

Multimedia & HCI

ASSESSMENT

LEE GLEN - 2617995

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Concept of the Application

Brief

The general concept of this application is a website dedicated to introducing programming from the very steppingstones for example “Hello World” to advanced object-orientated programming but the catch is it can be seen through different languages like for example seeing how classes are made through Java but also through C++ as they create classes in a very different way and also it goes through a step-by-step process so for example explaining what a class is it would show a class diagram then show pseudocode of how to create a class and then the actual code all with a little paragraph explaining.

The target users that I’d think would use this websites would be either beginners to programming who’ve never programmed in their life who would like to start at the beginning and work their way down, people who are intermediate who knows the basics who want to go into further than the basics and finally people who know one specific programming language but who would like to learn a completely different language.

How I’m going to deliver this is through an interactive website using of course HTML, CSS and JavaScript which will create the design and interactivity of the website. What I’ll be doing is:

- Creating wireframes using guidelines to show what the initial layout of the website will be and further adding onto it.
- Creating a navigation map to show the navigation between webpages of the website.
- Research into different colours and fonts for people of disability so more people can properly use the website and understand the content of the website.
- Using what I’ve created previously develop the initial prototype using the wireframes, navigation map etc.

Personas

Here I’ve created two distinct personas that may use this website.

Barry Aguilar

Barry is a dyslexic high school student who taken advanced higher computing and is currently learning about Object-orientated programming in but he is having trouble understanding the concepts as what language he is using doesn’t do Object-orientated programming so for example he doesn’t understand how classes are made or what is

instantiation is as he doesn't have an example to see through code so relating to this website I'm making he can see with step-by-step process a class diagram with attributes and operators to actual code and then will get to run the code so that he gets a better understanding of what those concepts are.

Kristina Shelton

Kristina is currently a Software engineer who's main language they know is Java but recently a project has come up in which it needs to be done in C++ and she is assigned to do so even though her knowledge is Java so a head of time she has on her own is teaching herself how to program in C++ and in regards to this website I'm building because she's more or less knows all the knowledge on this website she could just switch tabs from Java to C++ to see the differences between the languages for example how in Java you would just declare the class in one .java file but in C++ the declarations of functions and variables are in a separate .h file and then the implementation of the functions of the .h file would be in a .cpp file.

