



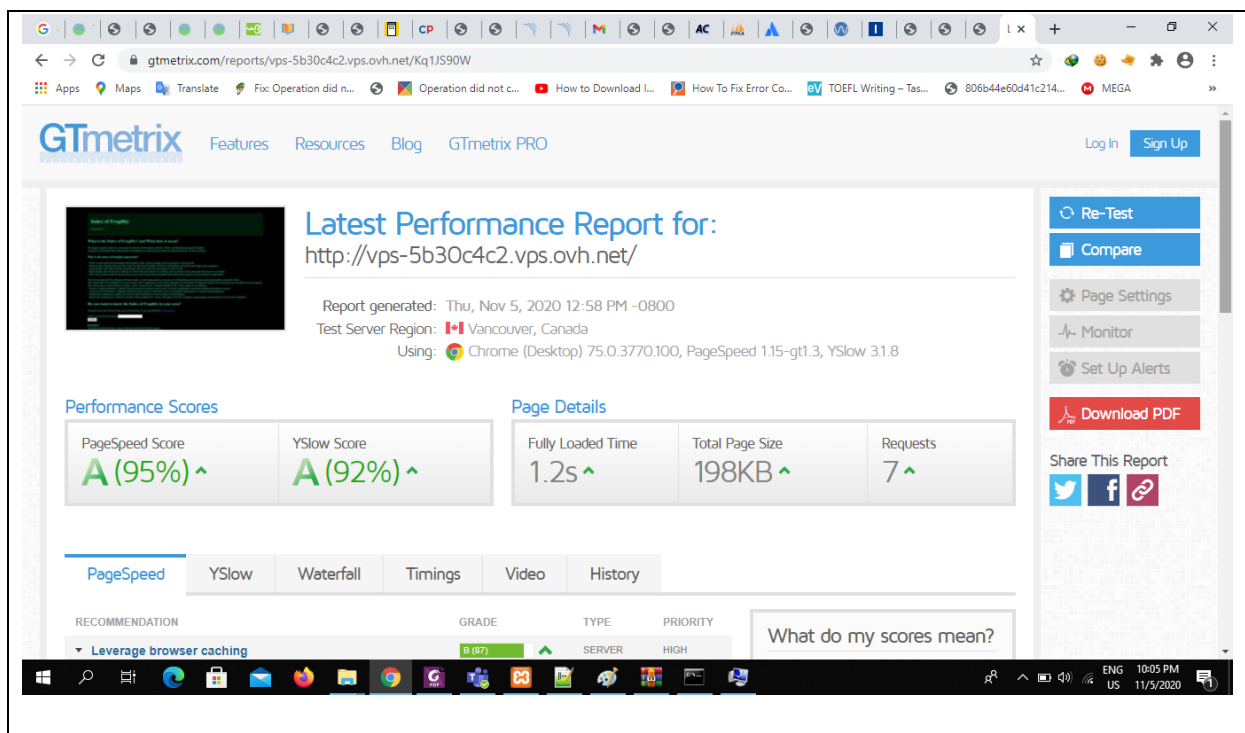
SYNTHESE DU PROJET CHALLENGE DESIGN4GREEN 2020 REPORT

