Web Application using Google OAuth

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Assignment 2 of IE5042 - Software Security is submitted as a partial requirement of the module to tested the knowledge in OAuth 2.0 framework

M.Sc. in IT (Specialized in Cyber Security)

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Introduction about the system

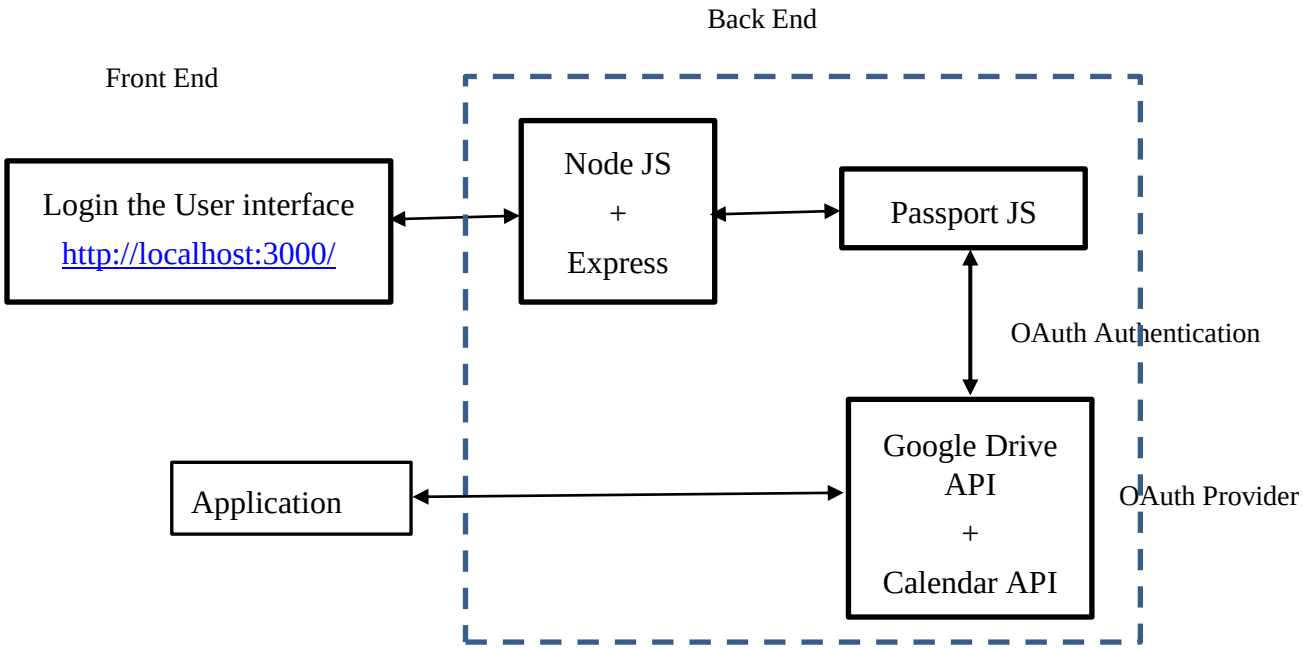
Our application has been developed by using the NodeJS server side Programming Language. This application uses the google OAuth for user authentication. It expresses the knowledge of OAuth 2.0 frame work and provides followings services.

- Retrieve the User profile name
- Upload the files to the google drive
- View the upcoming event to schedule the google calendar

OAuth Authentication

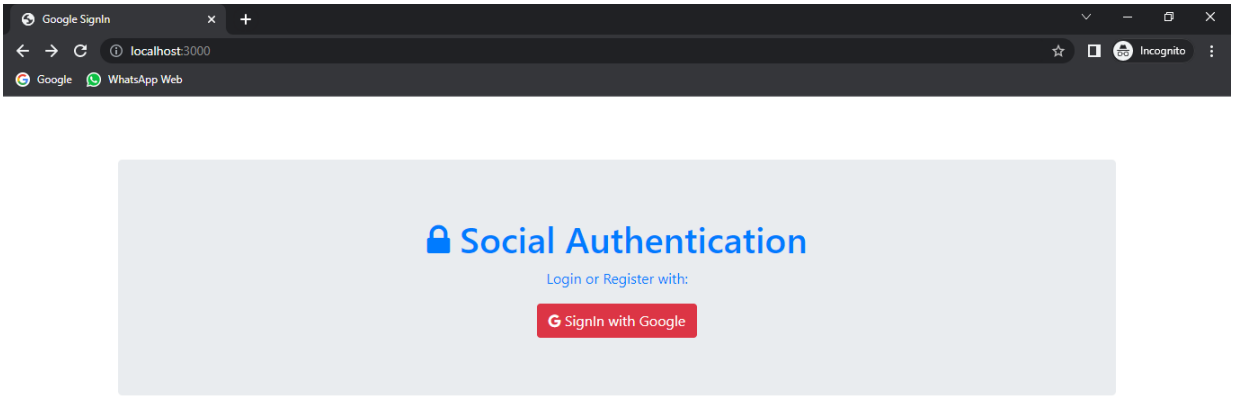
OAuth stands for "Open Authorization," and it's usually used to allow access to a collection of resources, such as distant APIs or a user's data. OAuth 2.0 gives approved access and limits what the client app may do on behalf of the user's resources without ever disclosing the user's credentials. Although it does not provide a precise format for Access Tokens. However, in some contexts, the JSON Web Token (JWT) format is often used