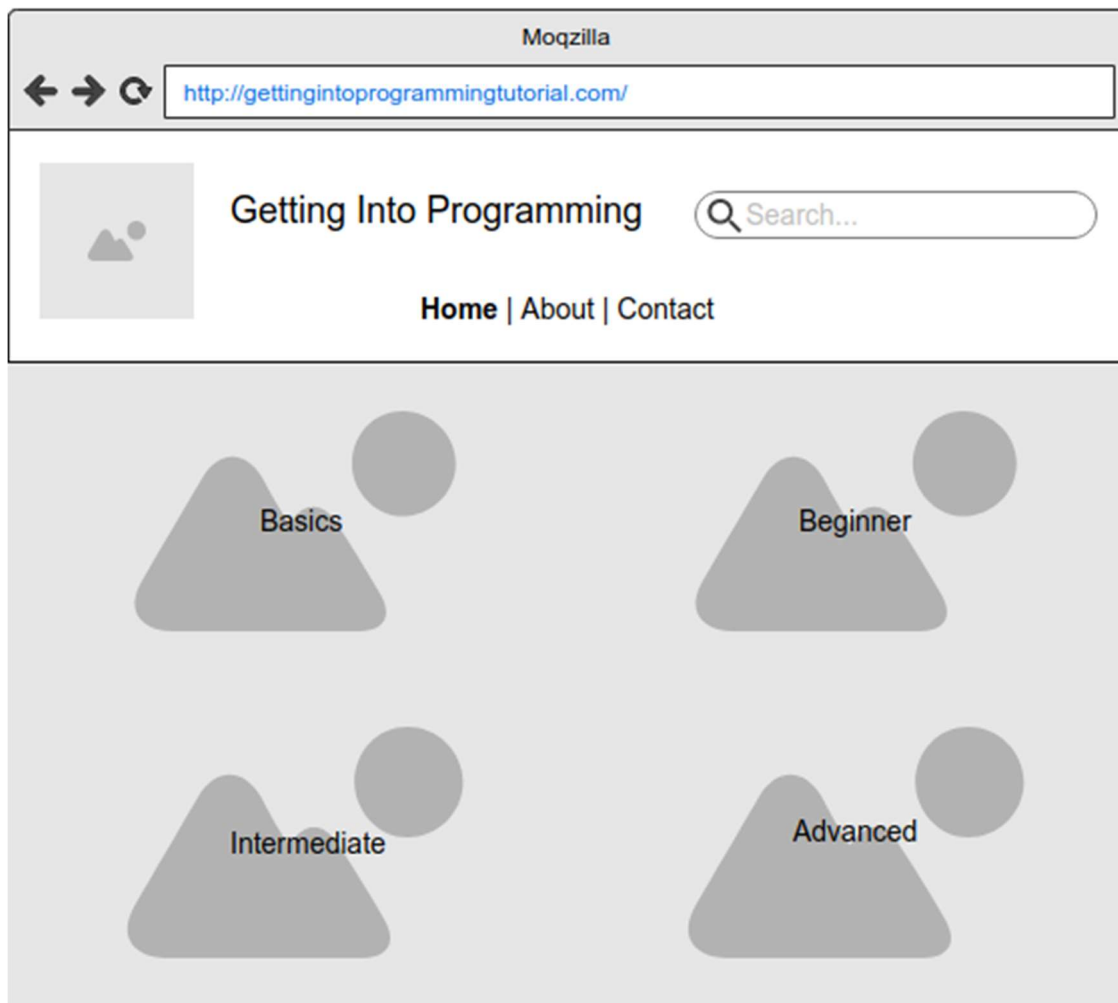
Design of the Website

The outline on what I'll be designing for this website is:

- Wireframes – To get an mockup of the layout of the website and get a rough look of what the web pages would look like following different design principles like Fitts' Law, Hick's law etc.
- Navigation Map – To understand how the website will be navigated and which webpages will link to each other.
- Research: Colour Scheme & Fonts – To understand what colours and fonts is best for most users to look at so that the website isn't a visual mess.

