Milestone 2

Project goal

The goal of our project is to create a visualization of student's grades and skills based on their transcript. We divided our goals into 2 parts: core and advanced. Core visualizations are essential for our project and form a Minimal Viable Product while advanced are the way to make it richer and more powerful.

Core visualizations

1. *Grades:* All classes completed by a student are visualized in a form of radial histograms where petals represent classes. The overall chart is a progressbar – it will be closed when the program's required number of credits is obtained. The plot has the following properties:
    a. Core circle has a GPA and number of completed credits.
    b. Petal width represents the number of credits for a class
    c. Petal height represents the obtained grade out of 6
    d. Petal color represents the type of the class (Core (in green), Optional (in blue), Project (in red) etc.)
2. *Program's requirements:* A set of progress bars and checkboxes representing the status of the student's program requirements (e.g. how many core credits are already completed out of 120, is mandatory internship completed etc.)
3. *Skills:* We count the number of credits that student completed out of every study program at EPFL (Data Science, Computer Science etc). and then take top-n (e.g. top-7) programs and visualize it in a form of radar plot. This plot should represent how proficient a student is in different areas.

Grades and *Program's requirements* visualizations are on one screen, *Skills* visualization is on another, and there are buttons to switch between them.

Advanced visualizations

1. *Interactive petals:* Make all petals clickable. When you click on the petal, the whole grade plot moves to the right, all petals rotate to make the chosen petal the most left horizontal, and the frame with the course info appears on the left side.
2. *Class info:* When you click on a petal as described in the previous point, some info about classes appears. What are we going to visualize:
    a. Professor names, description, prerequisites, section names - all of this are parsed from the EPFL website.
    b. Different visualizations of grades of other students for this course: histogram of their grades and plot of average grade over the years. We will generate and use fake data for it for now due to privacy reasons.
3. *Create a suggestion system for future courses:* Add a button that will suggest which courses to take based on the program requirements. Such courses will be added to the main radial plot as semi-transparent petals.
4. *Two skills sets:* Add additional plot of different color on the *Skills* visualization that counts only core credits.
5. *Make skills set interactive:* Make the points in the radar plot clickable and show courses that contributed to this skill on click.
6. *Make course info interactive:* Make the professor names on the course info clickable and show all classes of this professor on click.

Used tools and lectures

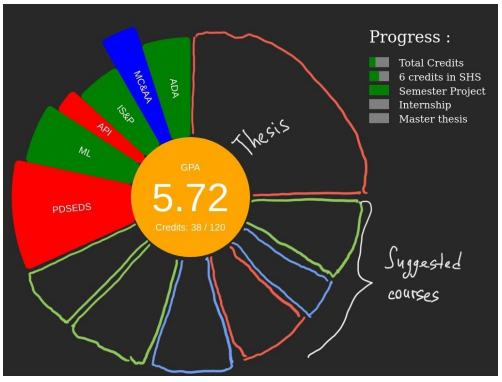
We will need the following tools and lectures in our visualizations:

1. HTML as a mark-up language (Lecture 1)
2. Javascript as a main programming language (Lectures 2 and 3)
3. D3.js for all visualizations as a core part. (Lecture about D3)
4. Proper event handling to make plots interactive (see points 1, 4, and 5 from Advanced visualization description) (Lecture about more interactive D3)
5. We also are going to use React to manage different components in our visualization
6. We also need to make the plot beautiful and easy to understand. Lectures about perception colors, designing viz and do-and-don't in viz will help us with that.
7. Lecture about visualizing of tabular data will help us to derive a visualization for class info (point 2 from Advanced visualizations)

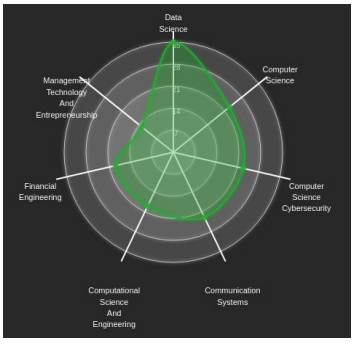
Our website

We have a deployed version of our visualization with the following URL: https://studyassistant.netlify.app/. For now our website works only in Chrome (sorry for the inconvenience). The following visualizations are already implemented: all core visualizations and points 1, 2 from advanced visualizations (it is ugly now, we will work on it ;)). Since almost all necessary parts are already on site, we provide screenshots (with sketch upon it) of our website instead of sketches. If you want so see exactly sketches, you can take a look on our Milestone 1. Additional visualizations are mainly focused on additional interactivity, that's why it's impossible to represent them in a form of sketch. Drawed petals on grades histogram represent suggested courses.

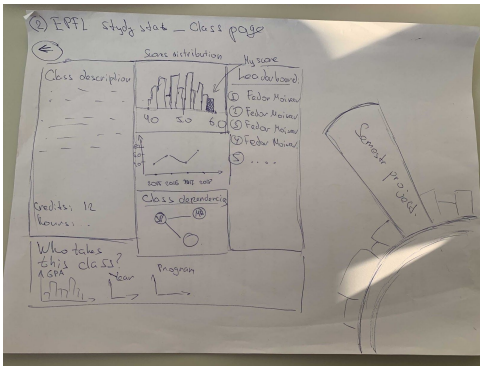
Grades histogram



Skills plot



Course info



Guide for using our website

1. On the first page you will see the window where you can drag and drop your transcript and the button "Use Mock transcript". It is also important to note that now the transcript parsing code was tested only on our team members' and their fiends' transcripts. You may try it on any other, but there is no guarantee that it will work correctly. To see all the charts in a way it was intended you may use the "Use Mock transcript" button.
2. After uploading the transcript the screen with grades visualization in a form of radial plot will appear. Different properties of petals and core are described in point 1 of Core visualizations. Program requirements are also visualized (for now it is hardcoded) (point 2 of Core visualizations) on this screen.
3. You can click on the petal to see the class info.
4. You can click on the "Show skills" button to show skills visualization (point 3 of Core visualizations). Skills are computed for each transcript based on the actual EPFL programs. You can also click on the "Show credits" button to move back to the grades visualization.