UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO

FACULTAD DE INGENIERÍA

SISTEMAS DISTRIBUIDOS

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GRUPO: 10

PROYECTO:

APLICACIÓN WEB (FULL STACK)

7 de diciembre del 2023
Semestre: 2024 – 1

EDUCATIONAL PLATAFORM

INTRODUCTION

This project is full application with microfrontends, microservices, an API developed on Python and a database provided by MongoDB

The fronend is developed using a micro frontend architecture and the NextJS framework. These consist of the next modules, each one of them is routed and enables navigation between them

- Catalog of available courses on the platform
- Individual page for each course
- Platform administration page
- Authentication and login
- User profile page

Functionally, the system aims to serve as an educational platform where people can create their own profile and register for different courses available on the platform. All the code for the API to connect this functionallity with the database where data is retrieved, was created using Python.

Finally, the database itself was designed as a No-SQL database, therefore it implemnts MongoDB as a Docker container configured to connect and work seamlessly with the platform

Following in this document, you Will find more information baout each one of the components, tolos and ujses of everything implemented in this project

FRONTEND

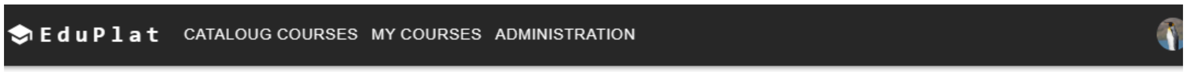
All the code for the views in this Project was developed using the following frameworks: NodeJS, React.js and Next.js, all with the porpousse to create a fast, responsive and manteinable web application. Those frameworks also ensure to be easier to learn and so to deploy the application in no time.

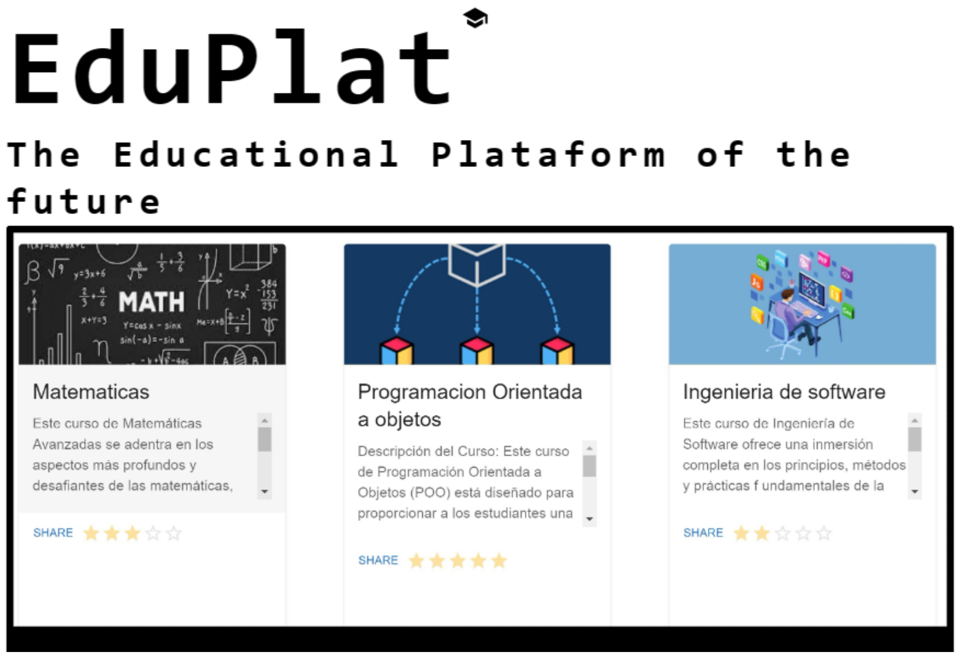
UI / UX

We used an independant framework for stylin and graphic design: MaterialUI, specifically the following modules: emotion/react, emotion/styled, mui/icons-material

HOME PAGE

Upon launching the application and after successfully logging in using any of the methods, this page appears.