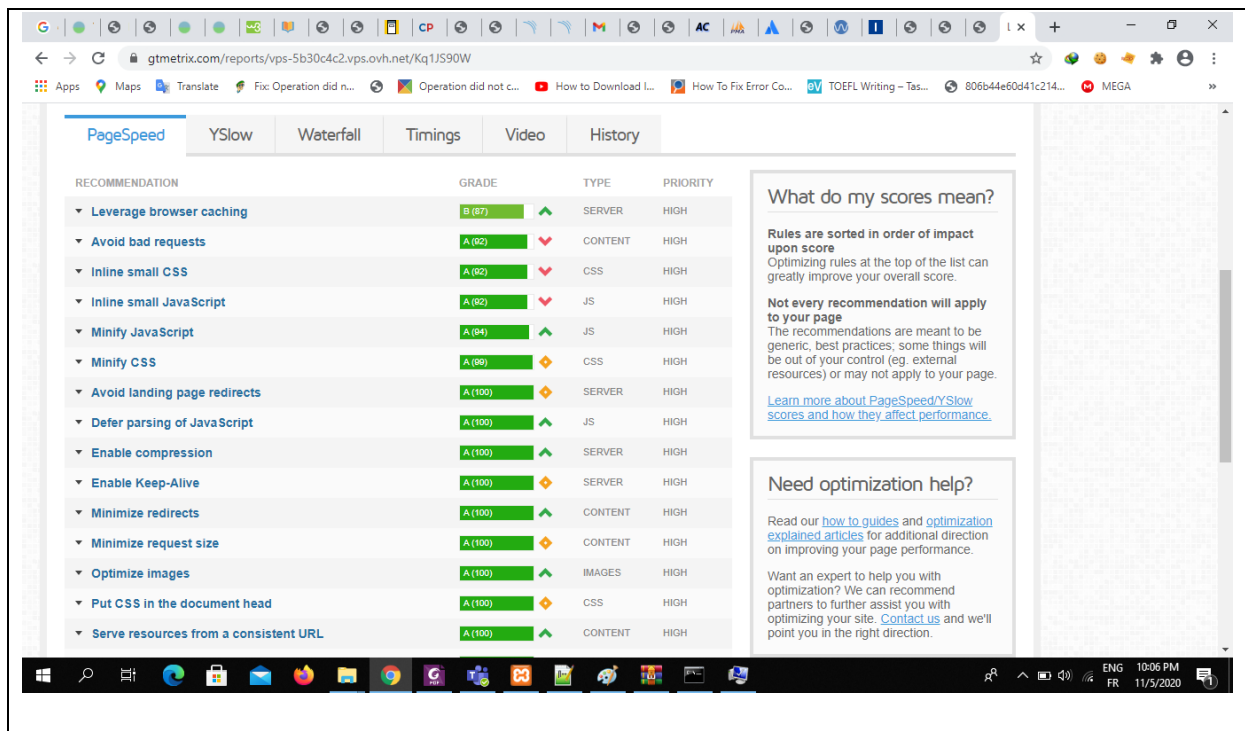
Numéro d'équipe / Team Number : 19

GT MTERIX

SCORE (PageSpeed Score) : 95 % (only percentage)

SCREENSHOT (with Day and time)

