Second Mandatory Assignment in Front-end Development

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Introduction

This document is part of the second mandatory assignment in the course Front-end Development held in Spring 2016 at BAAA - Business Academy Aarhus.

- This source code can be found on GitHub at https://github.com/simsoll/frontend-second-assignment/tree/handover
- The website can be found online at Heroku at https://squares-beta.herokuapp.com/

Case description

Squares is a digital gallery for new art, where gallery visitors can fashion and create the final expression of the art pieces.

On Squares artists create new artworks that are divided into small digital pieces that visitors can play around with and put together via a digital interface. Squares is an open art playground where you can purchase printed versions of the artists' works reworked into your particular personal design.

Squares will be a global, user-driven and interactive gallery where people from around the globe can dive into the artworks and create works that fit their expression and experience. At the same time Squares is a fascinating and imaginative business concept that attracts artists, both because, of the initial challenge to their creativity, and because they can sell and profit from their work.

Squares is a new project lunched by Kong Orange. Kong Orange is a freelance-based development bureau specialising in digital entertainment across multiple platforms (kongorange.com/)

User Persona

Julie 23, single, studying Media Science, lives in Aarhus, wants to live in Copenhagen, Northside-fan, listens to P6 Beat (indie cool), changes for P3 (mainstream), when alone.

Loves Instagram, just began on Snapchat, reads Danish fashion blogs, reads eb.dk for news, Zulu & DR3 as flow tv, has iPhone 5s, watches House of Cards, because people say it's cool, watches Game of Thrones, because she loves it & read all of the Harry Potter books.

Designer Persona

Peter 28, single, graduate from London School of Arts as Illustrator, lives in New York, illustrated his first children's book, been at Hummel as tshirt print designer, pursuing career as professional street artist. Got prints chosen on Threadless.com, has his own webshop with t-shirts he sell through Spreadshirt.

Design requirements

Create a Style Guide for the public website to Squares. The Style Guide must include:

- Target group description based on the personas acquired by Kong Orange. Comment on the personas and the target group they hint at. What values do they possess etc.?
- A colour palette with examples of colours and an explanation of your choices.
- Your choice of Font and an explanation of your choices.
- A Gestalt sketch and description of composition. Explain why you chose to organise your site in this particular way, knowing what you do about users and functionality.
- Explain how your design choices supports the sites content.

Technical requirements

You have to utilize technologies from the front end course: HTML5, CSS3, CSS preprocessor (i.e. Sass) and JavaScript. Using jQuery and jQuery plugins is voluntary and you are allowed to use a CSS framework like Bootstrap. It is also voluntary to use automation tools like ex Gulp. You are allowed to use JavaScript frameworks like AngularJS.

In the report, you must document and explain how the following elements are used in your solution:

- Semantic HTML
- CSS3 and use of CSS preprocessor
- Central JavaScript algorithms
- Possible use of CSS framework
- Possible use of jQuery and arguments for use of possible plugins
- Possible use of JavaScript framework, i.e. AngularJS
- Possible use of automation tools, i.e. Gulp
- Browser compatibility
- Validation of HTML and CSS

SQUARES

This section will shortly describe how the SQUARES business case is interpreted and how it will be supported by the website.

Everyone will be able to upload square sets to SQUARES - the only requirement is that you need to be logged in, as square sets are uploaded through the profile page and every square set will be linked to a user account. The poorly designed square sets will be filtered out using a rating system. For this prototype the rating system will be rather simple, but will ensure that the highest rated square sets and artworks will be shown first. Square sets can contain between 5 and 25 square pieces.

The users of SQUARES will be incentivized to upload quality looking square sets, as this is the way people can make a profit on SQUARES. Whenever someone buys a product in the shop (a poster, t-shirt, physical cardboard pieces, etc.) with one of the artworks on SQUARES, the money left after covering expenses will be distributed between SQUARES and the user that created the underlying the square set. It doesn't make sense to give any contributions to the creator of the artwork, as it's easy on SQUARES to create artworks based on already completed artworks, so the artwork gallery will likely be floated with copies of high quality artworks.

The shop will not be implemented in this prototype, but the idea is to have a shop where its transparent what the square set creator will earn on the purchase. Furthermore, donations to the square set creator should also be possible through the shop by letting the buyer choose the price (a minimum price, a maximum price and a suggested price should be predefined for each product). This could also incentivize new designers to upload square sets as their earning potential is visible. This type of shop can for instance be found on https://leanpub.com.

Target group

Taking the user persona into account the user target group consists of people that want to signal to their surroundings that they are cool and up-to-date with the newest trends, but inside are struggling to find their own true individuality. They know how to handle a smart-phone but are still considered to be non-technical people.