Architecture Diagram

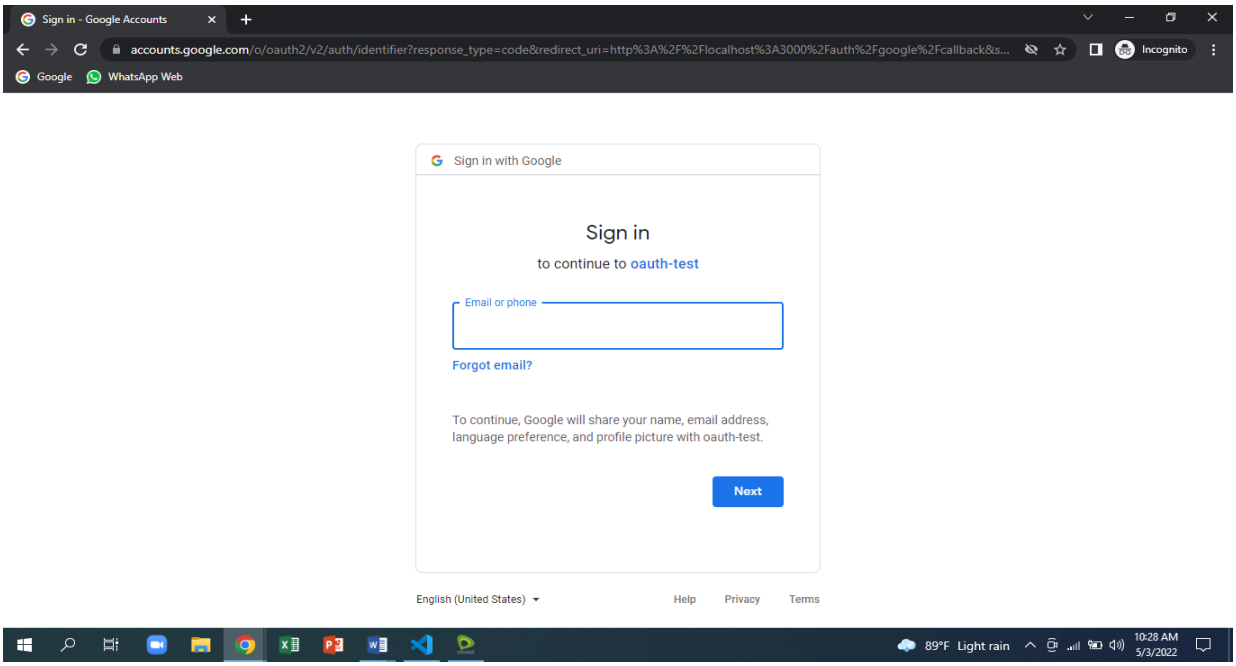


Service 1 : Retrieve the User profile name

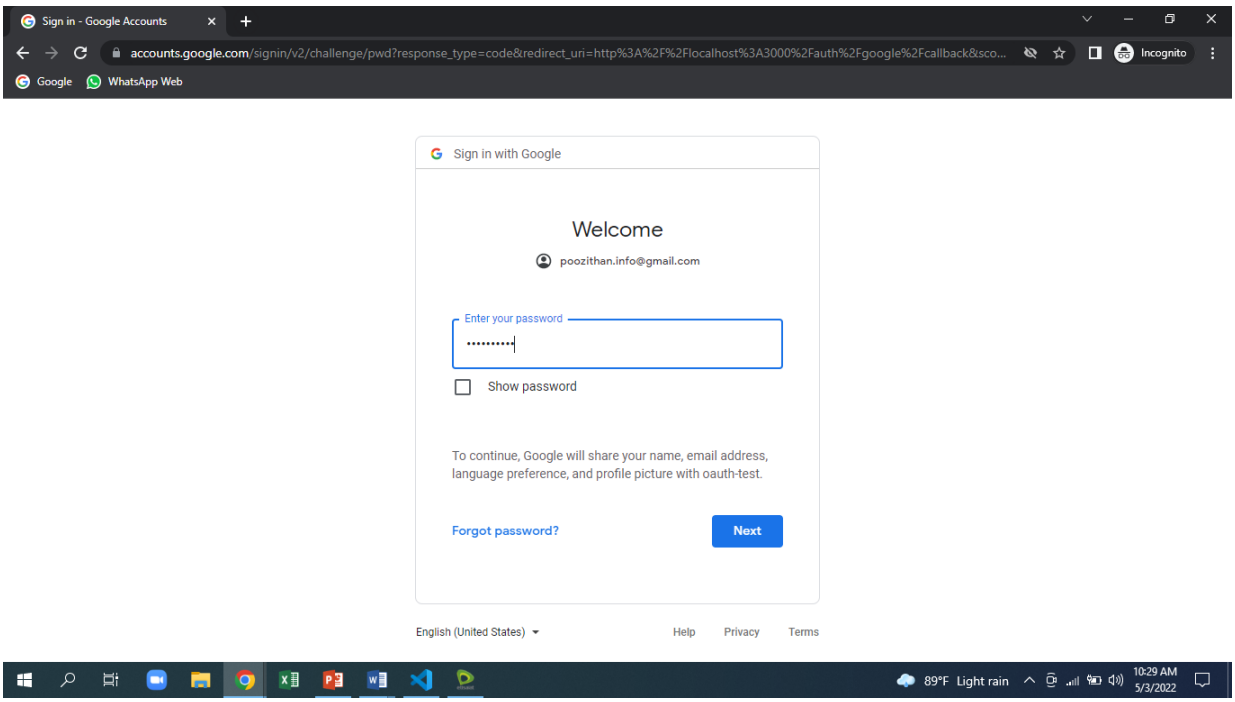
- Go to the Google chrome browser and type “localhost:3000” in the URL bar, the below page will be loaded



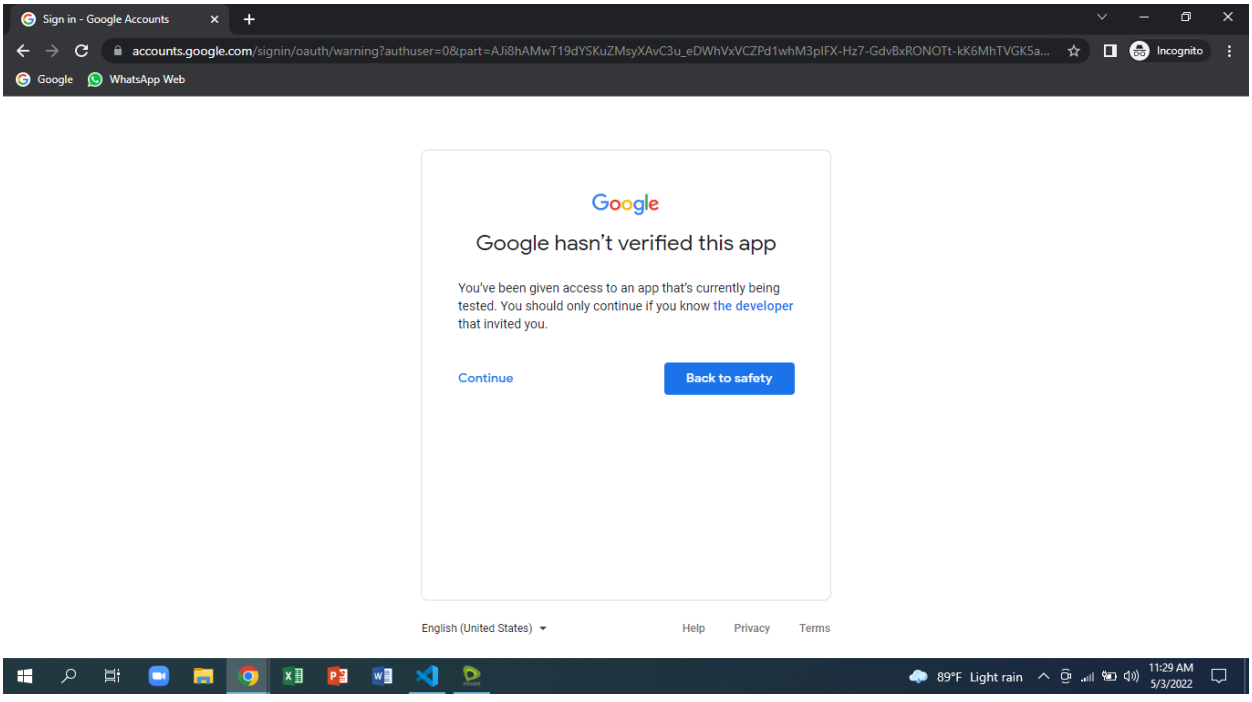
- Click the “Sign in with Google” Button the below page will be loaded.