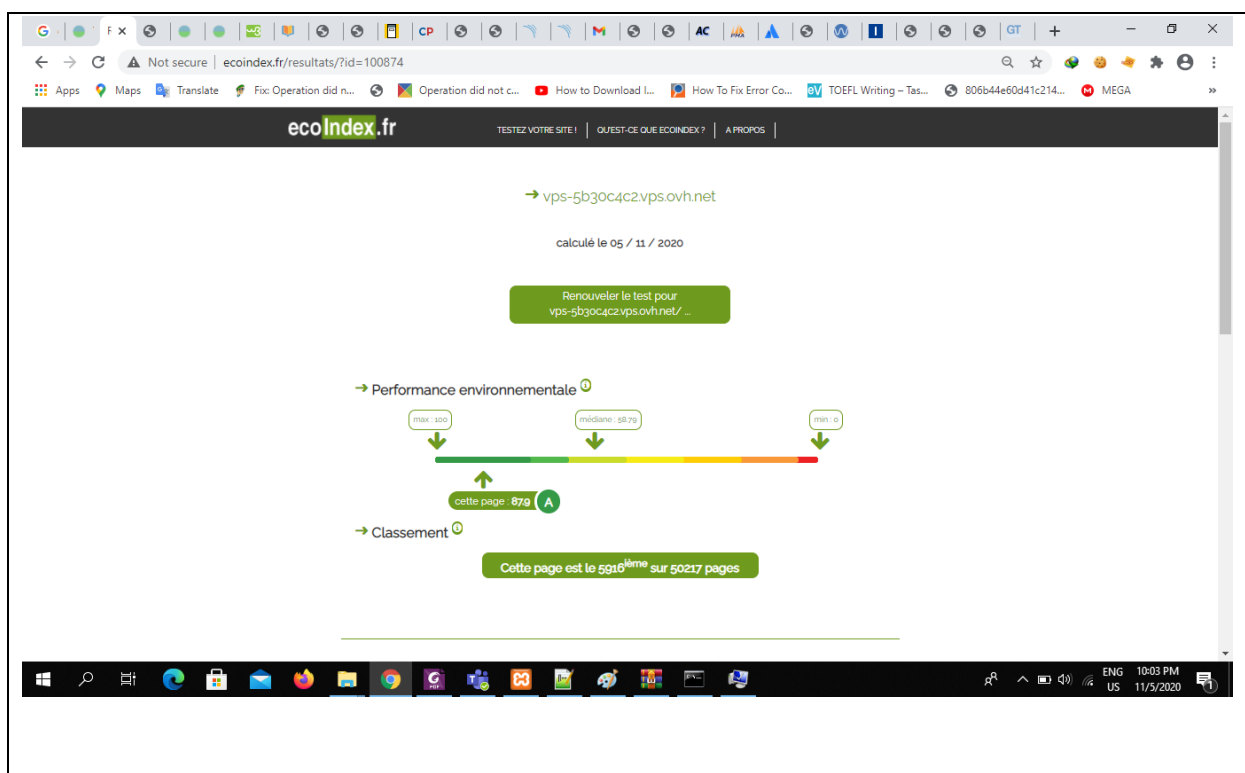


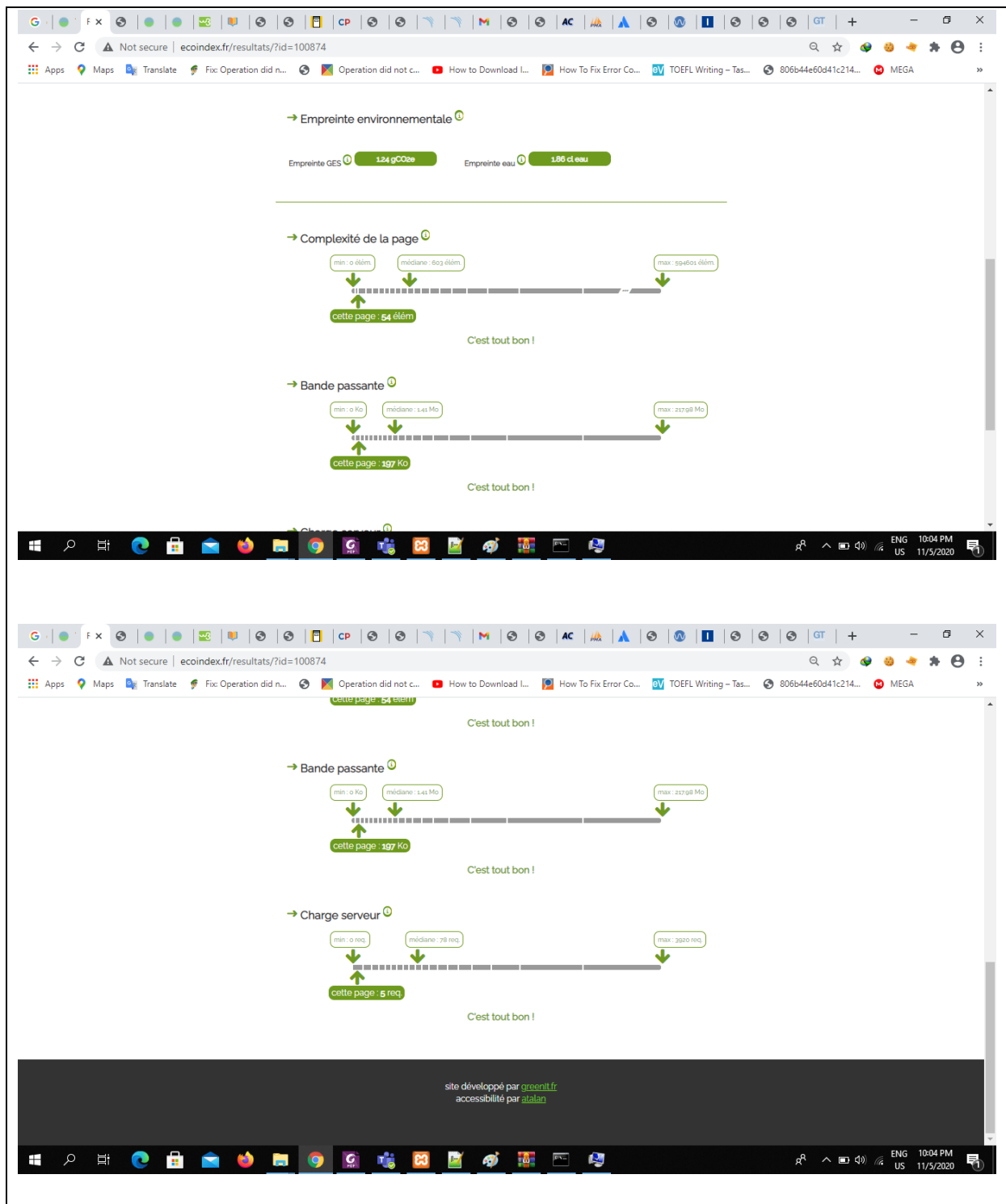


ECOINDEX

SCORE (Performance environnementale / Environmental performance) : 87.9/100

SCREENSHOT (with Day and time)

