**Reflective report on prototype student dashboard**

**Layout of the final website**

The completed website meets all of the expectations mentioned in the pitch. Each sub page has a navigation bar and each element in the menu bar leads to one of the 5 pages of the website. 4 of them are divided by the data displayed – Attendance, Exams, Coursework or Group data and there is also home button which displays icons and allows navigating to said pages via large icons which could be useful for devices with smaller screens. Attendance sub page displays a list of months of the year as a second navigation bar, each month leads to appropriate section in the page on click. Each section (month data) consists of a responsive stacked graph which displays information about the users attendance by module (missed and attended lectures) and also a doughnut chart which shows total attended and missed lectures on hover. Exams sub page also has second navigation bar, but instead of months there’s module names of student’s course. Navigation bar behaves in the same way as Attendance page. Information about each module is displayed in sections: exam mark, class it represents (1st, upper second, lower second, third or failed) and also time taken to complete the exam. The information is also visualised with doughnut charts which allows the user a quick look at how he or she is doing on the course and separate modules. Coursework sub page has same navigation as Exams sub page. When clicking on a course name user is taken to the section of the page where all of the courseworks of a module is displayed and each coursework has two values of information about them: Mark received and class it represents both represented by text and doughnut charts. Group Data sub page also has the same navigation bar as in Exams sub page. Each section displays module name, total attendance of the course, exam average mark and average mark for all the courseworks. This is also visualised by doughnut charts since there is no need for more complex ones.

**Technical features of the website**

Since bootstrap was used for the website it scales well with smaller screen. Elements resize automatically and on small screens the grid collapses and is displayed one cell per row which makes the elements larger and easier to read. Also the navigation bar collapses to hamburger menu, this makes the second navigation bars disappear, however this seems to be common practice in website development – cutting down some of the functionality on mobile devices by not changing the layout of the website and still providing tools to navigate the website. Chart.js library was used to visualise data mostly due to its simplicity and because it met my expectations, also it has automatic animations and a feature which displays data when user hovers the mouse over an element of a graph. Extensive documentation also was a factor why I decided to use Chart.js. JavaScript for generating a doughnut chart also included a feature where the colour of a doughnut changes depending on the ratio between given value and given maximum value – as the ratio increases RGB value for green increases and value for red decreases, this allows the user to quickly spot his successes and failures highlighting points to improve upon.

**The process of development**

Since this website was the first I have ever done it was quite a struggle. At first my idea was to use data generated with excel tools, exporting it to space separated values text file and then using JavaScript to display appropriate charts. After generating the data of 200 students with attendance record for each day of each month I have noticed that due to security reasons JavaScript does not allow direct reading of files stored locally on the computer if user does not specify the file, so I tried to use Java to generate JavaScript file from .txt file, which adds all the data to single JavaScript object. Even though I was successful this did not seem like a good practice, so in the end I have decided discard all the work I have done and hardcode the data I needed to html and CSS without doing much data processing since after reading the specification for the website again I have noticed that is only a prototype. After the layout of the website was planned, I have started learning bootstrap, which was not difficult since it had extensive documentation and many examples (I used w3schools bootstrap tutorial). After the layout was complete, by looking at the documentation for Chart.js and examples provided in their website I have adapted the code to create a basic class for the doughnut chart, then stacked chart and created one more file that tweaks the doughnut chart to scale appropriately or display data on hover. Finally I have used JavaScript to generate HTML and JavaScript elements in Attendance page and finished up by searching the internet for free icons for the homepage.

**What could have been done differently**

Reflecting on the work I have done there were definitely flaws in the approach I have chosen and also there are things to improve upon when it comes to website design itself. First of all I should have planned my time better and instead of wasting time generating data and doing things that are not important, I should have searched for pre-existing methods to process the data and I should have found out that JavaScript is not designed to read data from local machine and maybe instead used the time to consider loading data dynamically with SQL as an alternative to hardcoding static data. One more thing that I could have considered doing was looking at more examples of dashboards to learn what are the common styles and navigation used in them and maybe displaying everything on a single page using JavaScript and jQuery and some library to load the panels and reposition them dynamically depending on the button clicked. This would look better however it might be more difficult to make such website scale well with mobile devices.

**Project outcomes**

During the time I have spent on the assignment I have picked up several skills. Firstly, I have learned that when it comes to website development, planning is a crucial part before actually starting to code the website and that planning saves time in the long run. Using bootstrap was great experience for me because I learned about new concepts such as grid systems, learned the importance of writing code that scales well with different devices. Chart.js library also taught me different ways of importing and using libraries (since this was the first time I have used external library for web development), also I have remembered how to use CSS which I have learned in classes to reposition elements when needed.