Looking at the designer persona this part of the overall user group is quite different from the other target segment described by the user persona and discussed above. They tend to be a bit more mature and business-minded, as they are not on a pursuit for finding their own individuality (they have found it), but are looking for something that can help them succeed with the career ambitions. They are discerning, as they easily can distinguish a well thought-out product from a poorly designed product. Additionally, they are considered professionals within their field of work.

To support these personas the design should be simple and intuitive so non-technical people can navigate the website and it should be easy to find square sets and produce artworks that the user envision. Furthermore, the website should accommodate the picky designer that has a sense of what good design is.

Style Guide

The style guide presented here will cover the main design choices for the website. The overall theme will be to use squares in the design thereby supporting both the title of the website but also the business concept - combining squares to produce artworks.

Color Scheme

To support SQUARE's creative environment a monochromatic purple color scheme has been chosen.

The purple color combines the stability of the blue and the energy of the red color, creating a color of the imagination allowing the user to get in touch with his/her deeper thoughts. It's a creative color, which is well suited for the purpose of the website.

As the purple color is a rather feminine color, the color scheme is mainly applied to the navigation bar and on call-to-action elements such as the buttons. This is done to also embrace the male visitors and for the same reason the chosen purple colors are more blue than red.

The color scheme can be seen below in figure 1 and online by following the link http://paletton.com/#uid=1480f0klIH05sZKf6RGrEvAtHj8.

Figure 1: The chosen color scheme

Typeface

The SQUARES website uses the Open Sans typeface, which is a humanist sans-serif typeface. The site is not heavy on text, but the places where readability is important Open Sans is a good choice, as it's easily readable even in small sizes and it works well on both web and mobile.

Gestalt principles

To support the personas and their goals visiting the website, it needs to be intuitive and easy to navigate. For this to work the main Gestalt principle used are similarity in the use of square shapes.

Figure 2: Hierarchy of text elements

Front page

Figure 3 is showing a Gestalt sketch of the front page, which has been marked with two points of interest

1. Similarity: The squares logo and the call-to-action buttons all share the same form and color - a purple square. This is used throughout the website and will make it easy for the user to identify important elements.
2. Proximity: The buttons are situated close to each other indicating that they are somehow related. These buttons are three distinct ways for the user to start investigating what the site has to offer and thereby helps the user from the front page to other pages of interest.

Square Sets and Artworks page

Figure 4 is showing a Gestalt sketch of the square sets page, which has been marked with two points of interest, but are both related to the similarity principle. Again, the theme is characterized by square forms.

The artworks page is not shown here, as it has the exact same structure as the square sets page. This also makes it easier for the user, as the same structures and rules apply on the different pages.

1

Welcome to SQUARES

We believe in the power of your individuality
We enable people with a desire to express their individuality to work together with digital designers to build that individuality.

Want to express your individuality?
Customize real designers work to fit your own individuality

1

2

| Browse square sets | Create your own artworks | Get inspired by others |
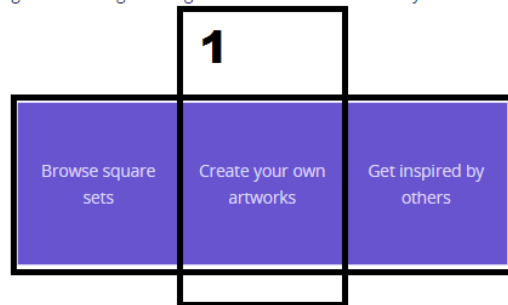
Are you a digital designer?
Make users identify themselves through your designs and make a profit from your work
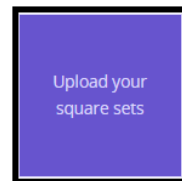
1

