Teaching Aid Application for Students with Disabilities

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Gregynog Presentation

The Motivation behind this project:

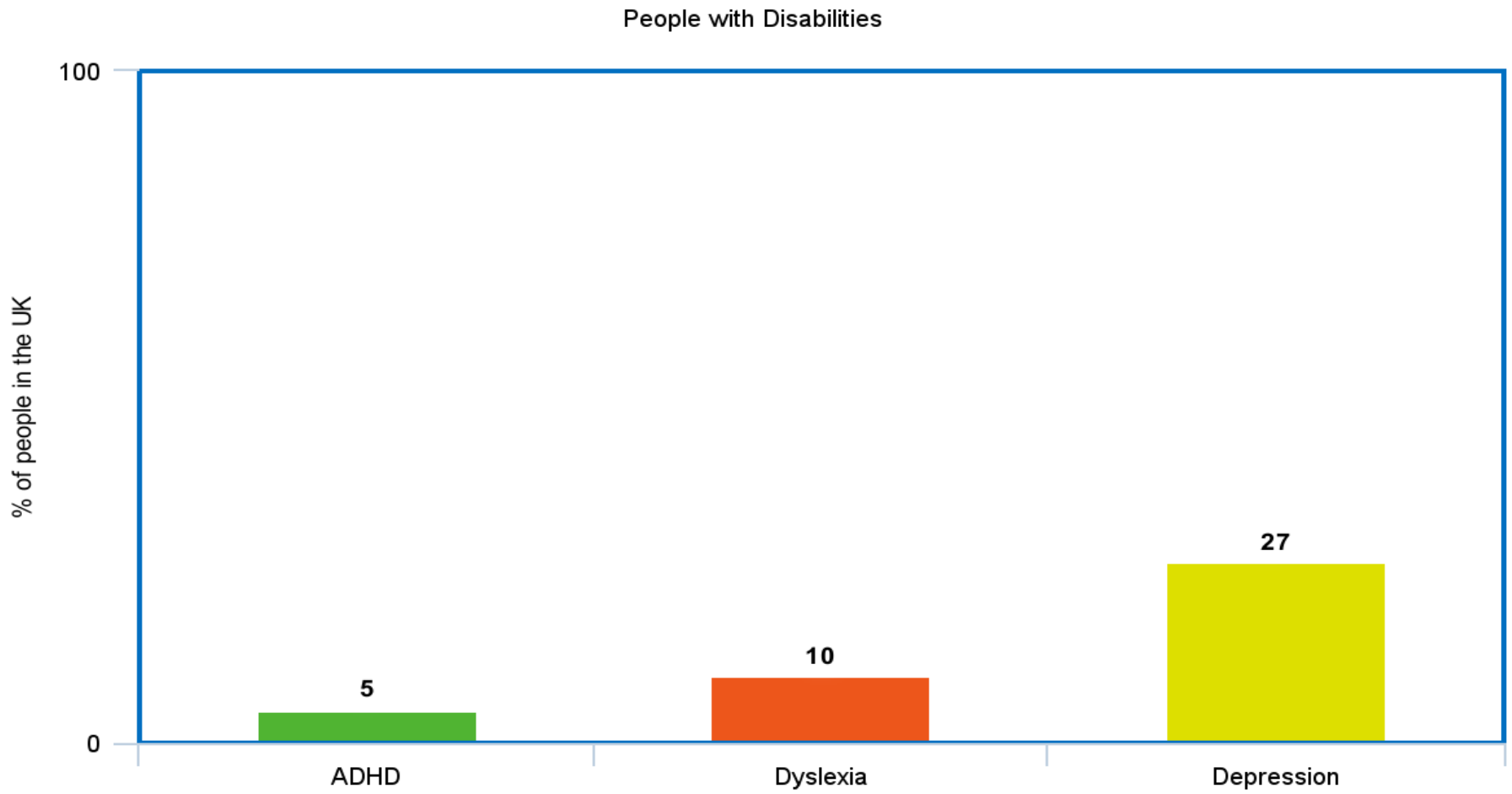

Figure 1:
Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social Psychiatry and Psychiatric Epidemiology*, *43*(8), 667–672. https://doi.org/10.1007/s00127-008-0345-x

British Dyslexia Association. (2016). About the British Dyslexia Association | British Dyslexia Association. Retrieved from http://www.bdadyslexia.org.uk/about/20-Nov-2016

What is ADHD? | AADD-UK. (n.d.). Retrieved from https://aadduk.org/symptoms-diagnosis-treatment/20-Nov-2016

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Pedagogical needs of the students

Pedagogical is a term used to define the way the content is delivered to the student. This is an extremely important aspect in this project . The issue in the project is to try and digitize the approaches, for the students, into the application and try to humanize this approach for them.