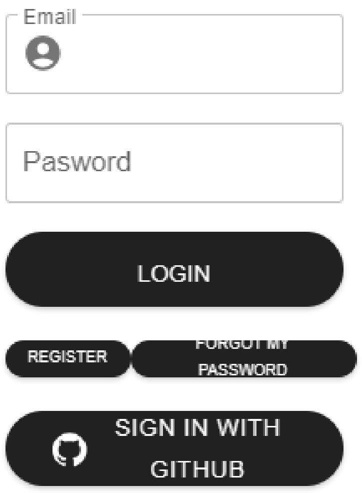


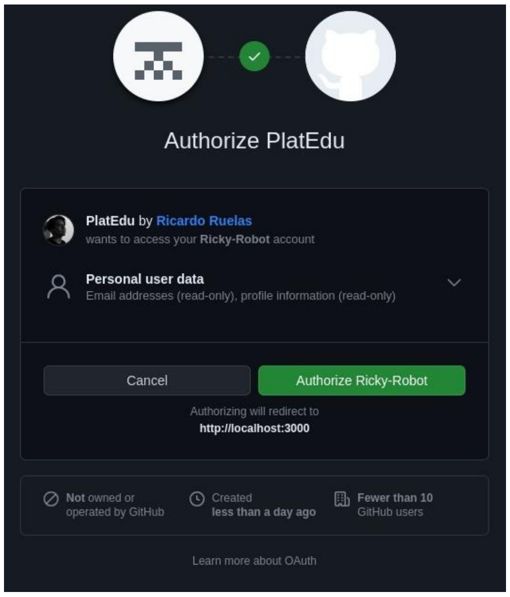

EduPlat
The Educational Plataform of the future
Matematicas
Este curso de Matemáticas Avanzadas se adentra en los aspectos más profundos y desafiantes de las matemáticas,
SHARE
Programacion Orientada a objetos
Descripción del Curso: Este curso de Programación Orientada a Objetos (POO) está diseñado para proporcionar a los estudiantes una
SHARE
Ingenieria de software
Este curso de Ingeniería de Software ofrece una inmersión completa en los principios, métodos y prácticas f undamentales de la
SHARE

AUTHENTICATION AND LOGIN

Authentication is implemented using two methods: a form requesting email and password, and through the GitHub API. Without successfully logging, the other functionalities of the application cannot be accessed. The respective code can be found in '**main/login/logingit/app/api/auth/[...nextauth]/route.js**', utilizing NextAuth.js and the mentioned providers as per the documentation provided on the page.

A local file named '**/.env.local**' is created to contain the API keys. This file must be included in the '.gitignore' file. It is necessary to configure the button in '**/components/signin-btn.jsx**' to enable the login functionality.




Authorize PlatEdu

PlatEdu by **Ricardo Ruelas**
wants to access your **Ricky-Robot** account

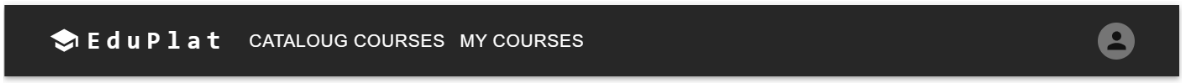
Personal user data
Email addresses (read-only), profile information (read-only)

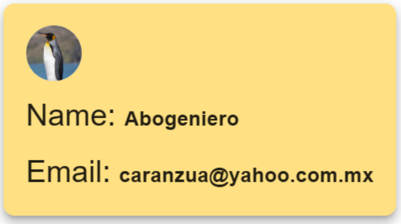
Cancel | Authorize Ricky-Robot

Authorizing will redirect to
http://localhost:3000

Not owned or operated by GitHub
Created **less than a day ago**
Fewer than 10 GitHub users