Upload your square sets
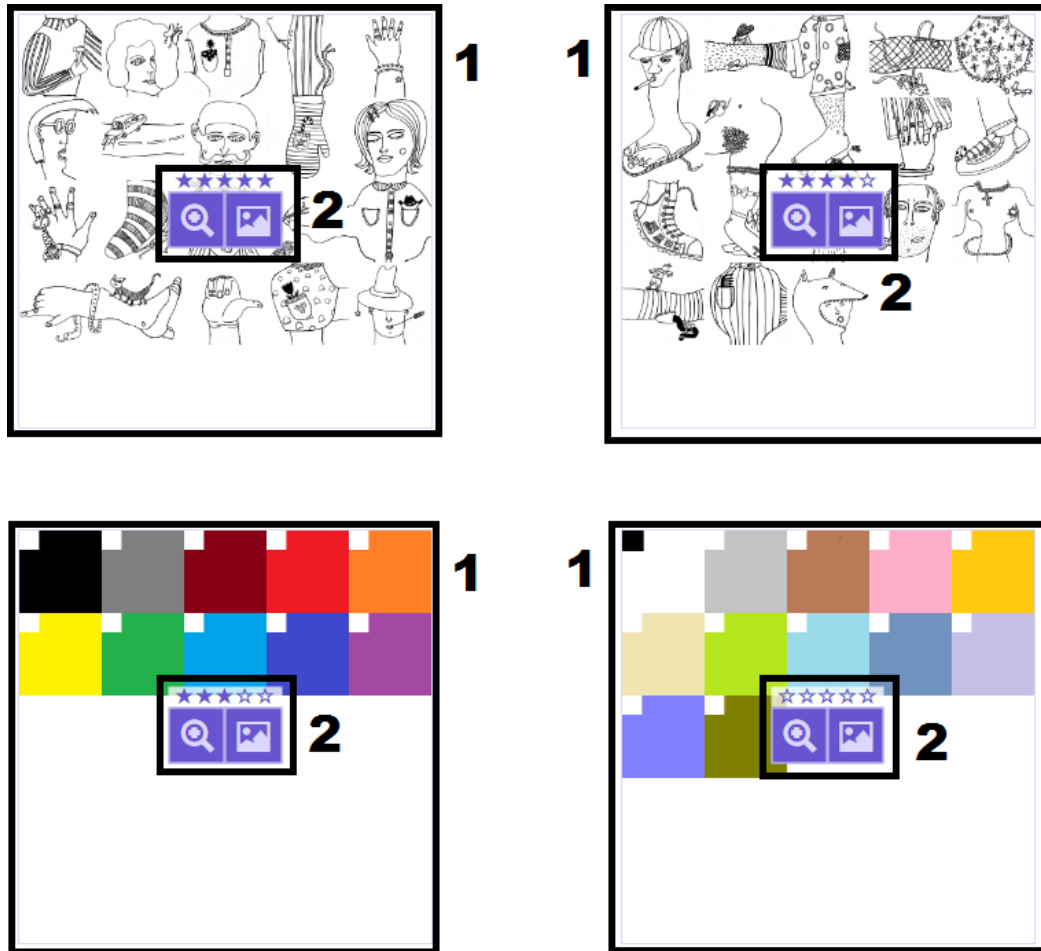
Figure 3: Gestalt sketch of the front page

Figure 4: Gestalt sketch of the Square Sets page
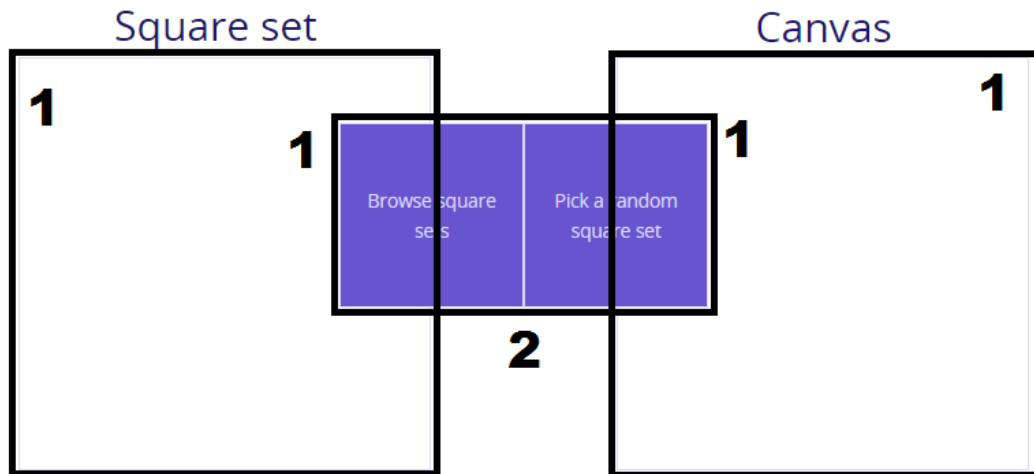
Canvas page

Figure 5: Gestalt sketch of the Canvas page

1. Similarity: Squared elements are again a theme on this page, as it has been for the other pages.

2. Proximity: The two buttons in the middle of the page are close to each other and share a common purpose - to have the user pick a square set, before he/she can start working on the canvas.

Figure 5 is showing a Gestalt sketch of the canvas page, which has been marked with two points of interest

About page

Figure 6 is showing a Gestalt sketch of the about page, which has been marked with a single point of interest showing the SQUARES logo, which is also placed on the front page.

