
It is the only domesticated species in the family Felidae
and often referred to as the domestic cat to distinguish it
from wild members of the family.[4] The cat is either a
house cat or a farm cat, which are pets, or a feral cat,
which ranges freely and avoids human contact.[5] A house cat
is valued by humans for companionship and for its ability to
hunt rodents. About 60 cat breeds are recognized by various
cat registries.[
</p>
<p class="cat2">
The cat is similar in anatomy to the other felid species,
has a strong flexible body, quick reflexes, sharp teeth and
retractable claws adapted to killing small prey. Its night
vision and sense of smell are well developed. Cat
communication includes vocalizations like meowing, purring,
trilling, hissing, growling and grunting as well as cat-
specific body language. It is a solitary hunter, but a
social species. It can hear sounds too faint or too high in
frequency for human ears, such as those made by mice and
other small mammals. It is a predator that is most active at
dawn and dusk.[7] It secretes and perceives pheromones.
</p>
<p class="cat3">
Female domestic cats can have kittens from spring to late
autumn, with litter sizes ranging from two to five kittens.
[9] Domestic cats are bred and shown as registered pedigreed
cats, a hobby known as cat fancy. Failure to control
breeding of pet cats by spaying and neutering, as well as
abandonment of pets, resulted in large numbers of feral cats
worldwide, contributing to the extinction of entire bird
species, and evoking population control.
</p>
```

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Each paragraph has assigned a special class cat1, cat2 and cat3, and we will use those classes to add backgrounds to each paragraph.

(8) Let's make 1st paragraph light grey in background. Add the following class selector to **styles.css** file:

```
.cat1 {
    background-color: #eeeeee;
}
```

(9) To make our background be more observant, we will also add some padding to same paragraph. To make things more interesting, we will make more room on the left side:

```
.cat1 {
    background-color: #eeeeee;
    padding: 10px;
    padding-left: 200px;
}
```

(10)Last but not least, let's change the width of our container to be 50% of the page:

```
.cat1 {
    background-color: #eeeeee;
    padding: 10px;
    padding-left: 200px;
    width: 50%;
}
```

Notice that as we change browser size, the page width remains 50% of total page width.

(11) For our second paragraph, let's use an image for the background.

```
.cat2 {
    background-image: url("images/cat2.jpg");
}
```

(12) Similar to last paragraph, let's add some padding to the paragraph - but let's add bigger padding on the right side. And let's make it 50% of width.

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```
.cat2 {
    background-image: url("images/cat2.jpg");
    padding: 10px;
    padding-right: 200px;
    width: 50%;
}
```

(13) To end our second paragraph art, let's add some margins to the left side of the paragraph:

```
.cat2 {
    background-image: url("images/cat2.jpg");
    padding: 10px;
    padding-right: 200px;
    width: 50%;
    margin-left: 200px;
}
```

(14) For our last section, we will use same background image. Also we will, again, set width of the paragraph to 50% of the page, and add some paddings to the container:

```
.cat3 {
    background-image: url("images/cat2.jpg");
    width: 50%;
    padding: 10px;
    padding-left: 200px;
}
```

(15) BUT, that is not all! Because we don't want same 2 paragraphs, let's use other background CSS properties to make them a bit different. Because our background paws are in a big image, let's change its size using **background-size** property:

```
.cat3 {
    background-image: url("images/cat2.jpg");
    width: 50%;
    padding: 10px;
    padding-left: 200px;
    background-size: 100px;
}
```

(16) Notice how background image repeats itself on both x and y axes throughout whole paragraph. We can control that by adding **background-repeat** property:

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```
.cat3 {
    background-image: url("images/cat2.jpg");
    width: 50%;
    padding: 10px;
    padding-left: 200px;
    background-size: 100px;
    background-repeat: repeat;
}
```

Let's play around with it a bit! **Change the value** of background-repeat property to **repeat, repeat-x, repeat-y** and **no-repeat** to see how it behaves.

(17) Almost last, let's change background position. Add **background-position** property to the existing selector (leave background-repeat to no-repeat).

```
.cat3 {
    background-image: url("images/cat2.jpg");
    width: 50%;
    padding: 10px;
    padding-left: 200px;
    background-size: 100px;
    background-repeat: no-repeat;
    background-position: top left;
}
```

Try adding other values in background-position value, eg. **center center** and **bottom right**;

(18) Now let's change a bit values of **background-size** property. Change the value to **cover** and **contain** to see how it behaves, and change browser size to better notice the change in those property values.

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Exercise 2

In this exercise we will create the following page:

(1) Let's start by creating a blank HTML document. Create a folder name **Exercise5-2.** You can create it on desktop, or your personal network folder.

(2) Inside Exercise5-2 folder create a new text file **index.html**
If using Windows, make sure file extensions are not hidden and that document contains proper extension.

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If extension is correct, when the file is double-clicked it will be opened in a web browser.

(3) Open index.html file with a **text editor** (for example: Choose to edit in Notepad++)
Basic editors can be used also, like Notepad, but more advance editors provide syntax auto-complete and coloring which makes writing HTML documents easier and more user-friendly.

(4) When inside text editor, copy **basic HTML document skeleton** into index.html file:

```
<!DOCTYPE html>
<html>
     <head>
          <meta charset="utf-8">
          <title>Exercise V</title>
     </head>
     <body>

     </body>
</html>
```

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After each step, preview the changes by opening index.html file in web browser refresh the browser window with opened index.html).

(5) Inside Exercise5-2 folder create a new folder **css**, and inside it text file **styles.css**
If using Windows, make sure file extensions are not hidden and that document contains proper extension.

(6) Open styles.css file with a **text editor** (for example: Choose to edit in Notepad++).

(7) For start, let's include created css file to our index.html file. Add the include element to <head> element of **index.html**:

```
<link rel="stylesheet" href="css/styles.css" type="text/css"/>
```

Notice that href attribute contains relative path to the css file.

(8) Download from Infoeduka SUPIT_Exercise_05-2-resources.zip file which contains all the resources we will use for this exercise. Extract image files to same folder as index.html (**Exercise5-2)**.
Make sure your Exercise5-2 folder contains: **index.html**, **images** and **css** folders. And css folder contains **styles.css** file.
final-page.jpg also shows a preview of the page which we will create in this exercise.

(9) Our page will contain few blocks. To logically separate these blocks we will use elements. is a generic block element used for separation, just what we need here. This logical blocks will make possible it to create CSS selectors and assign correct styles to these blocks, and their elements.
First block is the header. So let's create a element and give him class value header. We will use this class to define its special styles in following steps.
Add the following element to <body> element in **index.html** file:

```
    <div class="header">

    </div>
```

(10) Now we need to add the header element. Let's use our favorite <h1> element.
Your header element should look like this now:

```
    <div class="header">
        <h1>Cats 101</h1>
    </div>
```

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(11) Now that we got styling materials, let's get to it!
First thing we will do is change font on the whole page. As we saw in inheritance chapter above, some styles we define in page <body> or <html> element, will be used on whole page (unless overridden in later selectors). font-family is one of those.
Inside **styles.css** change font-family like this:

```
body {
    font-family: Courier;
    margin: 0;
}
```

By default <body> has a small margin, which we don't need for this page, so we have also removed body margins by putting its value to 0.
Notice that for value of zero pixels, we can write just 0, which is the same as we wrote 0px.

(12) Meanwhile in header-land. To add background in image, background-image property is used. Its value uses **url()** parameter, which contains a file path to the image which will be used as background.
Let's use image stars.jpg.
The path value inside **url()** parameter should be either inside single or double quote symbols (' or ").

```
.header {
    background-image: url('../images/stars.jpg');
}
```

Notice that background image is repeated in all directions by default.

(13) To make header section larger, we can use **padding** property. As background is set inside borders of the elements, setting padding value will make our background area larger.
As we see in final image, padding on top is bigger than bottom padding. Let's use 100px for top padding and 50px for bottom. Add following declarations to **.header** class:

```
    padding-top: 100px;
    padding-bottom: 50px;
```

(14) To make the white box around <h1> element, we again need to set background color to white, and add padding to make the box larger. We can also center align the content, and transform all text into uppercase letters.

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For selector, we can learn how to make an itsy-bitsy more complex selector. After any selector (A) we can write another selector (B) separated by space. That will target all child elements which correspond to selector B inside elements targeted by selector A. That sound complicated, but here is an example to make it more clear. For example, this selector targets all <h1> elements inside elements with **.header** class.

```
.header h1 {
    background-color: #fff;
    padding: 20px 50px;
    text-align: center;
    text-transform: uppercase;
}
```

Add previous block to **styles.css** file.

(15) To make <h1> less wide, we need to set **width** property. As <h1> is a block element by default his width is full width of his parent elements (which is full browser width).

```
    width: 300px;
```

When we change width of the element, content will be center aligned inside his box (which is now 300px), but not on the page.
To center align an element on the page, we need to use **margins**, as we need to change the area outside the box border.
Add following lines to **.header h1** selector.

```
    margin-left: auto;
    margin-right: auto;
```

(16) Last thing here, let's add the think black borders to both white box, and starred box. We'll do that will **border** property.
Add following property to both **.header** and **.header h1** selectors:

```
    border: 1px solid #000;
```

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(17) These two selectors should look like this:

```
.header {
    background-image: url('../images/stars.jpg');
    padding-top: 100px;
    padding-bottom: 50px;
    border: 1px solid #000;
}

.header h1 {
    background-color: #fff;
    padding: 20px 50px;
    text-align: center;
    text-transform: uppercase;
    width: 300px;
    margin-left: auto;
    margin-right: auto;
    border: 1px solid #000;
}
```

(18) Time to do the second part. For this block, we will add another logical selector element with a class attribute. Inside the , we will add <h1> and <p> element with content.