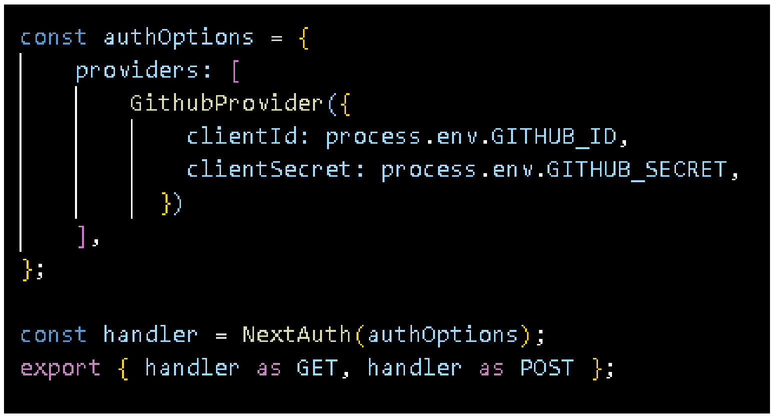
Learn more about OAuth


EduPlat CATALOUG COURSES MY COURSES


Name: Abogeniero

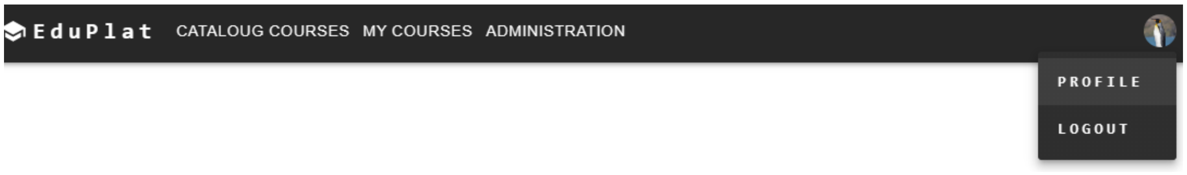
Email: caranzua@yahoo.com.mx

The functionality for logging in via GitHub is achieved with the following lines of code:


```
const authOptions = {
    providers: [
        GithubProvider({
            clientId: process.env.GITHUB_ID,
            clientSecret: process.env.GITHUB_SECRET,
        })
    ],
};

const handler = NextAuth(authOptions);
export { handler as GET, handler as POST };
```

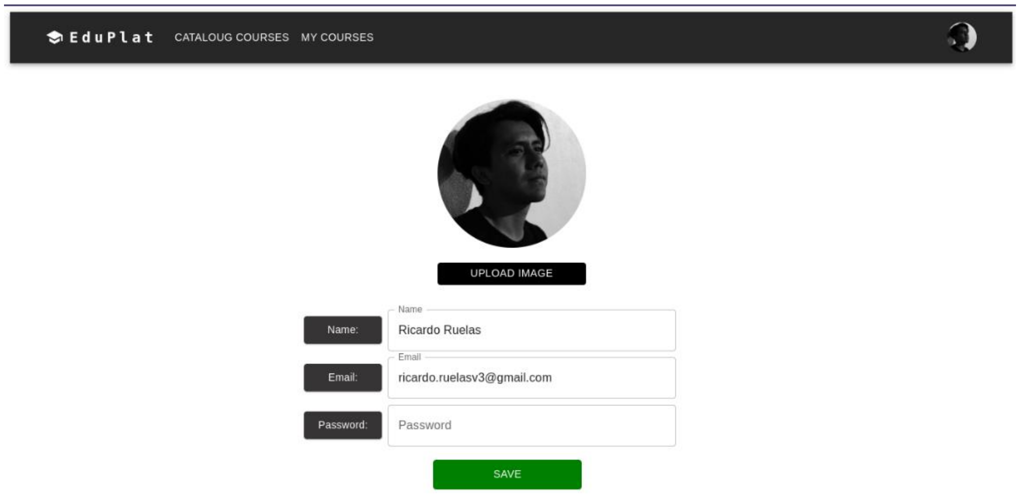
USER PROFILE

To access this view, it is necessary to click on the user's avatar, on the upper right cornero n the screen and then select 'Profile'.

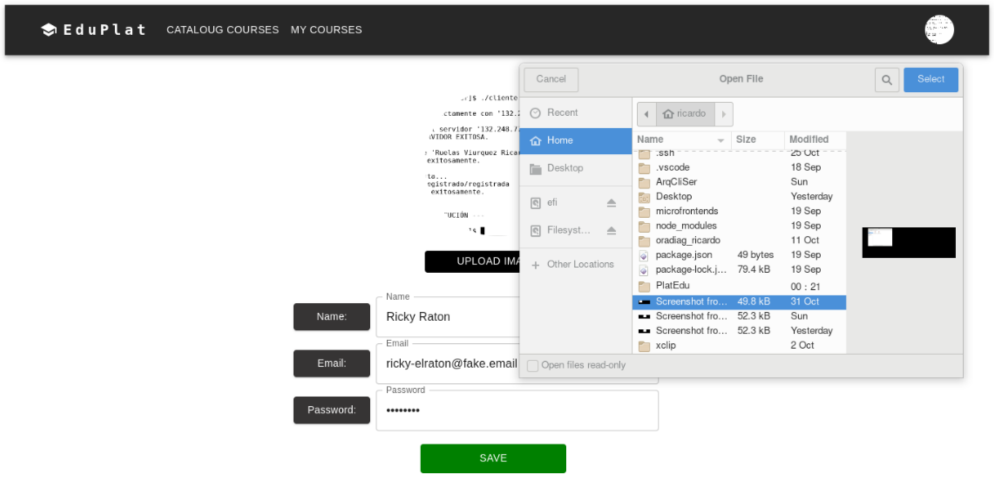


In addition to basic information (name, email, and password), this view includes the functionality to modify the profile image. Users can upload a new image using the operating system's file system interface and there's a button to save the information.