The remaining pages

Both the profile and administration pages are using the same Gestalt principles as mentioned above, as they are just compositions of square sets, artworks and buttons, which already have been discussed. The only things remaining are the form elements on the user administration page, sign up page and login page, which are not interesting in this discussing.
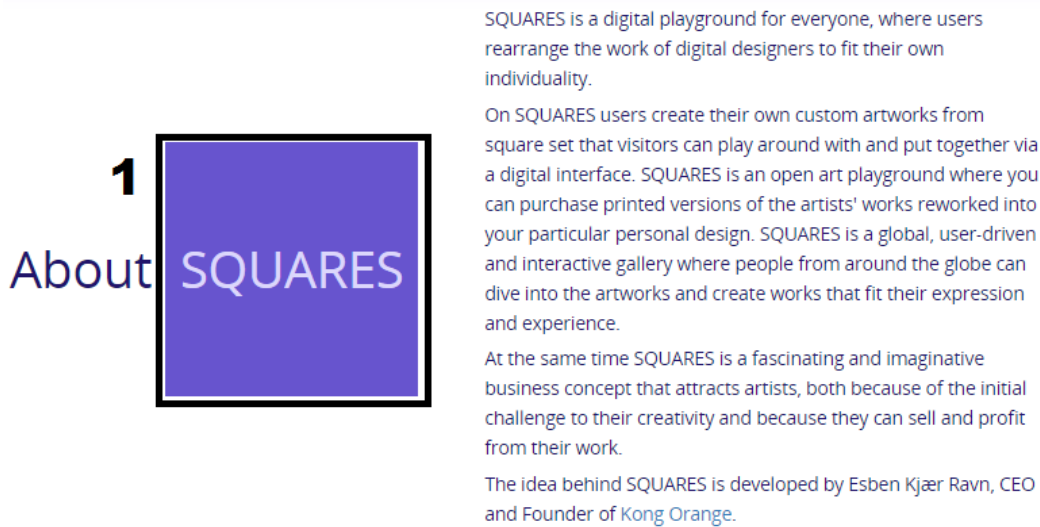
SQUARES is a digital playground for everyone, where users rearrange the work of digital designers to fit their own individuality.

On SQUARES users create their own custom artworks from square set that visitors can play around with and put together via a digital interface. SQUARES is an open art playground where you can purchase printed versions of the artists' works reworked into your particular personal design. SQUARES is a global, user-driven and interactive gallery where people from around the globe can dive into the artworks and create works that fit their expression and experience.

At the same time SQUARES is a fascinating and imaginative business concept that attracts artists, both because of the initial challenge to their creativity and because they can sell and profit from their work.

The idea behind SQUARES is developed by Esben Kjær Ravn, CEO and Founder of Kong Orange.

Figure 6: Gestalt sketch of the About page

Technical Considerations

The front-end part of the website is build using the JavaScript framework AngularJS together with the CSS framework Bootstrap, both helping speeding up the development process on the SQUARES prototype.

NodeJS is used as a simple back-end web server, where user information, square sets and artworks are stored. There is no real database behind the SQUARES prototype, as data is stored in back-end services, which are reset whenever the web server is restarted. However, having these back-end services simplifies many of the application workflows as no data needs to be stored in the front-end - user information, square sets and artworks are just retrieved from the back-end using HTTP GET request whenever needed.

Besides a standard CSS reset style sheet the styling is developed using Sass. The Sass files are complied to CSS files using a Gulp task ensuring that the Sass files is recompiled when any changes are made to the Sass files.

Frameworks

As mentioned above the SQUARES prototype uses both a CSS framework and a JavaScript framework to simplify some of the development tasks thereby greatly shortening the development time. Bootstrap and AngularJS have been taught during the course, so these frameworks have been used developing the SQUARES prototype.

Bootstrap

Bootstrap is used to define the layout of the pages on the website using the Bootstrap 12-column grid system. Furthermore, Bootstrap is used in styling the navigation bar and the form elements and comes with a set of glyph-icons also used on the website.

The CSS framework is good for fast prototyping, as it makes some of the styling tasks faster to implement as the framework comes with a lot of pre-made CSS classes. However, going forward with the SQUARES prototype it should be considered to stop using Bootstrap, as it's a heavy framework (+400KB for the non-minified version used in this project) and it would make sense to style the website with custom-made CSS creating a unique look and feel.

AngularJS

Along with Boostrap the website uses the JavaScript framework AngularJS. The SQUARES prototype uses AngularJS version 1.5.X introducing components and these are heavily used in the prototype. These components are special types of directives, which easily binds templates and controllers together forming encapsulated HTML elements resulting in expressive mark-up. AngularJS components forms intuitive communication flows between components using clear component interfaces, one-way binding, callbacks to component events, lifecycle hooks, etc. Each page is then implemented using one or more components.