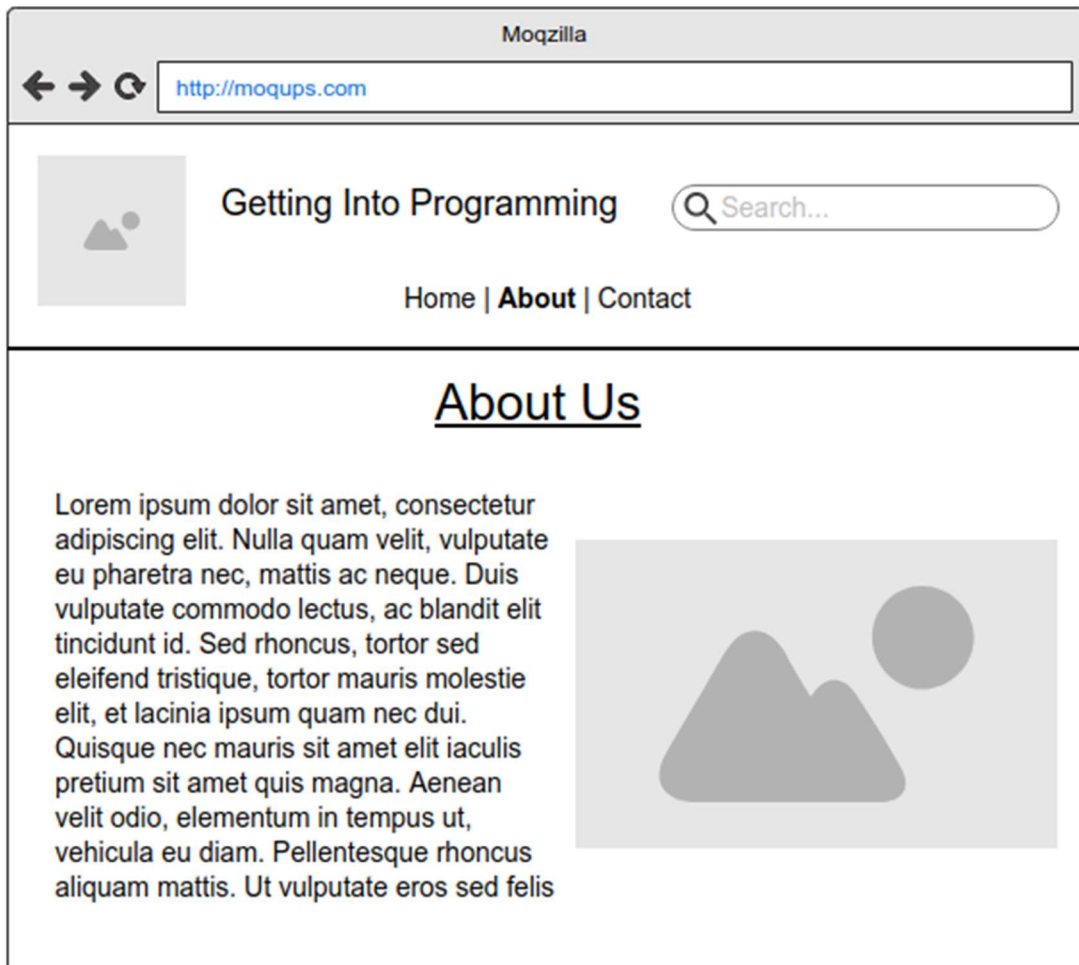
Wireframes

Here are some wireframes that is for the website:

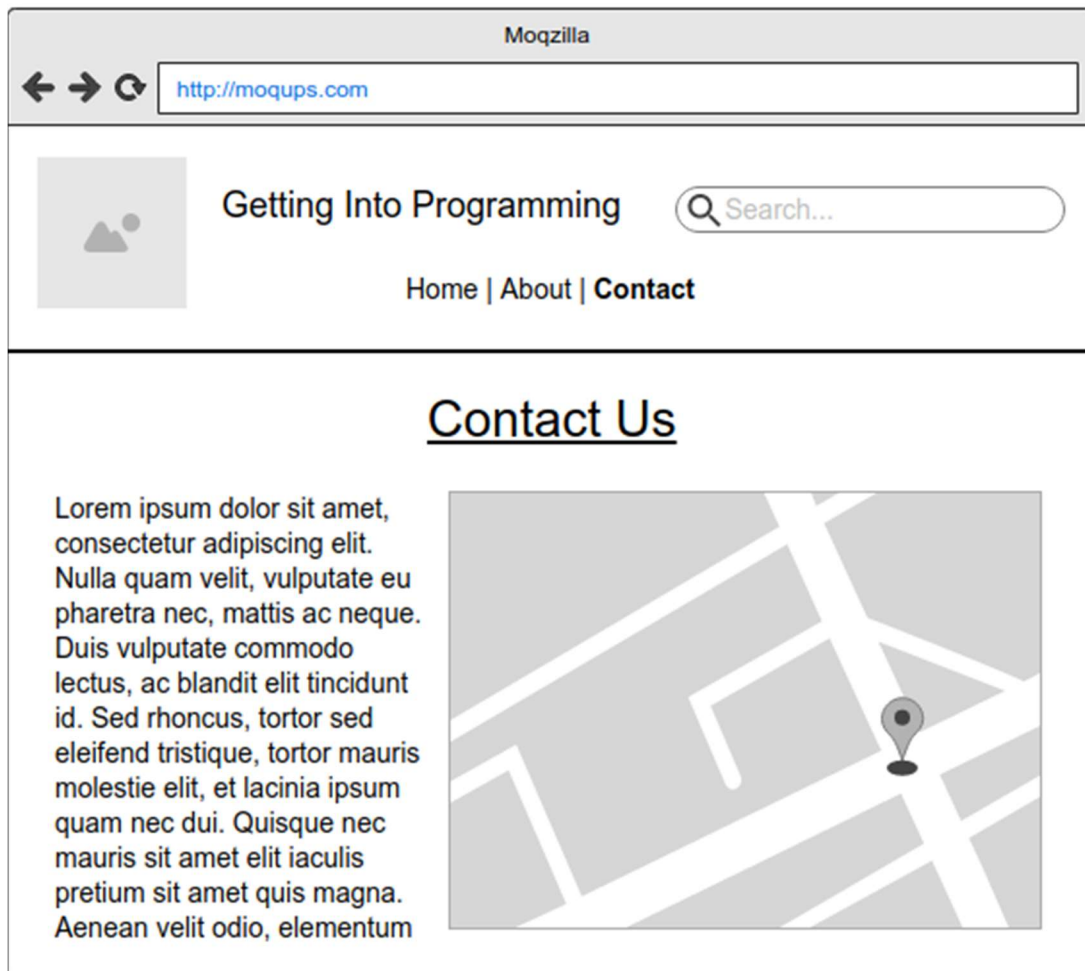


This is the home page of the website and the first page the user will see. The four images in the body of the website are links to other webpages inside the website. In the header there is a menu linking to three webpages that will be on every webpage and a search bar that will site search querying whatever the user has entered.

