Capstone Project:

Youtube Clone using MERN Stack

Submitted By :
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Github : https://github.com/chaitali9497/youtube-clone

Video Demo :
https://www.loom.com/share/10a99b9ca3094995a65c7d84fe2db01d

https://www.loom.com/share/e775e00266124035bc9ddef53ac83980

PROJECT OVERVIEW :

The **YouTube Clone Application** is a full-stack web application developed using the **MERN stack (MongoDB, Express.js, React.js, and Node.js)**. The project aims to replicate the core features and user experience of YouTube, allowing users to browse, watch, upload, and interact with video content in a scalable and responsive environment.

This application demonstrates the implementation of real-world full-stack concepts such as user authentication, RESTful APIs, database design, state management, and responsive UI development. It is designed to provide hands-on experience in building modern web applications with secure authentication and dynamic data handling.

Objective

The primary objective of this project is to build a functional video-sharing platform where users can:

- Register and authenticate securely
- Browse and search for videos
- Watch videos and interact through likes, dislikes, and comments
- Create and manage their own channels
- Upload, edit, and delete videos

Key Features

Frontend (React)

- **Home Page**
    - YouTube-style header with search bar
    - Toggleable sidebar navigation
    - Category-based filter buttons
    - Grid layout displaying video thumbnails with title, channel name, views, and upload details
- **User Authentication**
    - User registration and login using email, username, and password
    - JWT-based authentication
    - Conditional UI rendering based on login status
- **Video Player Page**
    - Embedded video player
    - Video title and description
    - Comment section with full CRUD operations (add, edit, delete comments)
- **Channel Page**
    - Channel creation available only for authenticated users
    - Display all videos uploaded by the channel
    - Video management features (edit and delete videos)

- **Responsive Design**
    - Fully responsive layout for desktop, tablet, and mobile devices

Backend (Node.js & Express)

- **RESTful APIs**
    - User authentication (signup, login, JWT validation)
    - Channel management APIs
    - Video management APIs (CRUD operations)
    - Comment management APIs
- **Authentication & Security**
    - JSON Web Tokens (JWT) for secure authentication
    - Protected routes for authorized users

Database (MongoDB)

- Stores structured data for:
    - Users
    - Videos
    - Channels
    - Comments

- Handles video metadata such as video URLs, thumbnails, views, likes, and timestamps