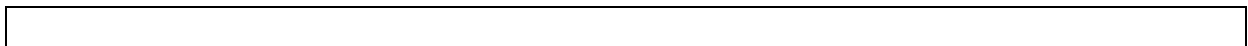


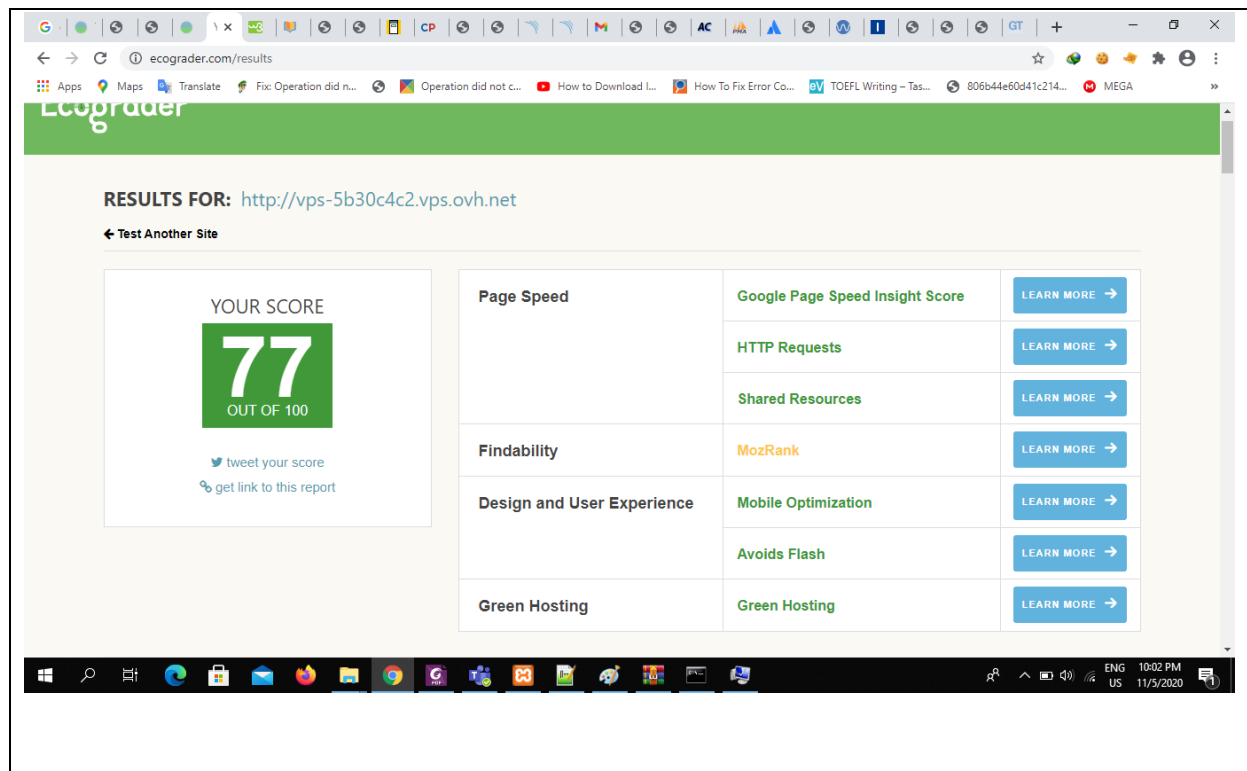


ECOGRADER

SCORE : 77 / 100

SCREENSHOT (with Day and time)





SONARQUBE

GITHUB URL : https://github.com/josuebecerra7/Hackaton_Design4Green

Conception générale – General conception

Avez-vous réussi à finaliser votre projet ? Did you manage to finish your project ? Oui Yes

Si non, pourquoi et quels éléments sont manquants ? if not, why and what is missing ?

Yes we managed to complete all the tasks with slight alterations to make our application energy efficient.

Conception technique – Technical conception

Quel langage avez-vous choisi et pourquoi ? which language did you use and why ?

FrontEnd : we used HTML for most of the front end to make the webpage as light as possible. The use of CSS was minimized because of its negative impact on the environmental performances. JavaScript was a must for the page interactivity but its utilization was very limited.