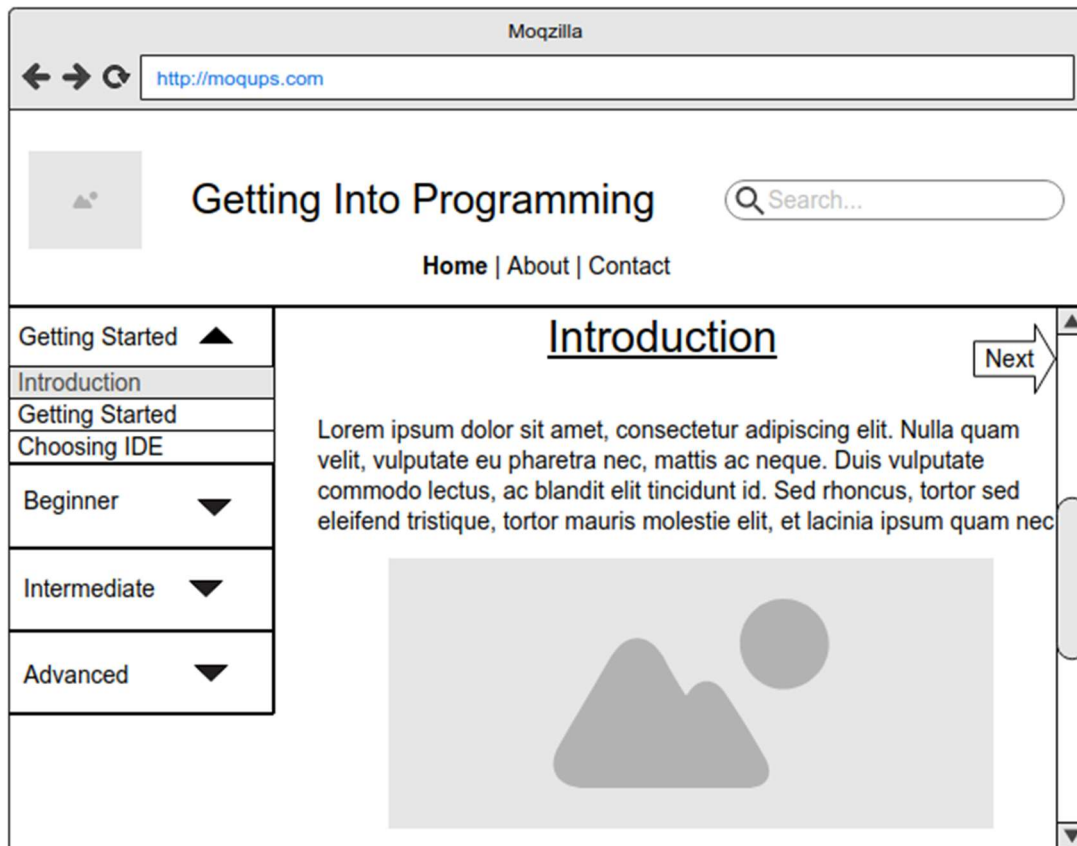
For the images I followed one of Gestalt laws which was the law of proximity - (User Testing, n.d.), (Thompson, 2017) - as all four of these images are related to the tutorial so it's best to group them together.



This is the about page where the user will be able to see the companies background on who they are. As I said for the index page it has the same menu and has the search bar. In the body the text will be on the left while it's likely that an image of the company or the team will be on the right-hand side.