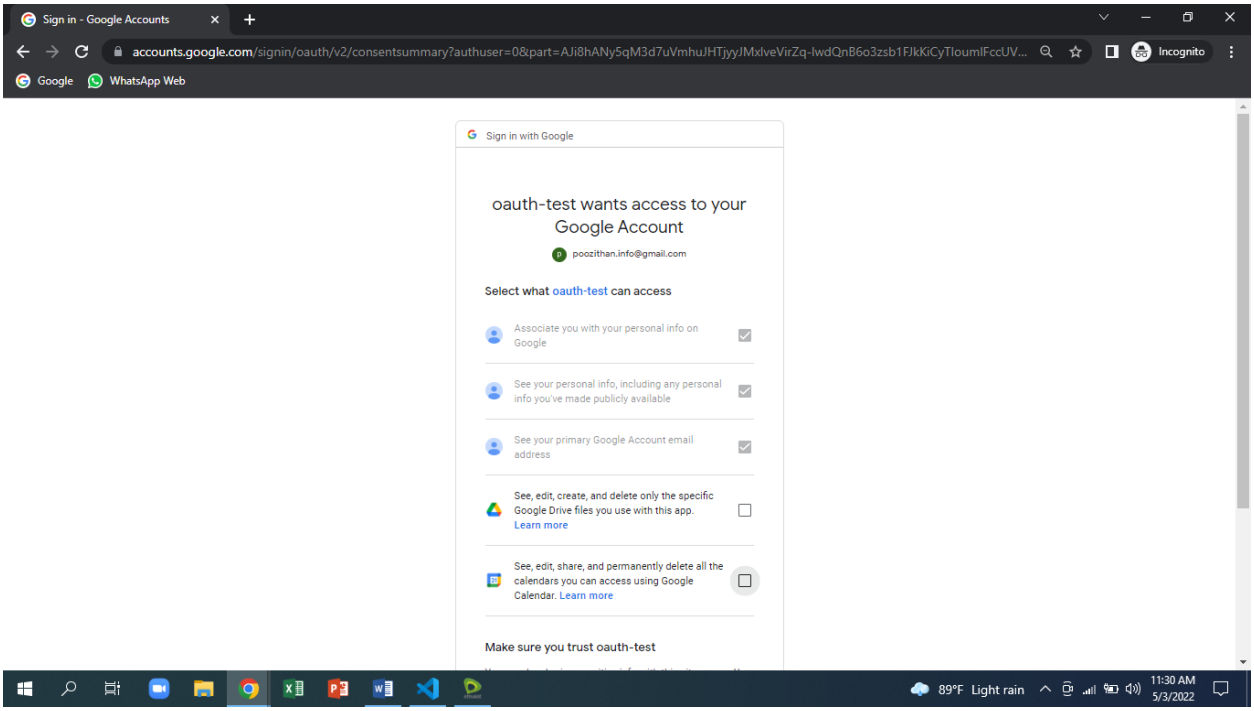


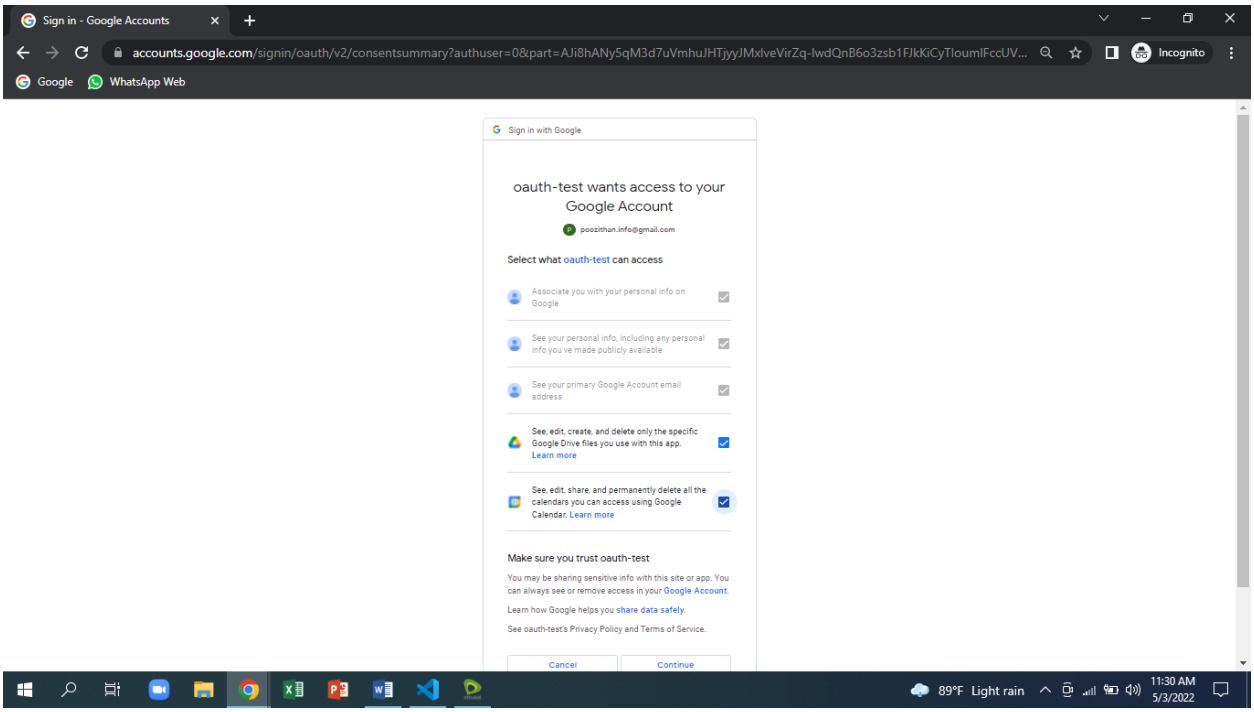
- Enter User name and password, the page will be redirect to the authentication via Google authentication