BackEnd : The data was first stored as csv dataset and the connection frontEnd – BackEnd was established using the latest version of PHP 7.4 which is considered faster and also uses fewer server resources and therefore less energy.

Source article :

https://www.researchgate.net/publication/321415912_Analyzing_Programming_Languages%27_Energy_Consumption_An_Empirical_Study

Although C, C++, and Java represent more efficient program languages, we found that they can be more time consuming regarding the adaptation with the web development environment. Since we are constrained with 48 hours, we decided to maintain our backend with PHP.

Comment avez-vous optimisé vos requêtes ? How did you optimize the query ?

Dataset :

We started by reorganizing the data from the different presented links, and thus obtained a large dataset of 336MB that contained all information.

We used Irises' information to create the 4 indexes of each commune and its global score in order to reduce number of variables to handle.

Next step was to optimize this dataset by maintaining the most important entities (commune code, name of commune, global score, the 4 indexes, the region name/score..). This transformation of data allowed to have a greatly reduced version of the dataset of 6.5MB which means that we reduced data size to a ratio of 51 times less compared to the original version.

Management :

We decided to use MySQLi or PDO_MySQL extensions for accessing and managing the content of our dataset since both are recommended for data managing.

Source : <https://www.php.net/manual/en/mysqlinfo.api.choosing.php>

Conception fonctionnelle – Functional conception

Avez-vous choisi d'utiliser un outil de représentation graphique ? Did you use a graphical representation ?

Non No

Si oui pourquoi ? if yes, why ?

Si non pourquoi ? if not Why ?

We decided to not use the graphical representation because:

For maps: using a map requires the gps coordinates of each commune which is for 1 commune:
 $2 * \text{float} = 2 * 32\text{bits} = 2 * 4 \text{ bytes} = 8 \text{ bytes}$

Note that we have more than 35329 communes which means we need more memory and more energy consumption.

Also the display of the map or any graphical data (images, videos...) is not energy efficient since any graphical representation is at least a 2D matrix(huge amount of data) that must be uploaded/embedded from somewhere, thus we decided not to not use any.

Design

Expliquez en quelques mots les choix réalisés au niveau du design du site? Explain your design choices ?

For the frontEnd we opted for a simple design of a dark mode, with system fonts (no need to load new fonts on the user's device), avoiding any bootstrap or Bulky libraries that would make our webpage slow or more energy consuming. We wrote manually the minimum of the css and javascript necessary.

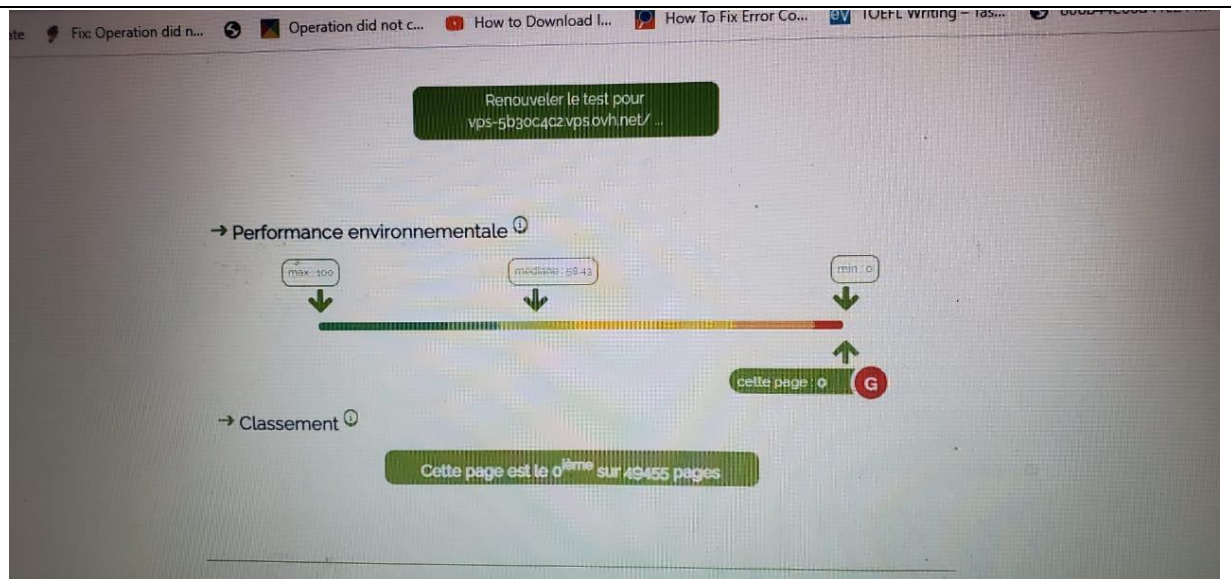
For the application usage, we opted for an input button where the user can type the commune code, submit and the results will be displayed accordingly. The input button allows to get directly the commune code which we match with the right row in dataset and display the information needed with an interpretation.