```
<div class="cats">
    <h1>Meows</h1>
    <p>
The domestic cat (Felis silvestris catus or Felis catus) is
a small, typically furry, carnivorous mammal. They are
often called house cats when kept as indoor pets or simply
cats when there is no need to distinguish them from other
felids and felines.[6] Cats are often valued by humans for
companionship and for their ability to hunt vermin. There
are more than 70 cat breeds, though different associations
proclaim different numbers according to their standards.
    </p>
</div>
```

(19) We will start with adding kitties to the background, and give the container a bit more padding. Create a selector inside **styles.css**:

```
.cats {
    padding: 70px;
    background-image: url('../images/kitty.png');
}
```

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Kitten attack! If you take a look at final page image, you will see that we are ok with image being repeated horizontally (on x axis), but not vertically (on y axis). We can control that with background-repeat property:

```
    background-repeat: repeat-x;
```

(20) Almost there. We need kittens on the bottom of the element, not the top. To do that, let's add background-position property:

```
    background-position: bottom center;
```

(21) Next we need to repeat what we done in one of previous steps with Cats title with both <h1> and <p> elements in this section.
Let's set left and right margin, background-color and text color in class .cats-column, and add this class to both elements inside HTML file.
We will also create a separate class for each element to set its width.
Add following CSS selector:

```
.cats-colums {
    background-color: black;
    color: white;
}
```

Add **.cats-columns** class on both elements inside HTML file, and also **.cats-header** to h1 and **.cats-text** class to paragraph where we will create styles for each separate element.

```
<div class="cats">
    <h1 class="cats-colums cats-header">Meows</h1>
    <p class="cats-colums cats-text">
      …
    </p>
</div>
```

(22) Along with width, in each element's class we will define text-alignment (center or justified) and paddings. <h1> also needs to be uppercased.
Let's add those classes:

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```
.cats-header {
    text-align: center;
    width: 300px;
    padding: 10px;
}
.cats-text {
    width: 400px;
    text-align: justify;
    padding: 15px;
}
```

(23) Cat in a box next! To set the cat image, we will use background-image property once more. But besides that this element has no other content.
That is why we will create just an empty element and define its class attribute:

```
        <div class="separator"></div>
```

(24) Everything else will be done with CSS magic powers! Next, background!

```
.separator {
    background-image: url('../images/box.jpg');
}
```

(25) Where is Waldo.. the cat? is a block element, and his **width** is defined by parent's element width. But his **heigh** is determined automatically by his content (by default it is set **height: auto;**). As the element is empty (without content), his height is 0.

```
     height: 300px;
```

We can change that by defining **height** property inside **.separator** class.

(26) We can also learn 2 other cool properties for backgrounds. background-size can change size of background image. It can contain width and height value in pixels, but also one of special values. For this example, we can use **background-size: cover**

```
     background-size: cover;
```

declaration. That will stretch the image in width so that image does not repeat itself in any direction.

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(27) By default image scrolls as user scrolls the page. But with **background-attachment**, we can change that to make image remain fixed on the page, and create a cuteness overload effect with it.

```
    background-attachment: fixed;
```

Aww…

(28) Last section is the link section. Let's create another element with two links. We will give each link his special class value.

```
        <div class="links">
            | <a href="https://en.wikipedia.org/wiki/Cat"
class="link-one">This is a link</a>
            | <a href="https://en.wikipedia.org/wiki/Cat"
class="link-too">This too</a>
        </div>
```

(29) To center align the links, as is a block element, and his box width is determined by his parent's width (full browser width in our case), we can use text-align as we are aligning content inside the box:

```
.links {
    text-align: center;
}
```

(30) To remove text underline from the links, we need to set text-decoration property for both links. We can do that with complex selector we learned today:

```
.links a {
    text-decoration: none;
}
```

This selects all <a> elements inside elements with class .links.

(31) Now we need to stylize the links. First link has bigger font-size and bold letters.

```
.link-one {
    font-size: 30px;
    font-weight: bold;
}
```

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(32) Second link has white text color, black background-color and a small padding on each side to make his box bigger in size.

```
.link-too {
    background-color: black;
    color: white;
    padding: 10px 20px;
}
```

(33) And finally, time for pseudo-classes!

With **:hover** we can stylize the state when user mouse-over an element. That is mostly used for links.

Let's change link **color**, and second links **background-color** on **:hover**. To do that we need to create a normal selector for the button, and add **:hover** on end.

Notice that there is no space between selector and **:hover** string.

```
.link-one:hover {
    color: gray;
}
.link-too:hover {
    background-color: gray;
    color: black;
}
```

(34) The end! Meow!