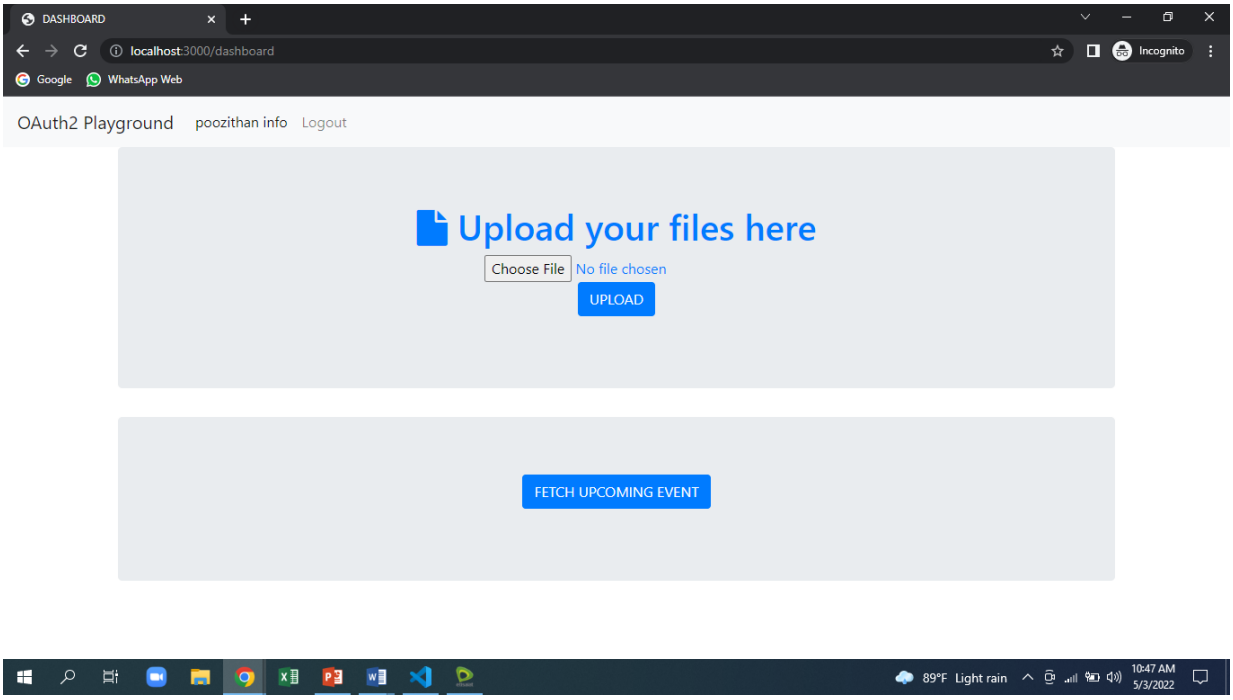
- Once user enter the user credentials, it redirect to the authentication process and user allow to access the google account




Sign in - Google Accounts
accounts.google.com/signin/oauth/v2/consentsummary?authuser=0&part=AJi8hANy5qM3d7uVmhuJHTjyyJMxlveVirZq-lwdQnB6o3zsb1FJkKiCyTloumlFccUV...
Incognito
Google
WhatsApp Web
Sign in with Google
oauth-test wants access to your Google Account
poozithan.info@gmail.com
Select what oauth-test can access
Associate you with your personal info on Google
See your personal info, including any personal info you've made publicly available
See your primary Google Account email address
See, edit, create, and delete only the specific Google Drive files you use with this app. Learn more
See, edit, share, and permanently delete all the calendars you can access using Google Calendar. Learn more
Make sure you trust oauth-test
89°F Light rain
11:30 AM
5/3/2022

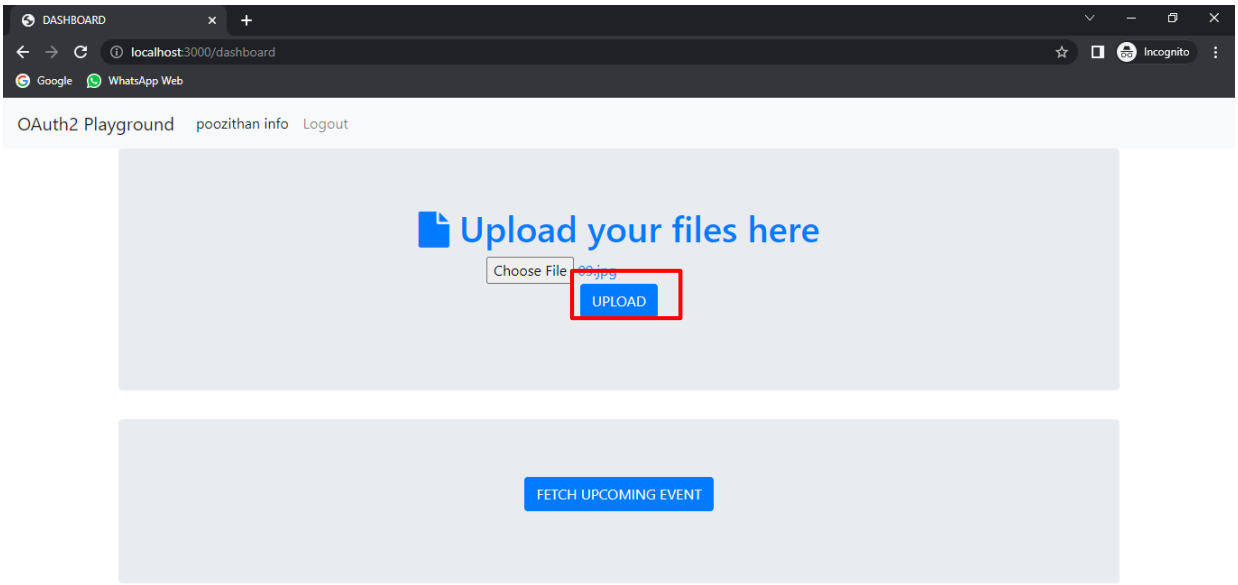

Sign in - Google Accounts
accounts.google.com/signin/oauth/v2/consentsummary?authuser=0&part=AJi8hANy5qM3d7uVmhuJHTjyyJMxlveVirZq-lwdQnB6o3zsb1FJkKiCyTloumlFccUV...
Incognito
Google
WhatsApp Web
Sign in with Google
oauth-test wants access to your Google Account
poozithan.info@gmail.com
Select what oauth-test can access
Associate you with your personal info on Google
See your personal info, including any personal info you've made publicly available
See your primary Google Account email address
See, edit, create, and delete only the specific Google Drive files you use with this app. Learn more
See, edit, share, and permanently delete all the calendars you can access using Google Calendar. Learn more
Make sure you trust oauth-test
You may be sharing sensitive info with this site or app. You can always see or remove access in your Google Account.
Learn how Google helps you share data safely.
See oauth-test's Privacy Policy and Terms of Service.
Cancel
Continue
89°F Light rain
11:30 AM
5/3/2022