We note that we first used the dropdown of the communes' names, which was a long list of name and made the website very laggy (the uploading of the list took around 7s).

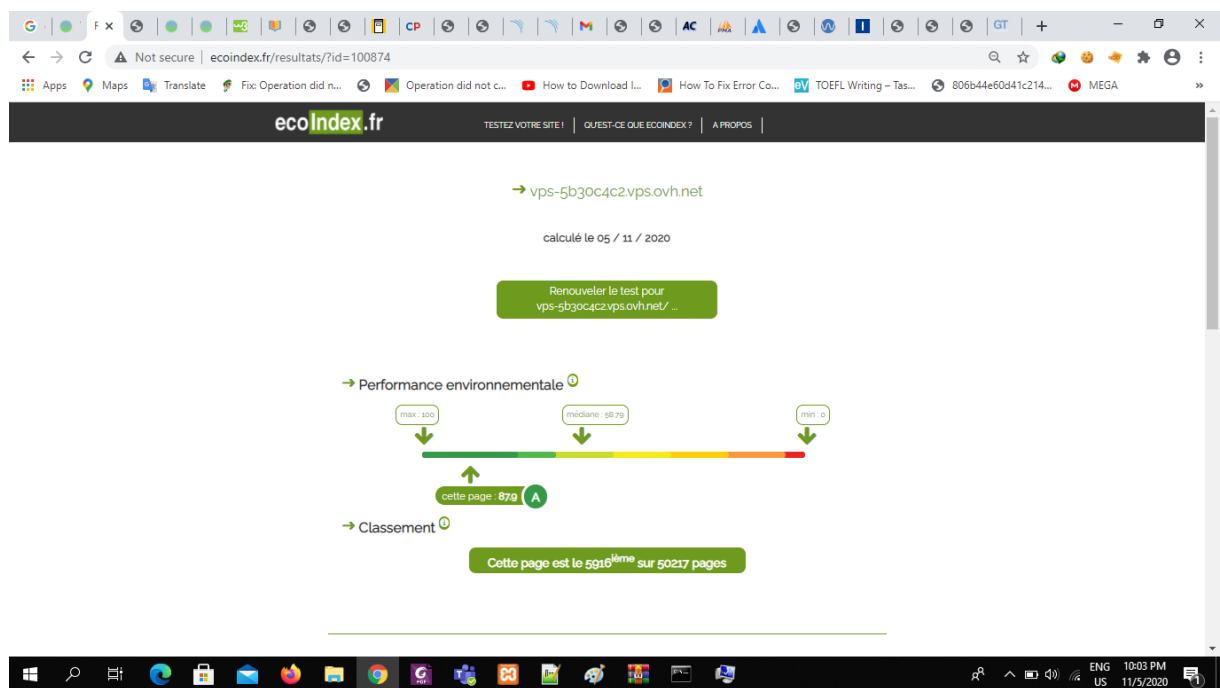
A second try was to use the postal code, however, multiple communes can have the same postal code and the arrangement of the data variables retrieved from the given site (INR) did not allow the usage of this variable.

The proposed solution (commune code) allowed the improvement of our environmental performances from 0% to 87.6% as shown in the following figures:

With the dropdown :



With the commune code input :



Furthermore, No user session is stored and no cookies are involved therefore the website complies with the GDPR (General Data Protection Regulation).