The default avatar is retrieved from the session generated by OAuth, along with the name and email.



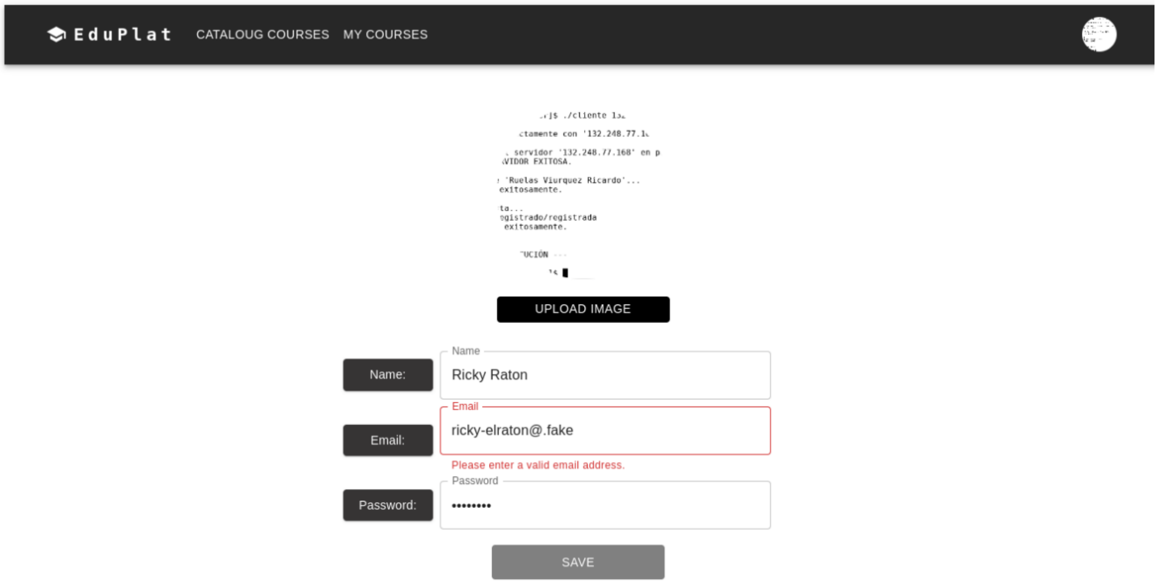
Name:	Name: Ricardo Ruelas
Email:	Email: ricardo.ruelasv3@gmail.com
Password:	Password



Name:	Name: Ricky Raton
Email:	Email: ricky-elraton@fake.email
Password:	Password: ••••••••

Name	Size	Modified
.ssh		25 Oct
.vscode		18 Sep
ArqCliSer		Sun
Desktop		Yesterday
microfrontends		19 Sep
node_modules		19 Sep
oradiag_ricardo		11 Oct
package.json	49 bytes	19 Sep
package-lock.j…	79.4 kB	19 Sep
PlatEdu		00 : 21
Screenshot fro…	49.8 kB	31 Oct
Screenshot fro…	52.3 kB	Sun
Screenshot fro…	52.3 kB	Yesterday
xclip		2 Oct

The email field already implements a validator



```
rj$ ./cliente 13

ctamente con '132.248.77.1

servidor '132.248.77.168' en p
VIDOR EXITOSA.

'Ruelas Viurquez Ricardo'...
exitosamente.

ta...
egistrado/registrada
 exitosamente.

UCIÓN ---

$ █
```