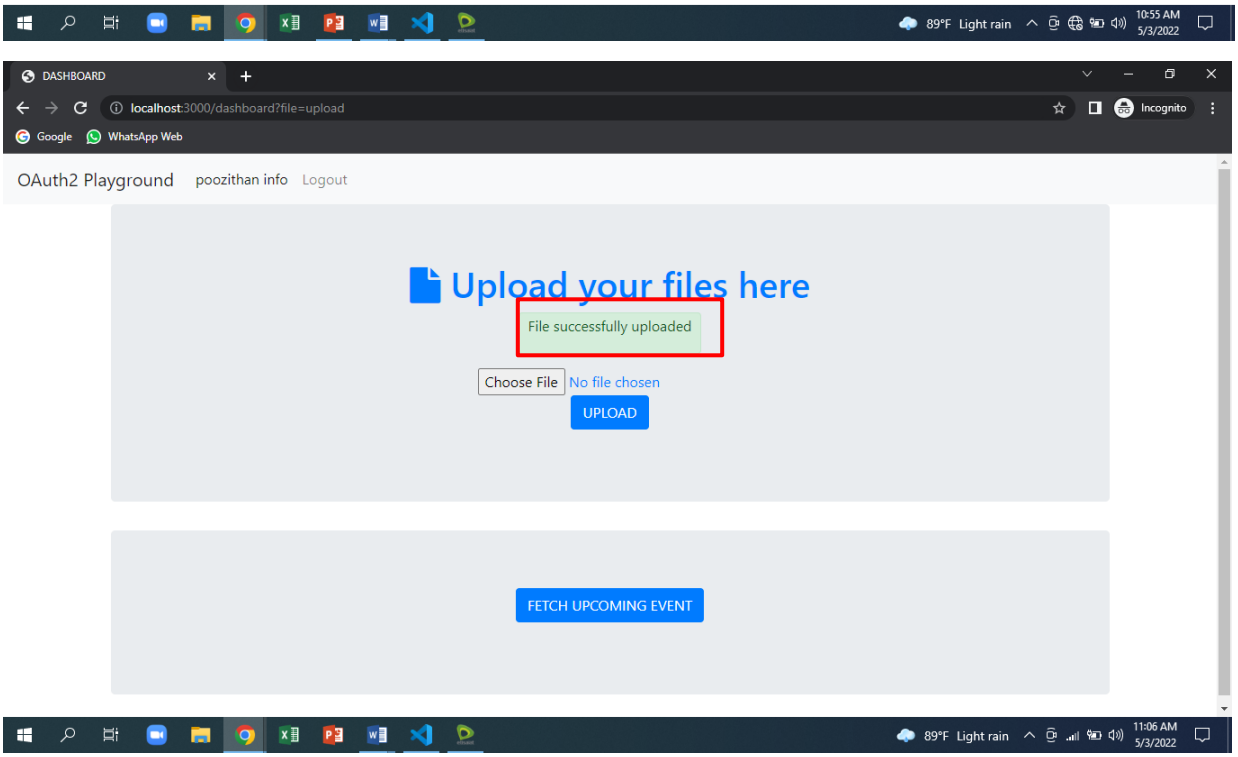
- After the authentication process, the main page will be loaded.



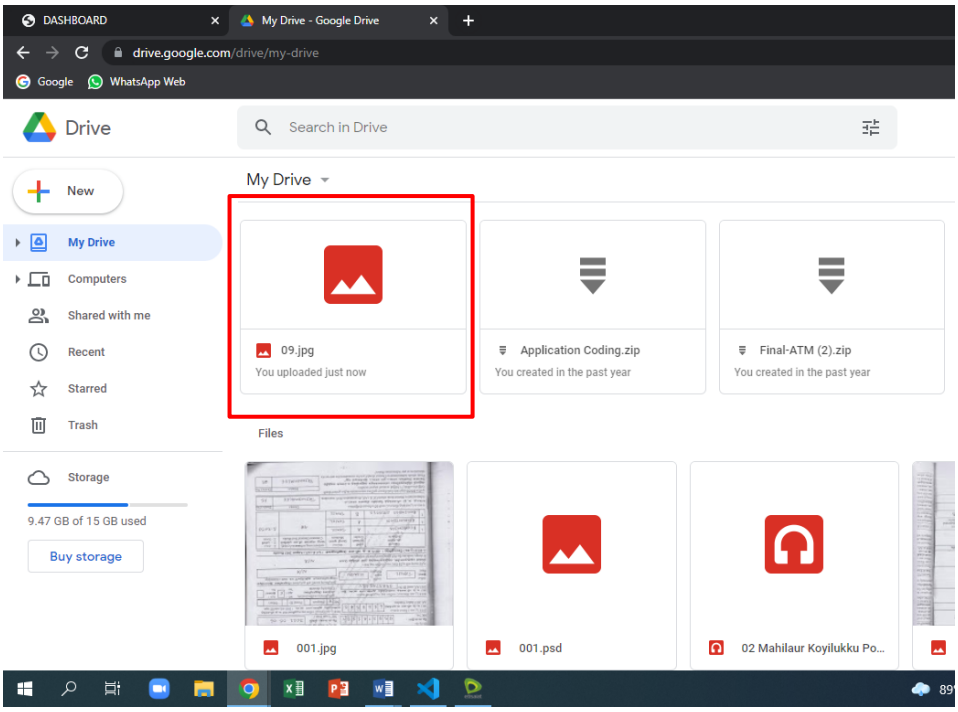
Service 2 : Upload the files to the google drive

- If you want to upload the files, click the “Choose file” button icon and select the files from your device. After the selection of files, click the upload button. Once the uploading completed, ou will receive the message “File successful uploaded”