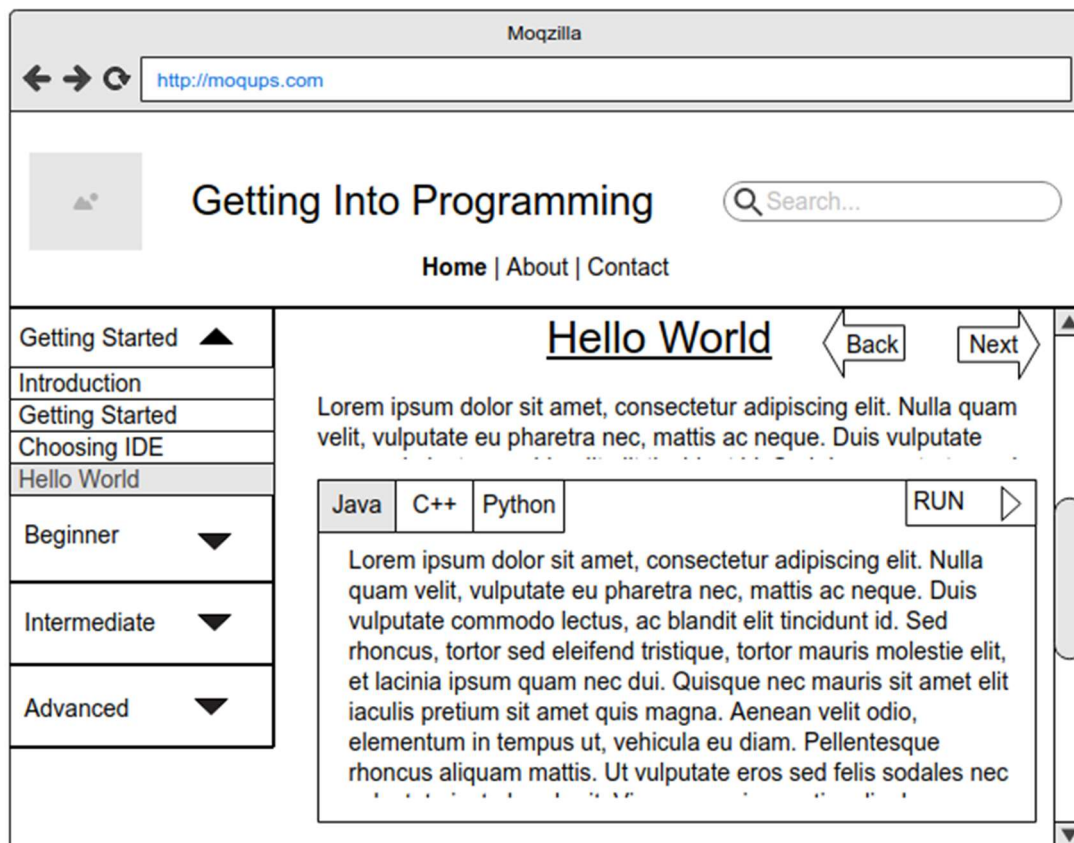
This is the contact page which will have a google map with the location specified by the company (in this case the Cottrell building at the University of Stirling) and next to it will be the contact details of the company. Same as before the header with the menu and the search bar will appear on this page.



This is one of the tutorial pages. This will consist of a vertical side menu that will link to each tutorial page and is set into four different categories relating to the difficulty of the subject and when you hover over the buttons for example there will be feedback that the specific button will light up as it will change colour to indicate that it is clickable.

The rest of the body will consist of the information of the specific subject so in this wireframe it is the introduction to the tutorial with it mainly consisting of text and images or further down the line tabs.

The top right of the body will have a forward and backward button and used the metaphor of right and left being forward and backward which commonly seen in browsers which this website is going to be on so there will be familiarity to the page but also there is text indicating that it will be going to the next part of the tutorial.