Name: Name Ricky Raton

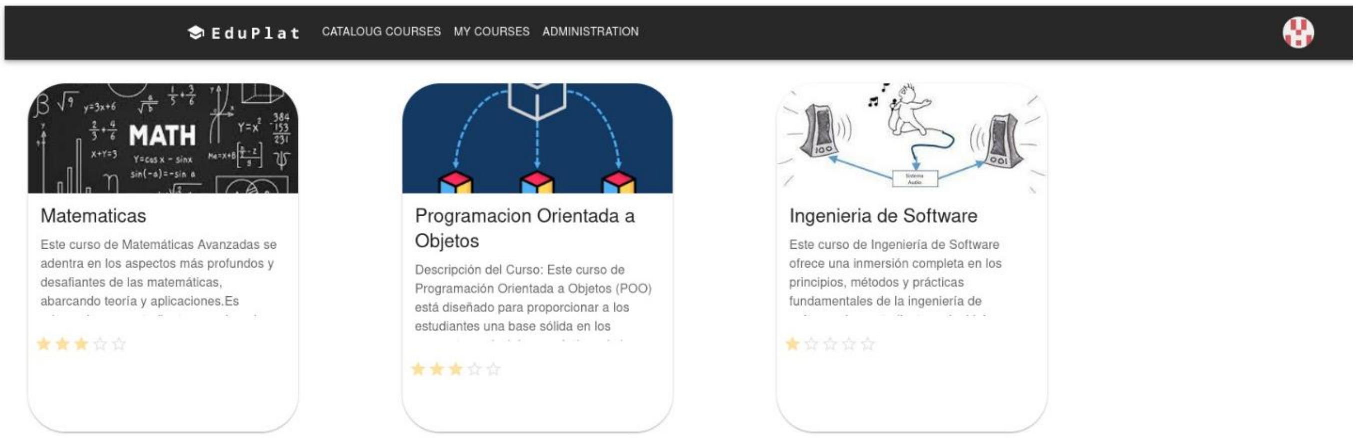
Email: Email ricky-elraton@.fake

Please enter a valid email address.

Password: Password ••••••••

COURSE CATALOG

In this view, the available courses for each user are displayed. There's a section to enter the keyword for the subject. In this platform, the keywords are: Mathematics, SoftwareEngineering, OOP and Math. The image below shows that all subjects have been added.



Matematicas

Este curso de Matemáticas Avanzadas se adentra en los aspectos más profundos y desafiantes de las matemáticas, abarcando teoría y aplicaciones.Es

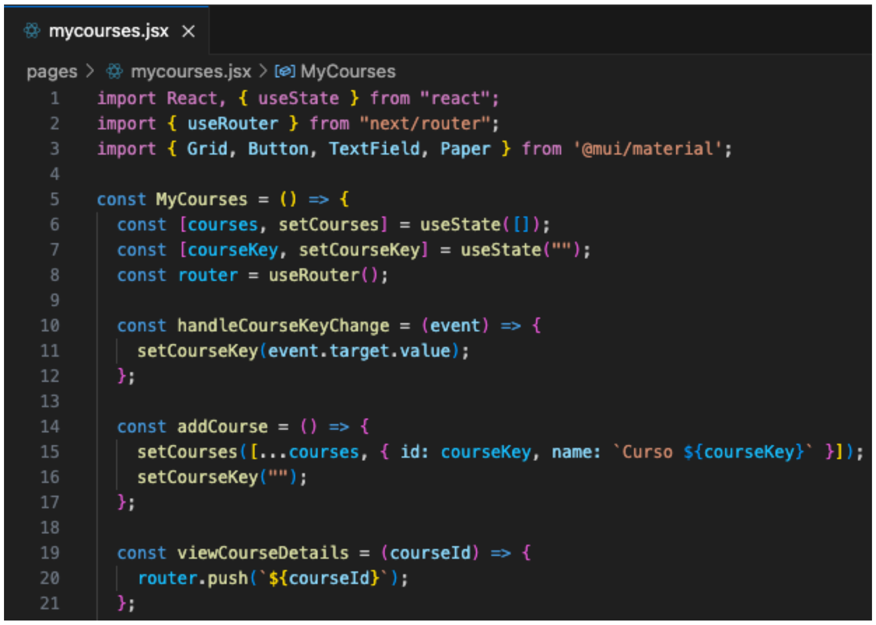
Programacion Orientada a Objetos

Descripción del Curso: Este curso de Programación Orientada a Objetos (POO) está diseñado para proporcionar a los estudiantes una base sólida en los

Ingenieria de Software

Este curso de Ingeniería de Software ofrece una inmersión completa en los principios, métodos y prácticas fundamentales de la ingeniería de

The part of the code that enables this functionality is:

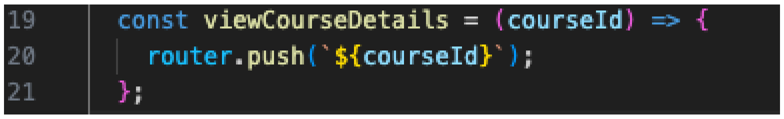


```
import React, { useState } from "react";
import { useRouter } from "next/router";
import { Grid, Button, TextField, Paper } from '@mui/material';

const MyCourses = () => {
  const [courses, setCourses] = useState([]);
  const [courseKey, setCourseKey] = useState("");
  const router = useRouter();

  const handleCourseKeyChange = (event) => {
    setCourseKey(event.target.value);
  };

  const addCourse = () => {
    setCourses([...courses, { id: courseKey, name: `Curso ${courseKey}` }]);
    setCourseKey("");
  };

  const viewCourseDetails = (courseId) => {
    router.push(`${courseId}`);
  };
```

Where the dependencies of React, useState, Next.js utilities, and Material UI are exported, local state is utilized to store the list of courses (courses) and the current course key (courseKey). Additionally, the Next.js router object is obtained.

An addCourse function is defined to add a course to the list of courses.

A viewCourseDetails function is defined to navigate to the details of a specific course.



```
const viewCourseDetails = (courseId) => {
  router.push(`${courseId}`);
};
```

APPLICATION PROGRAMMING INTERFACE

Each API is developed usign Python and its module Flask.

We developed four API, one for each module that the frontend has, thus there is an API for the catalogo courses, another for each one of the specific course, one for the login and last one for the profile of each user.

DATABASE

Due to the initial requirement of creating a distributed system, it is necessary to implement a NoSQL database, for which MongoDB was chosen.

In our database, we store information about the users registered on the platform, which is retrieved specifically for each user during their session. Additionally, we store information regarding the available courses, which is referenced when displayed in the catalog as well as in a particular view on a page when a specific course is queried.

FRAMEWORKS, TOOLS AND VERSIONS

Throughout this project, various technologies have been utilized, spanning multiple programming languages and smaller frameworks. Below is a detailed, though not exhaustive, list of the main tools implemented

PROGRAMMING LANGUAGES

- Python 3.10: used for the development of the API and connection trough the database
- JavaScript ECMAScript 2021: not used in raw code, but in the framework NodeJS and thus trough all the frontend

FRAMEWORKS

- NodeJS v.20.10.0
- React v.18.1
- Next.js v.14.0.1
- MaterialUI v.5.0.6
- NextAuith v.4.24.5

PYTHON MODULES

- Flask v.3.0
- MarkupSafe v.2.1.3
- Pymongo v.4.6.1

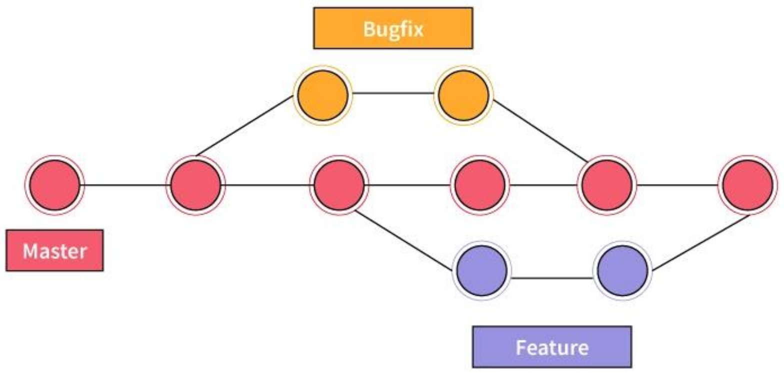
OTHER UTILITIES

This Project was developed by a team of 7 members, each one of them was using a Fedora 38 Workstation, working on both local and remote repository provided by GitHub; andthe Git versión is 2.43.0

Docker, for the attempt to create the several conteiners for the microfrontends, as well for the database MongoDB, all the developers installed the versión 24.0.6. And, using this technology, we pull de container “mongo”, versión 3.1 and for the easiest creation and manipulation of the data, Mondo Compass.

GIT BRANCH STRATEGY

The Feature-Based branch strategy involves creating separate branches for each new feature or functionality, allowing independent tracking and development of each part of the project before merging it into the main branch. This facilitates collaboration between teams and version control, maintaining a modular and organized approach to development.



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GitHub, NextAuth.js. Available in: [https://next-auth.js.org/providers/github], October, 29,2023

Google, NextAuth.js. Available in: [https://next-auth.js.org/providers/google], October, 29, 2023

Mongo, DockerHub. Available in [https://hub.docker.com/_/mongo], November, 12, 2023.