Frontend Optimization

**DEADLINE:** 20/06/2022

## FOLDER STRUCTURE

|  |  |
| --- | --- |
| FL19\_HW5/ \*  ├─ task  ├─ homework/ \*  ├─ styles/ \*  ├─ bootstrap.min.css \*  ├─ font-awesome.min.css \*  ├─ critical-styles.css \*  ├─ styles.min.css \*  ├─ styles.css \*  ├─ img/ \*  ├─ fonts/ \*  ├─ js/ \*  ├─ jquery.js \*  ├─ bootstrap.min.js \*  ├─ jquery.parallax.js \*  ├─ smoothscroll.js \*  ├─ lazyload.min.js \*  ├─ custom.js \*  ├─ index.html \* | \*  - required |

## TASK

Make front-end optimization for FL19 page including:

* Add “Critical CSS” to provide quick first meaningful paint:
  + Copy styles from “critical-styles.css”
  + Paste them in <head> as inline styles using tag <style>
* Minify and Concatenate CSS in one file (Use online tool [Shrinker](http://www.shrinker.ch/)).
* Implement asynchronous load of CSS and JS:
  + For JS use ‘defer’ or ‘async’ attributes for ‘script’ tag
  + For CSS use “media” and “onload” attributes.
* Create smaller version of all images for mobile devices. Use ‘srcset’ attribute to show proper image depending on screen size.
* Deliver scaled image sizes for desktop and mobile devices
* Implement lazy load of images using “lazyload” plugin ([lazyload.js](https://github.com/verlok/lazyload))

**Setup:**

- Install Node.js and NPM (skip this step if already installed)  
- Install local web server running `npm install -g http-server` (use `sudo` in case of permission errors)

- Open project folder in terminal/command line and run `http-server` command

- You can find your server running on ‘http://127.0.0.1:8080’

- All CSS and JS libraries can be found already downloaded and ready to use in project folders

- Use ‘Network’ tab in browser Developer Tools to check performance improvements. Try it in Incognito mode as well.

- **Mandatory**: ‘Disable cache’ flag should be checked in ‘Network’ tab to prevent assets from caching

**RESTRICTIONS**

* Vendor libraries source files shouldn't be touched at all
* No need to use any of build systems (grunt, gulp, webpack)
* Adding **task/** folder is forbidden. Do not push it to repository. (Only **homework/** folder should be pushed)

## BEFORE SUBMIT

* Code should be clean, readable, and tested
* Check ‘Network’ tab to be sure that all performance improvements work properly
* Using Chrome, open ‘Lighthouse’ tab in Developer tools menu. Run ‘Generate report’. Score should be not less than **70**. Use settings:
  + Device – Desktop
  + Categories – Performance
* Make sure your GitLab folder structure meets folder structure from this document (without **task** folder)
* Fix all issues which was found by w3org Markup Validation Service (<https://validator.w3.org/>)

## SUBMIT

* The **FL19\_HW5** folder without **task** folder should be uploaded to GitLab repository “**FL-19**” into **main** branch.