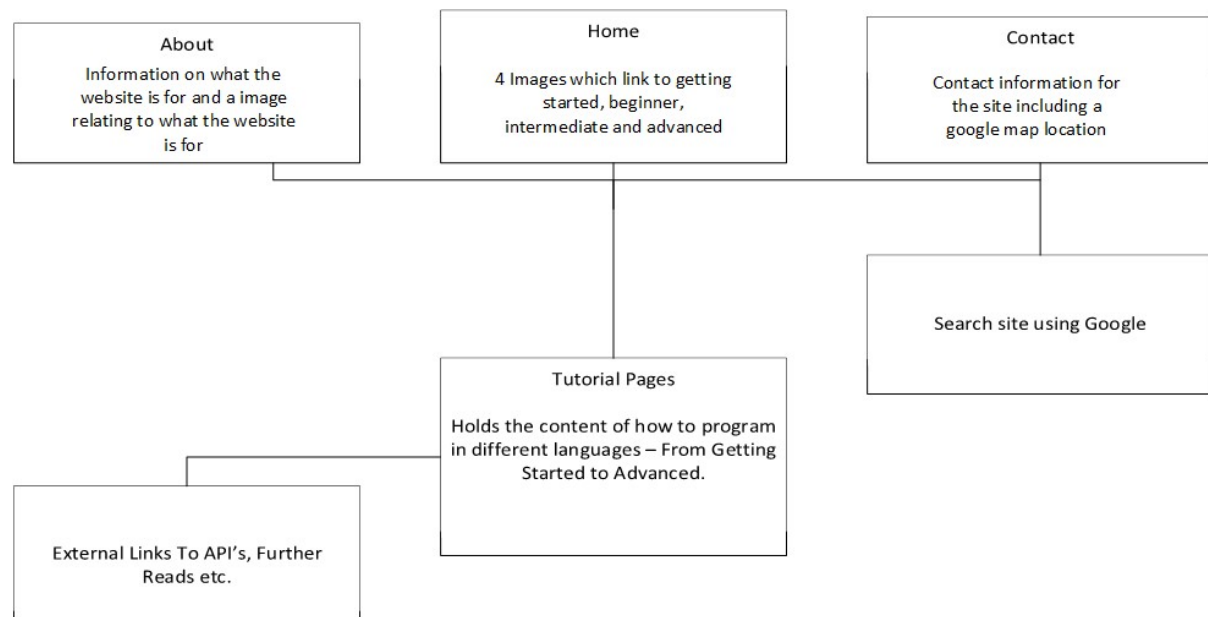


What this wireframe is showing is the box that will contain all of the code for the three programming languages by using tabs to navigate to the code for the three programming languages and similarly to the side menu when hovering over a tab it will change colour to indicate that it is clickable.

The run button in the code area will be clickable to run the code in the code area. The triangle is supposed to be related to how in IDE's like IntelliJ and Visual Studio will have a run button with a green triangle giving the user familiarity to what the button does.

Information Map

Here is the navigation map for the website showing what pages you can navigate to:



As you can see the about, home, contact and the site search can all be accessed and navigated to but only home can access the tutorial pages. The tutorial pages may have external links to other websites like downloads for IDE's or for example the Java API or the JDK etc.

Colour Scheme

The reason I am mentioning a colour scheme is that according to Colour-Blind Awareness – “Colour (color) blindness (colour vision deficiency, or CVD) affects approximately 1 in 12 men (8%) and 1 in 200 women in the world.” (Colour Blind Awareness, n.d.) – so that there is potential that quite a medium sized portion of people can't understand or read the website if I don't pick colours that coincides with their colour blindness.

In this web article written by Connor Turnbull one of the ways to deal with colour blindness is to design with only one colour and using the various shades of that colour - (Turnbull, 2011) - and using a website called paletton.com it allows me to pick colours with shaders relating to those colours and then being able to see an example website with those colours. The colour I am going to be using is variations of blue and the hex code for this colour is 1D5882 and for the text I'm going to use white as everyone can see white or at least a variation of white. Here is an example website from paletton with these colours:



Source: <http://paletton.com/#uid=13w0u0kqwprcm2Vk7flvQFECB+N> and click examples...

Fonts

According to Luz Rello & Ricardo Baeza-Yates study on good fonts for dyslexia study – “Good fonts for people with dyslexia are Helvetica, Courier, Arial, Verdana and CMU, taking into consideration both, reading performance and subjective preferences.” (Rello & Baeza-Yates, 2013) – From this I will be using both Helvetica and Courier as my fonts, Helvetica for my headers and Courier for my body.

Scenario – Barry Aguilar

As Barry wants to begin learning how to program in object-orientated programming, he'll need to go to the advanced part of the tutorial and will most likely be using this website on a desktop as he'll be viewing this on his school computer and depending on the monitors resolution it may move the content of the website.

From the home page he'll look at the four images that have text on them and he will click on the first image and will be brought to the introduction tutorial page and then look at the side menu and click on the categories until he finds that the advanced category has OOP and then click on the introduction OOP tutorial page.