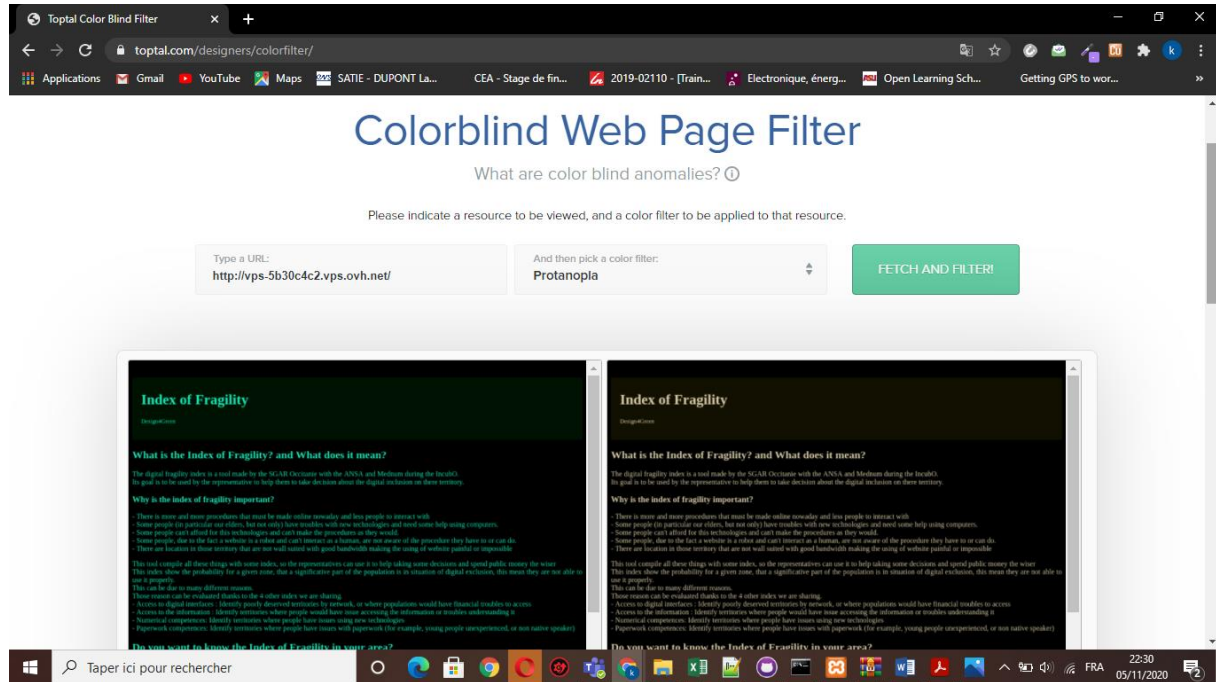
A button to download the pdf version of results was added. The PDF contains the table of results with an interpretation.

Accessibilité

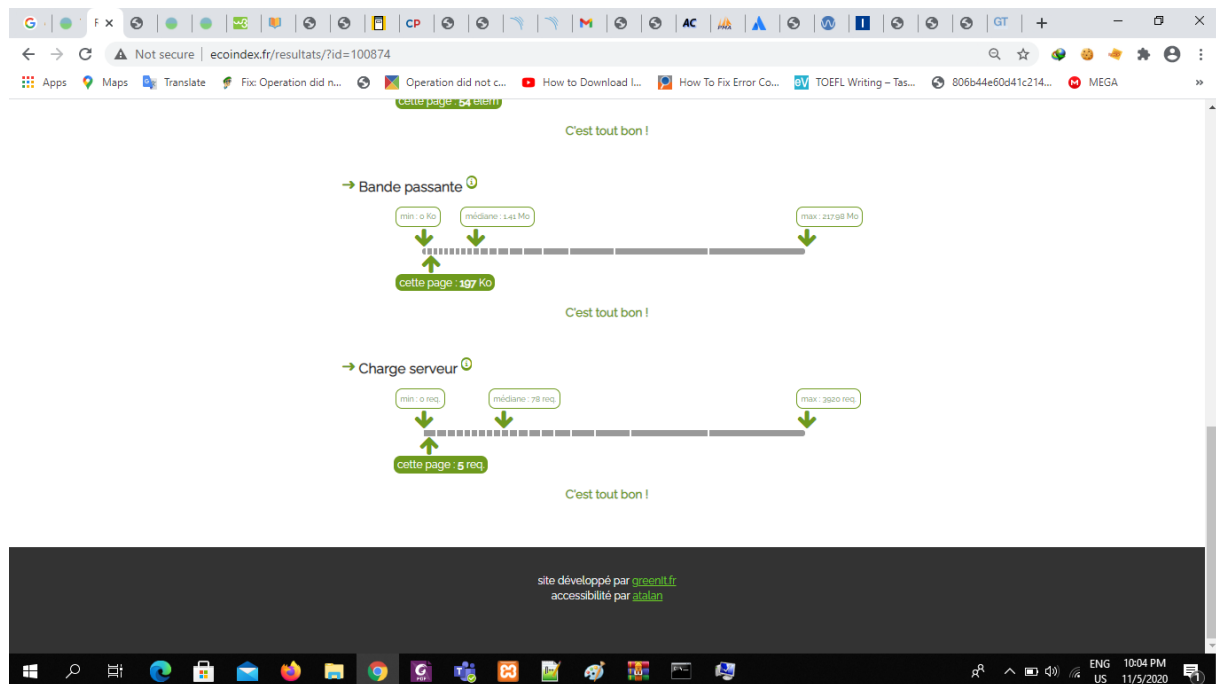
Qu'avez-vous mis en place pour le respect de l'accessibilité du site? How did you manage the accessibility of your site ?