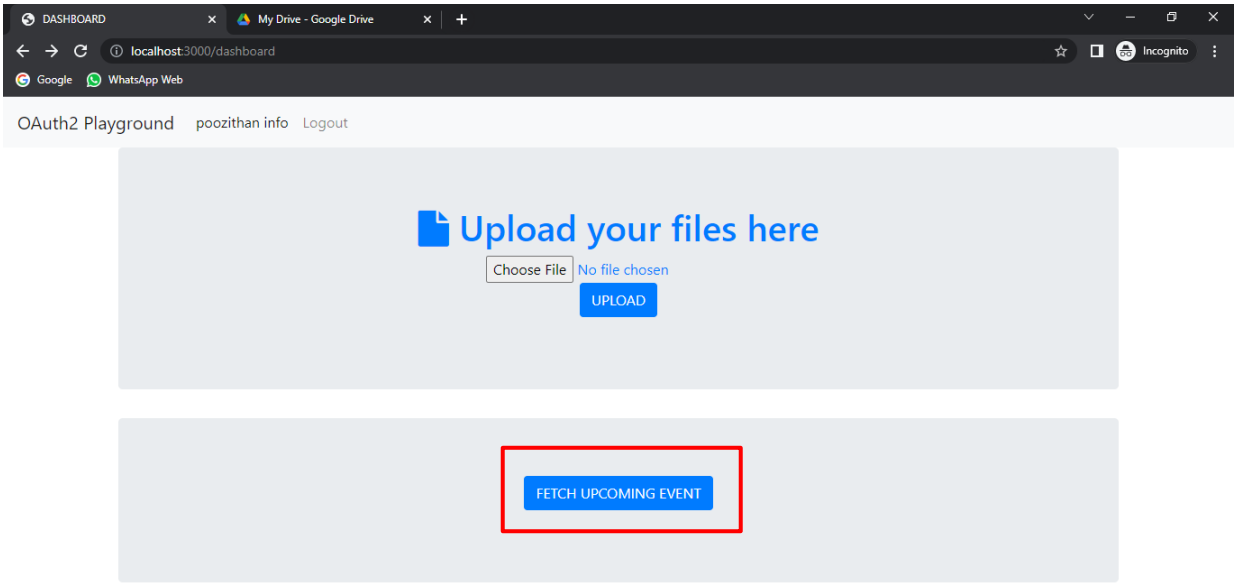


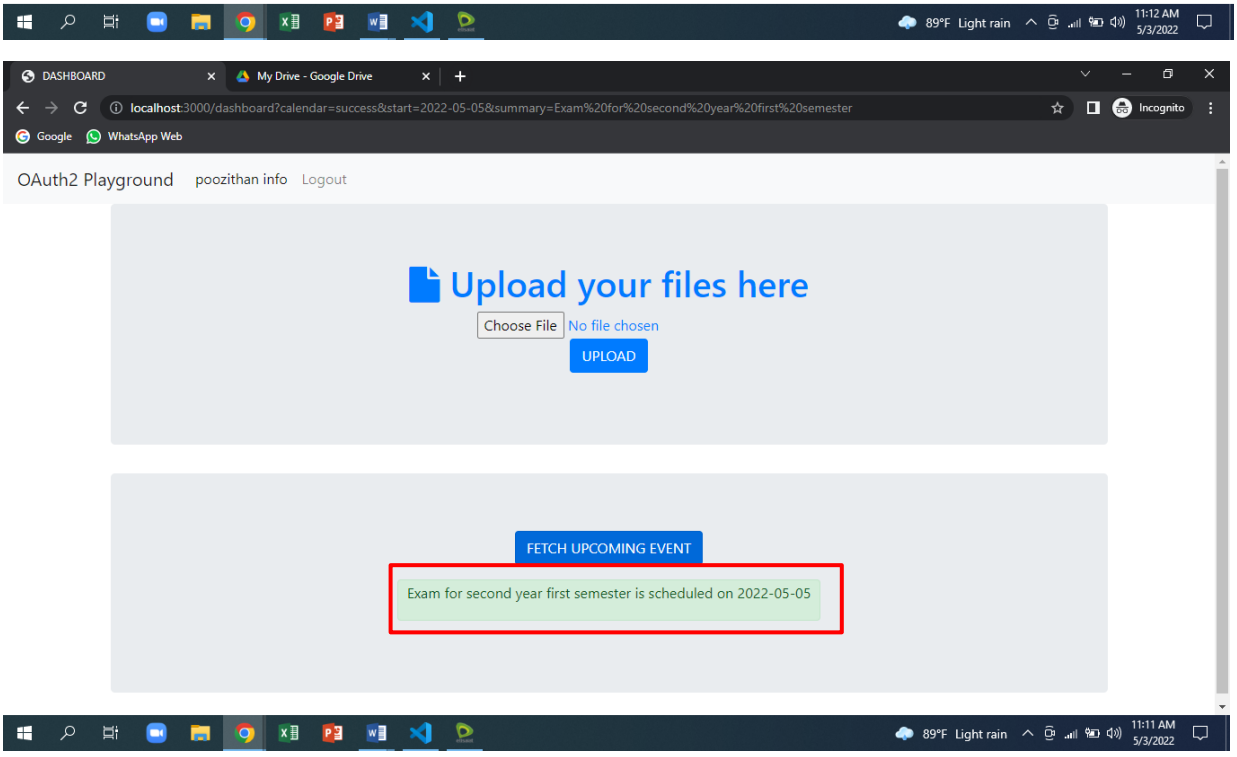
- After completed you will see your files has been successfully uploaded into google Drive.