From here he will then read the text that is inside the tutorial page and then click on the forward button to go to the next tutorial page. From here on he will be reading the

information in the tutorial pages, looking at the class diagram and then click on the tabs for the code so that he can understand how classes are made or what is instantiation look like in a programming language and being able to run the code .

Scenario – Kristina Shelton

Kristina will already know the knowledge that is already on the website and she's mainly wanting to see the differences between the languages and primarily she'll be using a laptop to view this website so it'll be a smaller size for the resolution meaning that the content will move due to the size of her screen. Once she's on the home page she'll most likely click on the Advanced image as she expects to see Object-oriented programming to be in the Advanced section of the tutorial.

Once she is on the introduction page for OOP she'll click on the forward button as she is not interested in the intro. Once she is on the classes page she'll go to the tabs and click on either C++ or python to see how to create a class in either C++ or python and will follow how to.

She'll most likely not click on the run button as she'll already expect the outcome but might do so if she's something new and doesn't understand what it means so for example in C++ there is a thing called de-constructors that Java has but does so automatically but in C++ you'll need make it yourself so she may run the code to see what it would do.

The Prototype

My prototype currently got all the pages I wanted and almost of the pages have the content as in for example how to make an array etc. The content that isn't in some of the pages are from the Advanced category besides the OOP – Introduction and Classes page which would be further added to in the next iterations of the prototype.

I also noticed while going through the website that when I was creating some of the pages and got to develop the content of those pages I keep realising that some of the content that I'm including could just be its own page and the reason I didn't create those pages was due to time as making the page, creating the code of the content, thinking on how to describe the subject took a lot of time so for the next iterations of this website quite a few more pages would be added with more content.

I got the vertical side menu which goes to each tutorial page and the pages are separated by categories. I've also got the menu in the header going to the home, about and contact pages. I didn't however get the search bar to work as I needed to pay google money to site search plus the fact that google site search is now discontinued however this could change during further iterations as I could find a replacement and implement it but for now it displays a message saying what it would've done.

I did get the tabs for the code sections of the tutorial pages in there but I couldn't get runnable code in there however to counteract this I made videos of running code in the IDE's that I specified in the Choosing An IDE page in the Getting Started category for each language and then further down the line I could figure out how to get the code to run on the site in another iteration.

I also got the google map to appear in the contacts page however because I need to pay to have the google map to not be in development mode so it'll say on the google map that it is for development purposes only which in reality it is currently.

All the styling is there with the colours I've specified in my colour scheme and the fonts as well and that the content of the pages will change depending on the resolution size of the browser so that it can be viewed on relative sized screens like a desktop or a laptop but I don't have a layout for tablet which there is a high-likely chance that someone may use their tablet to view the website and program on the desktop kind of like having to monitors so that would need to be further developed in further iterations of the prototype.

Media/Web/Image Sources

For Images I used:

- <https://www.pexels.com/photo/close-up-photography-of-program-codes-1089440/>
- <https://www.pexels.com/photo/photo-of-green-data-matrix-1089438/>
- <https://www.pexels.com/photo/codes-coding-computer-programming-270488/>
- <https://www.pexels.com/photo/lines-of-code-2653362/>
- <https://www.pexels.com/photo/html-codes-2061168/>

These five images are all free to use and I used them for the four-image menu and the logo for the site. However, the image for the class diagram is mine.

For the videos there all mine and where recorded on my laptop.

For the side navigation bar, I used w3schools tutorial and made the side navigation bar with quite a few tweaks to it. –

https://www.w3schools.com/howto/howto_js_dropdown_sidenav.asp

For the tabs I also used W3Schools tutorial on them and made the tabs with changes to it to fit the website. –

https://www.w3schools.com/howto/howto_js_tabs.asp

For the google map I followed googles tutorial on how to create a google map for my website and how to specify the location and the marker etc. –

<https://developers.google.com/maps/documentation/javascript/adding-a-google-map>

Usability Testing

For the usability testing I went to the lab on Thursday, 7th of November but previously I tested the website beforehand but in the lab, I got people to test my website and I got feedback from them.

References

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<https://webdesign.tutsplus.com/articles/designing-for-and-as-a-color-blind-person--webdesign-3408>
- User Testing. (n.d.). *Gestalt Principles*. Retrieved from User Testing:
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