Figure 1: Coloured Overlay Assessment and Meares-Irlen Syndrome. (n.d.). Retrieved from http://www.optometrists.co.uk/examinations/Coloured_Overlay_Assessment_and_Meares-Irlen_Syndrome/

Aims of the project

```
.marigns{
    margin-right:2cm;
    margin-left:2cm;
    background-color: rgb(154,160,168);
}


.main_section{
    background-color: rgb(190, 255, 199);
}
```

Figure 1: Integration of a CSS colour pallet for Colour Blindness

There are two main aims that I
am trying to achieve. These are:

1. Ensure successful integration of needed pedagogical approaches.
2. Ensure content deliverable is to a decent standard.

These aims can be measured by
getting a set of students to use the
application at the end of each development phase.

Why it's a Web App

The reasons that the application has been settled on after considering other options, such as a Java Applet, Mobile App, is that the tools available to a Web App is far greater and allows for a more powerful application to try and achieve the aims set.

```
19
20          <div class = "collapse navbar-collapse" id="bs-example-navbar-collapse-1">
21              <ul class = "nav navbar-nav">
22                  <li class = "active"><a href = "#">Home<span class="sr-only">(current)</span></a></li>
23                  <li><a href = "#">Overview</a></li>
24                  <li class = "dropdown">
25                      <a href = "#" class="dropdown-toggle" data-toggle="dropdown" role="button" aria-haspopup="true" aria-expanded="false"> Basic Topics <span class="caret"></span></a>
26                      <ul class = "dropdown-menu">
27                          <li><a href = "#"> Section 1 Data Fundemental: What are they</a></li>
28                          <li><a href = "#"> Section 1.1 Data Fundemental: Variables and Naming Conventions</a></li>
29                          <li><a href = "#"> Section 1.2 Data Fundemental: Arthemtic Operators</a></li>
30                          <li><a href = "#"> Section 1.3 Data Fundemental: Input/Output (I/O) </a></li>
31                          <li role = "separator" class = "divider"></li>
32                          <li><a href = "#"> Section 2: Conditions</a></li>
33                          <li><a href = "#"> Section 2.1: If statement/Nested Statements </a></li>
34                          <li><a href = "#"> Section 2.2: If else </a></li>
35                          <li><a href = "#"> Section 2.3: Boolean Operators + &amp;&amp; and || </a></li>
36                          <li role = "separator" class = "divider"></li>
37                          <li><a href = "#"> Section 3: Loops </a></li>
38                          <li><a href = "#"> Section 3.1: While Loop and Do-While Loop </a></li>
39                          <li><a href = "#"> Section 3.2: For Loop and Advanced For Loop</a></li>
40                          <li><a href = "#"> Section 3.3: When to use what kind of loop</a></li>
41                      </ul>
42                  </li>
```