Our website is optimized for mobile use and is of a very simple functional design. To prove that, we made some tests for accessibility for people with physical disabilities (color blind) and we tested the band width, the response speed and Contrast of our website.

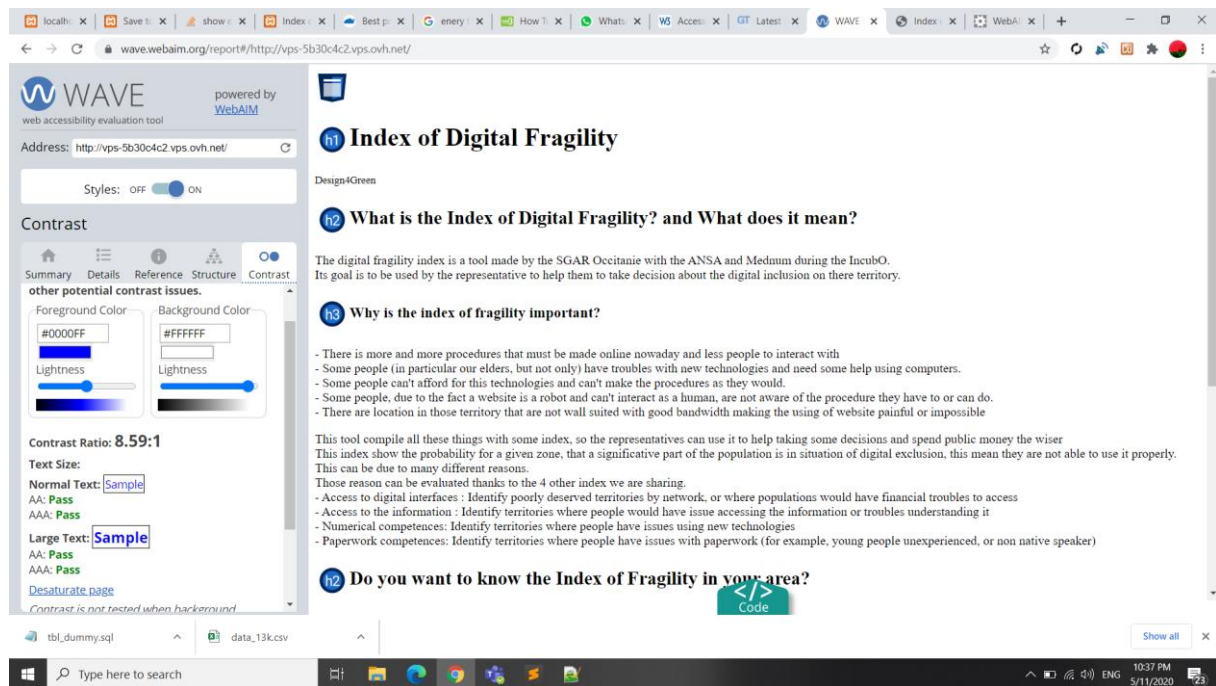
-Color blind test :



-bandwidth :



-Contrast test



QUESTIONS GÉNÉRALES – GENERAL QUESTIONS

Qu'est ce qui fait que votre site est éco-conçu? Why your solution is ecodesign ?

The site can be considered as eco-design for the following reasons :

- Simple neat frontEnd design to minimize the energy consumption.
- Minimal use of CSS and javaScript.
- Opting for omitting the dropdown list/postal code and therefore making the site faster and less energy consuming. It furthermore provided better user experience.

Avez-vous d'autres remarques pertinentes sur votre projet ? others comments on your project ?

Task 7 :

We achieved this task by registering the request using its id(commune code) on another table in the database. (Accessible to only the admin)

task 4-b:

Creating another storage unit (more memory) for the already called requests would be more energy consuming than accessing the main data in our design. Therefore we decided to apply every request from the main dataset. This was a result of compromise between speed and energy efficiency.

The following schema represents the functional architecture of our website