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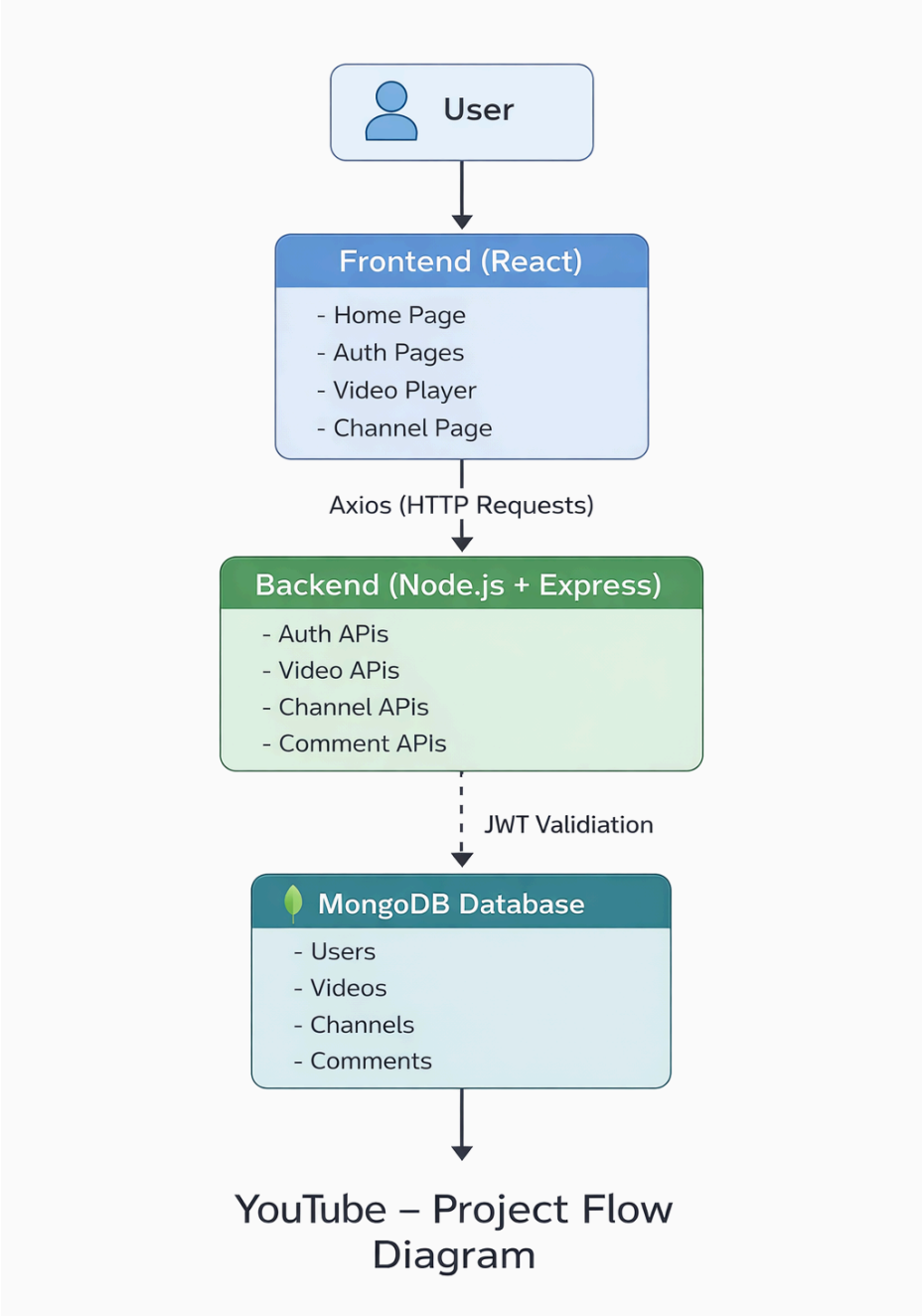
Technologies Used

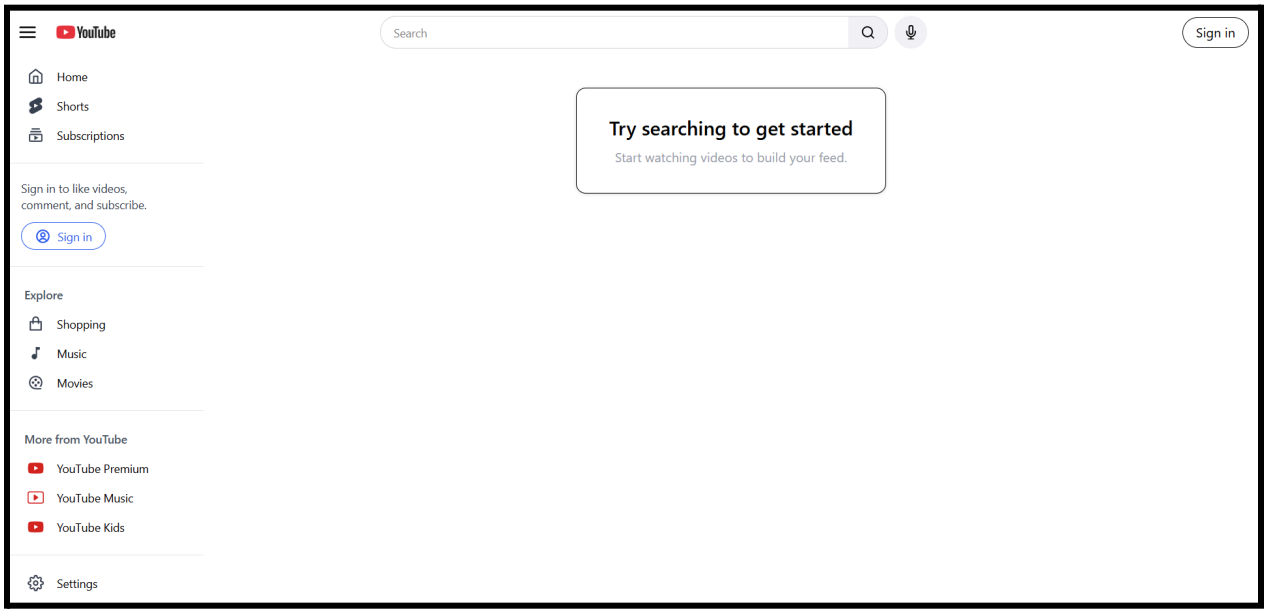
- **Frontend:** React, React Router, Axios
- **Backend:** Node.js, Express.js
- **Database:** MongoDB (MongoDB Atlas / Local)
- **Authentication:** JWT (JSON Web Tokens)
- **Version Control:** Git & GitHub
- **Development Tools:** Vite, Thunderclient