As sharing square sets and artworks through social media will likely be necessary for SQUARES to become succesful, the routing capabilities will be important having each part of the website identified by a unique URL. This is done through the ngComponentRouter module, which makes it possible to route paths to relevant page components.

Libraries

The SQUARES prototype uses a few external libraries to simplify some of the complex challenges.

Canvas

The canvas page is developed using the library InteractJS, which comes with many interesting features out-of-the-box including drag and drop, event callbacks and grid-snapping. Furthermore, the library has excellent documentation.

One alternative to InteractJS is to use AngularJS directives simulating drap and drop functionality by hooking into mouse-down, mouse-up and mouse-over events, but is still rather limitied compared to what InteractJS has to offer.

Another alternative is called codef0rmer, which makes jQuery-like drag and drop easy in AngularJS. Still, the lack of key features such as grid-snapping is the reason InteractJS is used in the SQUARES prototype.

State compression

As previous stated, sharing through social media can become quite important for SQUARES going forward. To support this even further a prototype for a canvas state-generator has been included in the SQUARES website. This state-generator makes it possible to share a canvas without creating a user on SQUARES and save the progress as an artwork. A unique URL can instead be generated, which contains the current state of the canvas - much like the functionality available on http://paletton.com/ - and can therefore be shared with everyone.

This is done by having the canvas state represented as a JSON object, which then can be serialized (using the JSON.stringify function) and then encoded to greatly reduce the length of the stringified JSON object. The encoding could be accomplished using the btoa base64 encoding function (the decoding function is called atob), which is part of the HTML5 specification. However, a library called lz-string is used instead as it's both a lot faster than the btoa/atob functions and the length of the encoded string is also greatly reduced compared to the base64 encoding.

When the generated URL is entered in the browser the encoded state is part of the query string. This encoded state string is then decoded using lz-string and then parsed into a JSON object using JSON.parse, which is loaded into the canvas component.

The implementation in SQUARES is still sub-optimal as the generated URL is quite long, but there are plenty of opportunities to compress the canvas state even further thereby reducing the URL length.

This feature has a useful side effect as the canvas state can be stored along with each artwork, whenever an artwork is saved by a user on SQUARES. When browsing through the art gallery users can then pick whatever artwork they like and load the stored state directly into the canvas starting where the creator of the art saved his work.

HTML to image

Whenever a user want to save his/her work on the Canvas page, the artwork is transformed to an image and stored on the back-end server. For this to work the library called html2canvas is used on the website, which can convert an HTML element and all its child elements into a canvas. From their the HTMLCanvasElement.toDataURL() method, which is part of the HTML5 specification, can be used to transform the canvas into a data URI containing an representation of the canvas image.

This way of saving the artwork put some limitations on how the Canvas page mark-up should be structured. For instance, the square set pieces needs to be child elements of the artwork frame. It could be beneficial to use a library, which takes a screenshot of the page instead based on a position, width and height, but this needs more investigation before a change can be made to the implementation.

Square set upload

Instead of relying on the native HTML input file type to handle upload of square sets ng-flow is used, which is a HTML5 file upload extension specifically to the AngularJS framework.

This extension comes with a few interesting features, such as pause/resume uploads, folder upload and upload progress, but also enables a fast implementaion with only a minimum of mark-up and JavaScript to be specified for the extension to work.

Future improvements

The mobile experience on the SQUARES prototype could be improved significantly. Due to a smaller screen size on mobile devices it can be cumbersome to effectively use the Canvas page in it's current form. This is because the distance between the top of the artwork frame and the bottom of the square set is greater than the height of the majority of mobile devices. To improve on this a carousel-like library called Swiper has been consider. However, implementing this library will be a bit involved, as with Swiper and InteractJS uses the CSS transform property to manipulate an items position. This means that whenever the user interacts with a square within the slider created by Swiper, InteractJS should be notified that it can manipulate the square. At the same time Swiper must also be notified that the square cannot be manipulate until the square has been put back into the slider. If this is not done, every square in the artwork frame will be moved whenever the slider is activated. Due to time constraints this has not been investigated further.

As mentioned before the look and feel of the website could be improved by removing Bootstrap and instead put some time into creating custom styling for the website. Furthermore, due to time constraints no animations or transitions has been implemented on the site. It would make sense to add a few small unobtrusive animations (for instance using the ngAnimate module) to improve the look and feel of the site and make the experience more fun and delightful.