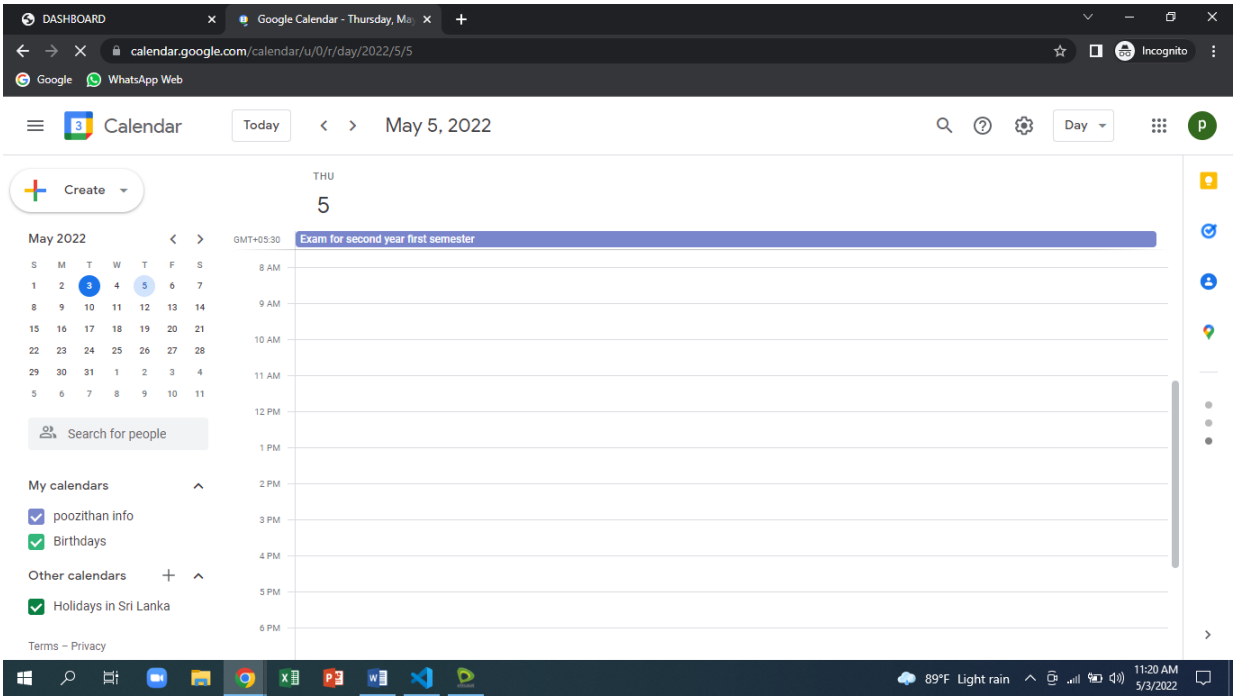


Service 3 : View the upcoming event to schedule the google calendar

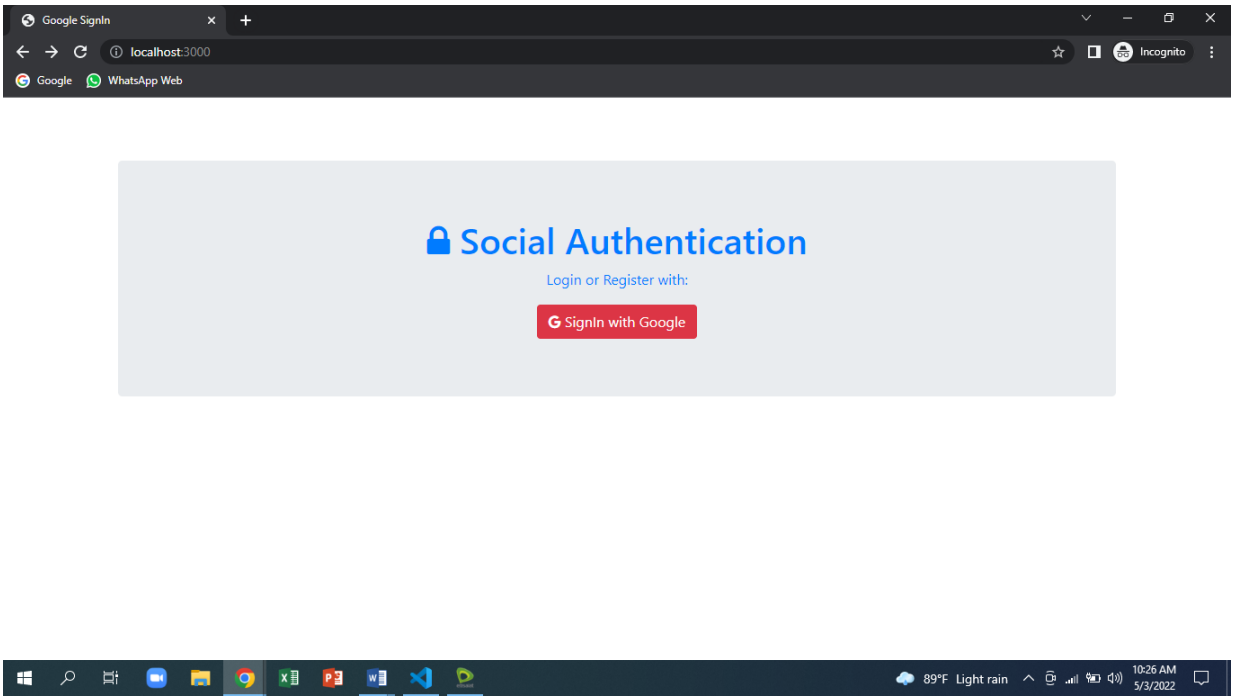
- If you want to see the upcomming event that schedule in google calendar click the “FECTH UPCOMING EVENT” button. Then day to day events message will be shown.







- Then click the logout button the page will be redirect to the below page.



Appendix

1. Index.js

```
const express = require('express')
const homeRouter = require('./routes/home')
const authRouter = require('./routes/auth')
const __ = require('./middleware/passport')
const passport = require('passport')
const session = require('express-session')
const nunjucks = require('nunjucks')
const fileUpload = require('express-fileupload')

// init app
let app = express()
const port = process.env.PORT
app.listen(process.env.PORT, '0.0.0.0', () => console.log(`server is running on
${process.env.PORT}`));


// init view
nunjucks.configure('views', {
    autoescape: true,
    express: app
});

// init static
app.use('/static', express.static('public'))

// init session
app.use(session({
    secret: process.env.SECRET_KEY,       //decode or encode session
    resave: false,
    saveUninitialized: false,
    cookie: {
        maxAge: 2 * 60 * 1000
    }
}));

// init passport
app.use(passport.initialize())
app.use(passport.session())
```

```
//current User
app.use(function (req, res, next) {
   res.locals.currentUser = req.user;
   next();
})

// file upload
app.use(fileUpload());

// init routes
app.use('', homeRouter) // home
app.use('/auth', authRouter) // auth
```

2. Passport.js

```
onst passport = require('passport')
const GoogleStrategy = require('passport-google-oauth20')

let strategy = new GoogleStrategy(
   {
      clientID: process.env.CLIENT_ID,
      clientSecret: process.env.CLIENT_SECRET,
      callbackURL: process.env.LOGIN_REDIRECT_URL,
      passReqToCallback: true

   }, (__request, accessToken, __refreshToken, profile, done) => {
      //save data in user session
      user = {
         "accesstoken": accessToken, // this token will be used to request google resources
         'googleID': profile.id,
         'name': profile.displayName,
         'email': profile._json.email
      }
      done(null, user)
   }
)

let serializerFunction = function (user, done) {
   let sessionUser = {
      _id: user.googleID,
      accessToken: user.accesstoken,
      name: user.name,
```

```
        email: user.email
    }
    done(null, sessionUser)
}


let deserializerFunction = function (user, done) {
    done(null, user)
}

passport.serializeUser(serializerFunction)  // middleware to save user info in the session
passport.deserializeUser(deserializerFunction) // middleware to retrieve user info in the
session
passport.use(strategy)
```

3. **Route**

- auth.js

```
const { Router } = require('express')
const passport = require('passport')

let router = Router()

router.get('/login', (req, res) => {
    console.log("login", req.user)
    if (req.user) {
        console.log("user is already loggedin")
        res.redirect('/dashboard') // user already authenticated hence redirect the user to
dashboard
    }
    else {
        console.log("redirecting user to google signin")
        res.render('auth.ejs', { 'title': 'Login' }) // user is not authenticated hence render the
login page
    }

}) // handle get requests on /auth/login endpoint

router.get('/login/google', passport.authenticate("google", {
    scope: ['profile', "https://www.googleapis.com/auth/drive.file",
"https://www.googleapis.com/auth/calendar", "email"]
})) // handle get request on /auth/login/google endpoint
```

```
router.get('/google/callback', passport.authenticate('google'), (__req, res) => {
   res.redirect('/dashboard') // user successfully logged in hence redirect the user to
dashboard
}) // handle get requests on /auth/google/callback endpoint

router.get('/logout', (req, res) => {
   req.logout(); // passport function to handle logout
   res.redirect('/') // redirect the user to home page
}) // handle get requests on /auth/logout endpoint

module.exports = router
```