Figure 1: HTML Code for the main page

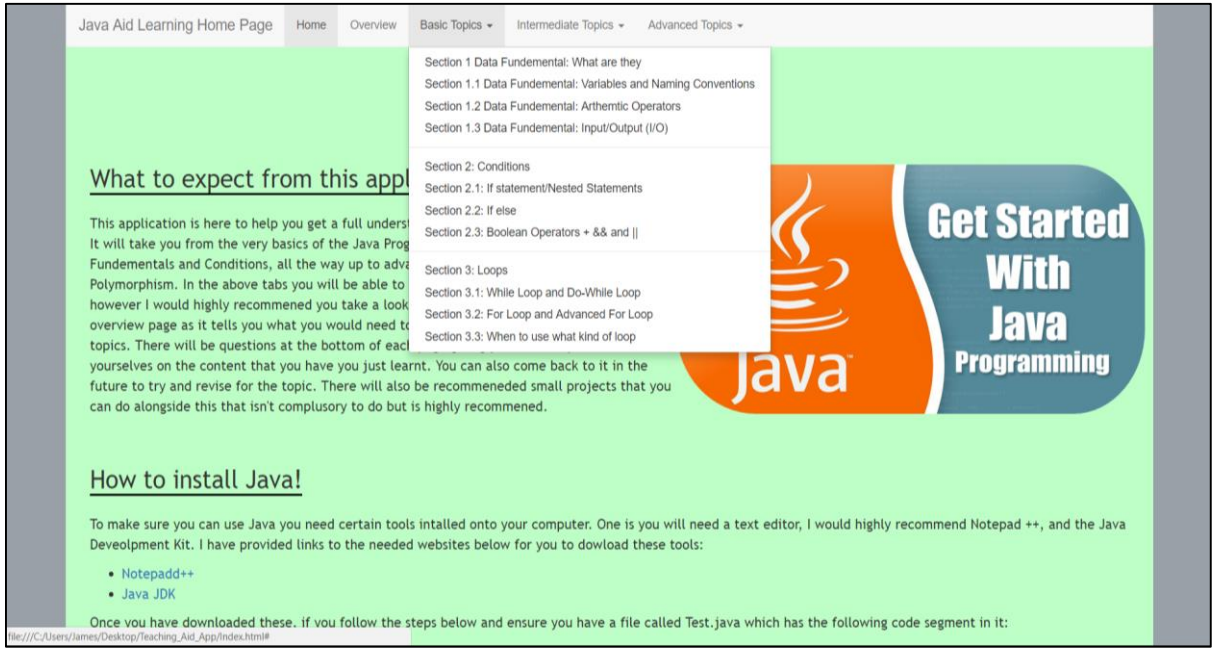

Figure 2: Compiled and Running view for the main page

D3 Tree for Students with Asperger’s

```
];

var width = 780;
var height = 780;

var i = 0;

var tree = d3.layout.tree()
    .size([height, width]);

var diagonal = d3.svg.diagonal();


//Creating a canvas and appending a group element to place the tree
var svg = d3.select("body").append("svg")
    .attr("width", width)
    .attr("height", height)
  .append("g")
    .attr("transform", "translate(" + 0 + "," + 40 + ")");

root = treeData[0];

update(root);

function update(source) {

  // Compute the new tree layout.
  var nodes = tree.nodes(root).reverse(),
      links = tree.links(nodes);

  nodes.forEach(function(d) { d.y = d.depth * 100; });

  // Declare the nodes…
  var node = svg.selectAll("g.node")
      .data(nodes, function(d) { return d.id || (d.id = ++i); });

  // Enter the nodes.
  var nodeEnter = node.enter().append("g")
      .attr("class", "node")
      .attr("transform", function(d) {
          return "translate(" + d.x + "," + d.y + ")"; });

  nodeEnter.append("circle")
      .attr("r", 10);

  nodeEnter.append("text")
      .attr("y", function(d) { return d.children || d._children ? -18 : 18; })
      .attr("dy", ".35em")
      .attr("text-anchor", "middle")
      .text(function(d) { return d.name; })
      .style("fill-opacity", 1);

  // Declare the links…
  var link = svg.selectAll("path.link")
      .data(links, function(d) { return d.target.id; });

  // Enter the links.
  link.enter().insert("path", "g")
      .attr("class", "link")
      .attr("d", diagonal);

}
```

Figure 1: Code snippet for the Treelayout from D3

In this example I am using the D3 treelayout to construct a knowledge model that maps a pathway through the content of the first years programming module. This benefits students that suffers with Asperger's as they thrive in situations where there is a clear structure and wont result in them panicking.

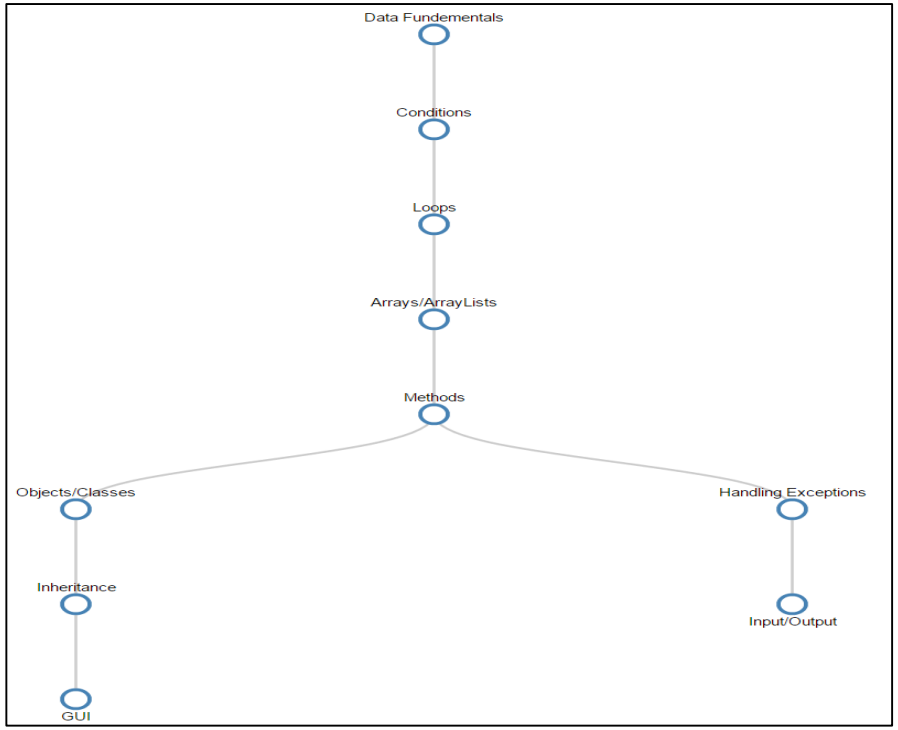

Figure 2: Output for the Treelayout from D3

Summary

Almost there!
The main aspects that I've discussed today are:

1. Pedagogical aspects in planning the design for the application.
2. The end deliverable content that will be on the application.
3. Tools that support it's development as a Web App.
4. An example on the implementation for Asperger's.

Future Work

Main aspects to be done:

1. Continue research into pedagogical approaches focusing on Dyslexia and Anxiety
2. Improve the existing D3 Tree to allow an interactive nature.
3. Add jQuery integration to allow dynamic behaviour.
4. Implement the questions onto the app that have been designed.