- home.js

```
const { Router } = require('express')
const { google } = require('googleapis')

const router = Router()

// middleware to check authentication
function isLoggedIn(req, res, next) {
   if (req.isAuthenticated()) {
      return next();
   }
   res.redirect("/auth/login")
}

router.get(", (req, res) => {
   if (typeof req.user == "undefined") {
      res.redirect('/dashboard')
   } else {
      res.redirect('/auth/login')
   }
})

router.get('/dashboard', isLoggedIn, (req, res) => {

   let dashboardArgs = {
      title: 'Dashboard',
      googleid: req.user._id, // google user id
      name: req.user.name,    // google username
      email: req.user.email   // gmail id
```

```
    }

    if (req.query.file !== undefined) { // will have valid value upon file upload completion.
This is populated by
        // file upload middleware
        if (req.query.file == "upload") // upload successful
            dashboardArgs.file = "uploaded"
        else if (req.query.file == "notupload")  // upload failed
            dashboardArgs.file = "notuploaded"
    }

    if (req.query.calendar !== undefined) { // will have a valid value upon a calendar event
retrieval request
        if (req.query.calendar == "success") {          // successfully retrieved the event
            dashboardArgs.calendar = "success"
            dashboardArgs.start = req.query.start       // event starttime
            dashboardArgs.summary = req.query.summary   // event summary
        } else if (req.query.calendar == "failed") {    // failed to retrieve the event
            dashboardArgs.calendar = "failed"
        } else if (req.query.calendar == "empty") {     // no events in the calendar
            dashboardArgs.calendar = "empty"
        }
    }
    res.render('dashboard.ejs', dashboardArgs)  // render the dashboard
})

router.post('/upload', isLoggedIn, async (req, res) => { // handler for google drive file
upload
    try {

        // configure google drive connection with client token
        const oauth2Client = new google.auth.OAuth2()
        oauth2Client.setCredentials({
            'access_token': req.user.accessToken    // accessToken from the google login
        });

        const drive = google.drive({
            version: 'v3',
            auth: oauth2Client
        });
```

```
        let { name: filename, mimetype, data } = req.files.file_upload // deserialize the file
object

        const driveResponse = await drive.files.create({
            requestBody: {
                name: filename,
                mimeType: mimetype
            },
            media: {
                mimeType: mimetype,
                body: Buffer.from(data).toString()
            }
        });

        if (driveResponse.status == 200)
            res.redirect('/dashboard?file=upload') // successfully uploading the file
        else
            res.redirect('/dashboard?file=notupload') // file upload failed
    } catch (error) {
        console.log(error)
        res.redirect('/dashboard?file=notupload') // file upload failed
    }
})

router.get('/calendar', isLoggedIn, async (req, res) => {
    try {
        // configure google calendar connection with client token
        const oauth2Client = new google.auth.OAuth2()
        oauth2Client.setCredentials({
            'access_token': req.user.accessToken    // accessToken from the google login
        });

        const calendar = google.calendar({
            version: 'v3',
            auth: oauth2Client
        });

        const calendar_list_response = await calendar.calendarList.list(maxResults = 1) //
select the first calendar
        console.log(calendar_list_response.data.items[0].id)

        const eventList = await calendar.events.list({  // retrieve the event list
```

```
            calendarId: calendar_list_response.data.items[0].id,
            timeMin: (new Date()).toISOString(),
            maxResults: 1,
            singleEvents: true,
            orderBy: 'startTime',
        })
        console.log(eventList.data.items)
        if (eventList.data.items.length > 0) {
            nextEventObj = eventList.data.items[0] // select the upcoming event
            console.log(nextEventObj)
            upcomingEvent = {
                start: nextEventObj.start.dateTime || nextEventObj.start.date,
                summary: nextEventObj.summary
            }
            console.log("upcoming event", upcomingEvent)

res.redirect(`/dashboard?calendar=success&start=${upcomingEvent.start}&summary=${
upcomingEvent.summary}`) // succefully retrieved hence redirect

        } else {
            res.redirect('/dashboard?calendar=empty') // no calendar events
        }
    } catch (error) {
        console.log(error)
        res.redirect('/dashboard?calendar=failed') // file upload failed
    }

})


module.exports = router
```

4. **GUI Design**
   - **auth.ejs**

```
<!-- views/pages/auth.ejs -->
<!doctype html>
<html>

<head>
    <title>{{title}}</title>
    <link rel="stylesheet"
```

```
href="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/css/bootstrap.min.css" />
   <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/font-
awesome/4.7.0/css/font-awesome.min.css">
   <style>
      body {
         padding-top: 70px;
      }
   </style>
</head>

<body>
   <div class="container">
      <div class="jumbotron text-center text-primary">
         <h1><span class="fa fa-lock"></span> Social Authentication</h1>
         <p>Login or Register with:</p>
         <a href="/auth/login/google" class="btn btn-danger"><span class="fa fa-
google"></span> SignIn with
            Google</a>
      </div>
   </div>
</body>

</html>
```

- dashboard.ejs

```
<!DOCTYPE html>
<html lang="en">

<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <meta http-equiv="X-UA-Compatible" content="ie=edge">
   <title>{{title}}</title>
   <link rel="stylesheet"
href="https://stackpath.bootstrapcdn.com/bootstrap/4.4.1/css/bootstrap.min.css" />
   <link rel="stylesheet" href="https://stackpath.bootstrapcdn.com/font-
awesome/4.7.0/css/font-awesome.min.css">
</head>

<body>
   <nav class="navbar navbar-expand-lg navbar-light bg-light">
      <a class="navbar-brand" href="#">OAuth2 Playground</a>
      <button class="navbar-toggler" type="button" data-toggle="collapse" data-
```

```
target="#navbarNav"
        aria-controls="navbarNav" aria-expanded="false" aria-label="Toggle
navigation">
        <span class="navbar-toggler-icon"></span>
      </button>
      <div class="collapse navbar-collapse" id="navbarNav">
        <ul class="navbar-nav">
          <li class="nav-item active">
            <a class="nav-link" href="#">{{name}} <span class="sr-
only">(current)</span></a>
          </li>
          <li class="nav-item">
            <a class="nav-link" href="/auth/logout">Logout</a>
          </li>
        </ul>
      </div>
    </nav>

    <div class="container">
      <div class="jumbotron text-center text-primary">
        <h1><span class="fa fa-file"></span> Upload your files here</h1>
        <div>
          {% if (file == "uploaded") %}
          <div class="alert alert-success" style="padding: 2px 10px; display: inline-
block; width: fit-content">
            <p>File successfully uploaded</p>
          </div>
          {% elif (file == "notuploaded") %}
          <div class="alert alert-danger" style="padding: 2px 10px; display: inline-block;
width: fit-content">
            <p>File failed to upload please try again</p>
          </div>
          {% endif %}
        </div>
        <form action="/upload" method="post" enctype="multipart/form-data">
          <div class="form-group">
            <input style="display: inline-block;width: fit-content" type="file"
class="form-control-file"
              required name="file_upload" id="file_upload">
            <button style="display: block; margin: 0 auto" class="btn btn-primary mb-2"
              type="submit">UPLOAD</button>
          </div>
```

```
            </form>
        </div>
        <div class="jumbotron text-center text-primary">
            <form action="/calendar" method="get" enctype="multipart/form-data">
                <div class="form-group">
                    <button style="display: block; margin: 0 auto" class="btn btn-primary mb-2"
type="submit">FETCH
                        UPCOMING EVENT</button>
                </div>
            </form>
            <div>
                {% if (calendar == "success") %}
                <div class="alert alert-success" style="padding: 2px 10px; display: inline-
block; width: fit-content">
                    <p> {{summary}} is scheduled on {{start}} </p>

                </div>
                {% elif (calendar == "failed") %}
                <div class="alert alert-danger" style="padding: 2px 10px; display: inline-block;
width: fit-content">
                    <p>Failed to fetch upcoming event</p>
                </div>
                {% elif (calendar == "empty") %}
                <div class="alert alert-success" style="padding: 2px 10px; display: inline-
block; width: fit-content">
                    <p>No events found</p>
                </div>
                {% endif %}
            </div>
        </div>
    </div>
</body>

</html>
```