PROJECT FLOW :

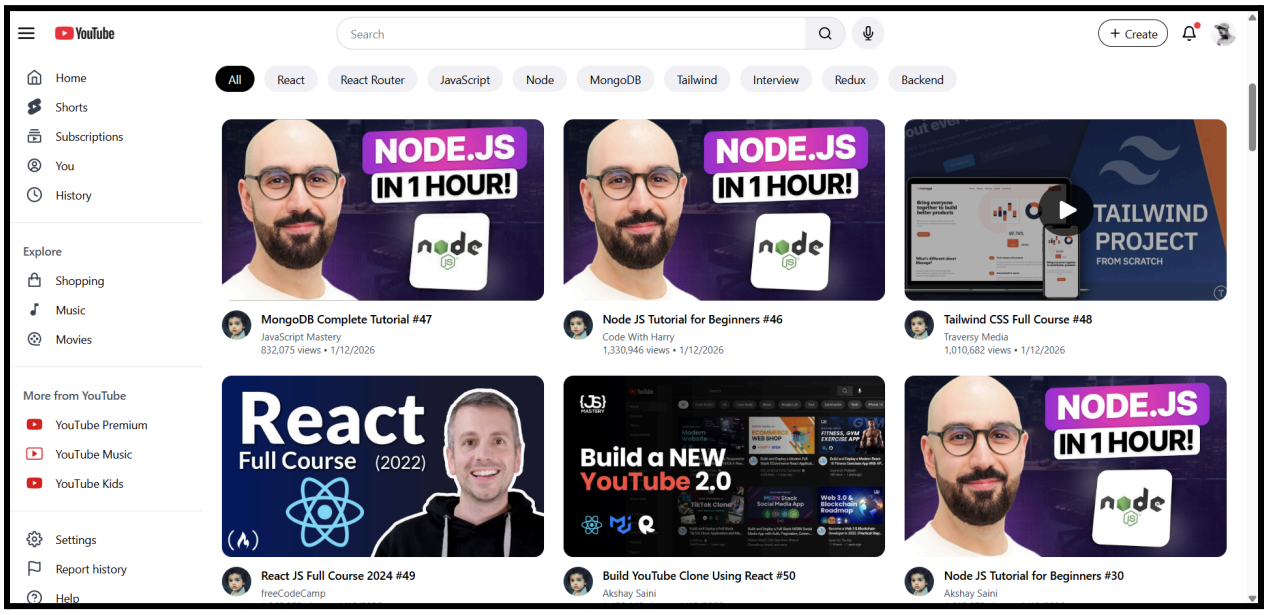


FrontEnd UI sneak peek:

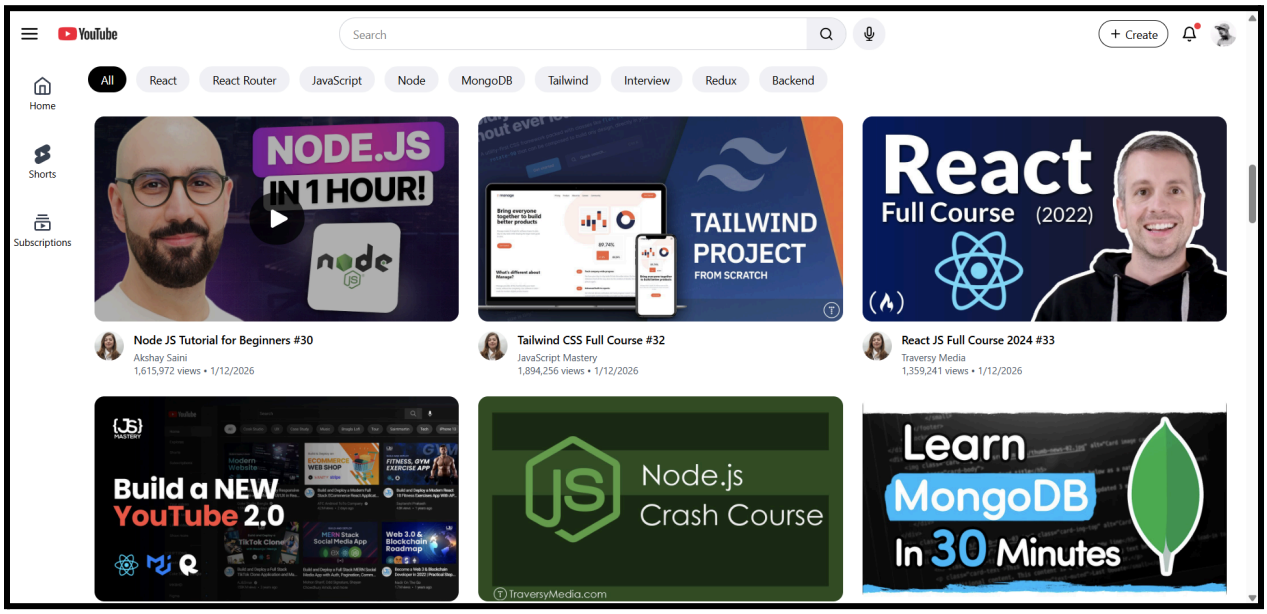
Unauthenticated user:



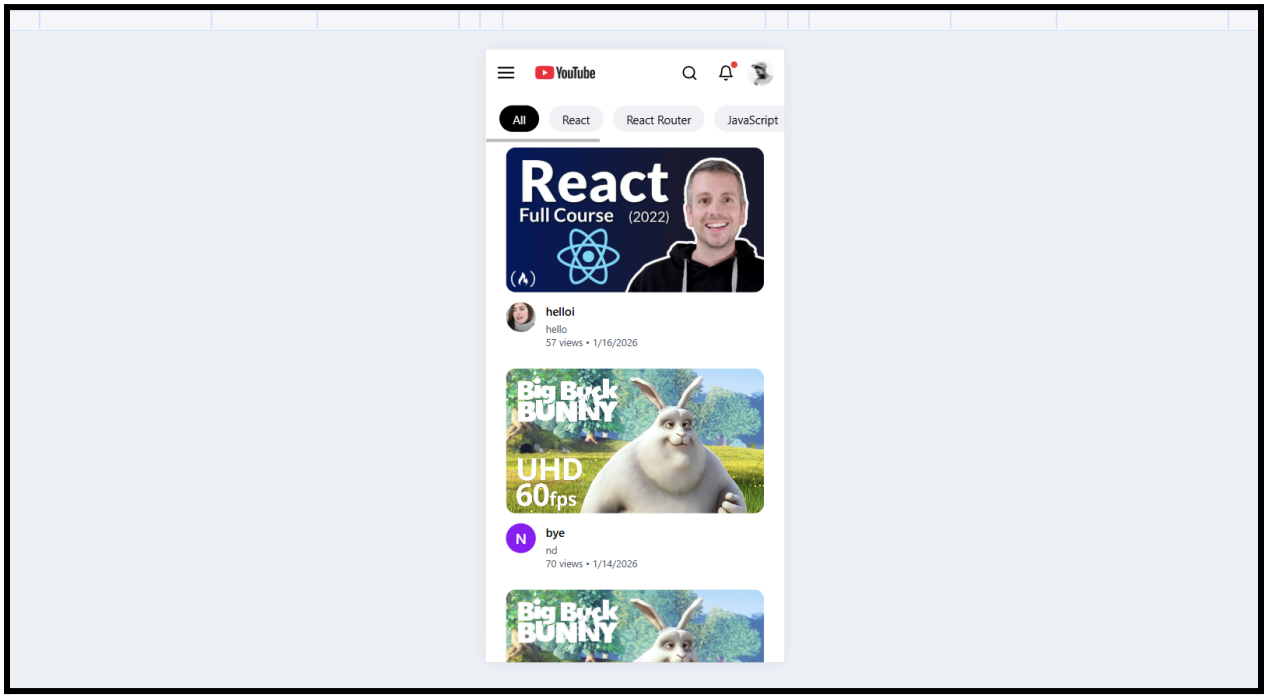
Authenticated user:

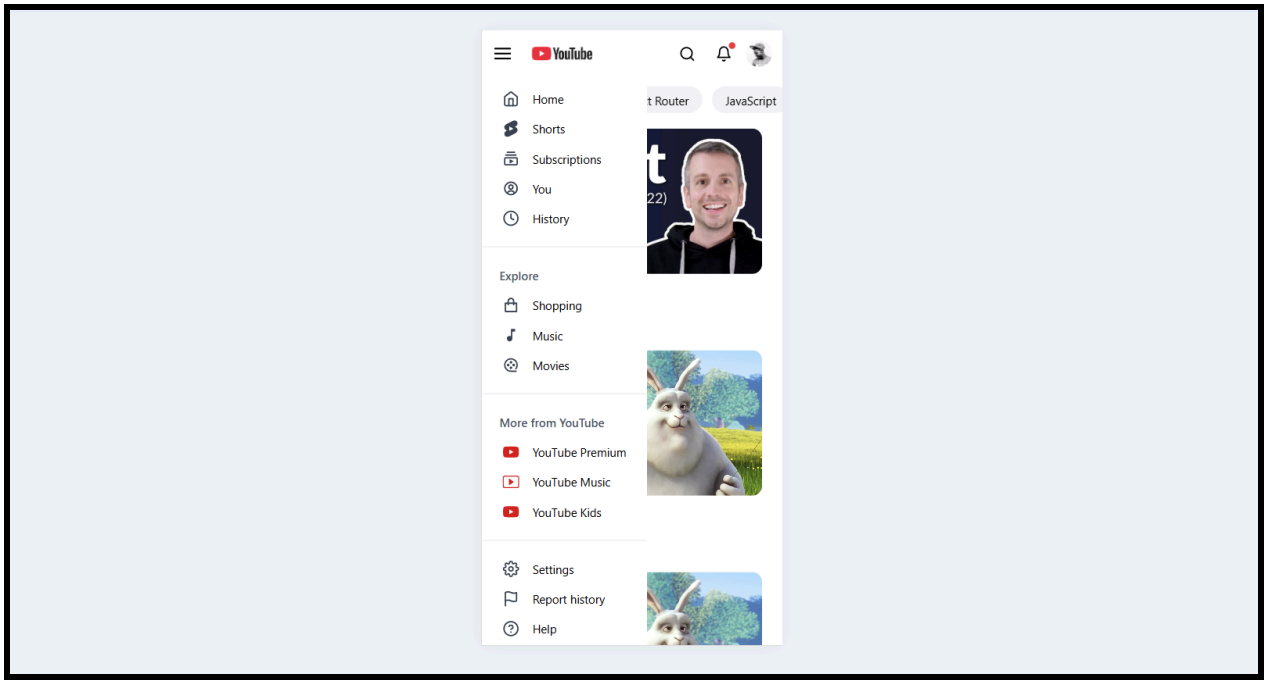


Toggled Menu:

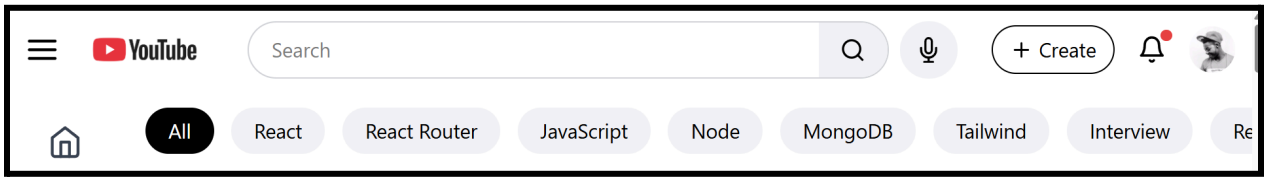


Responsive UI:

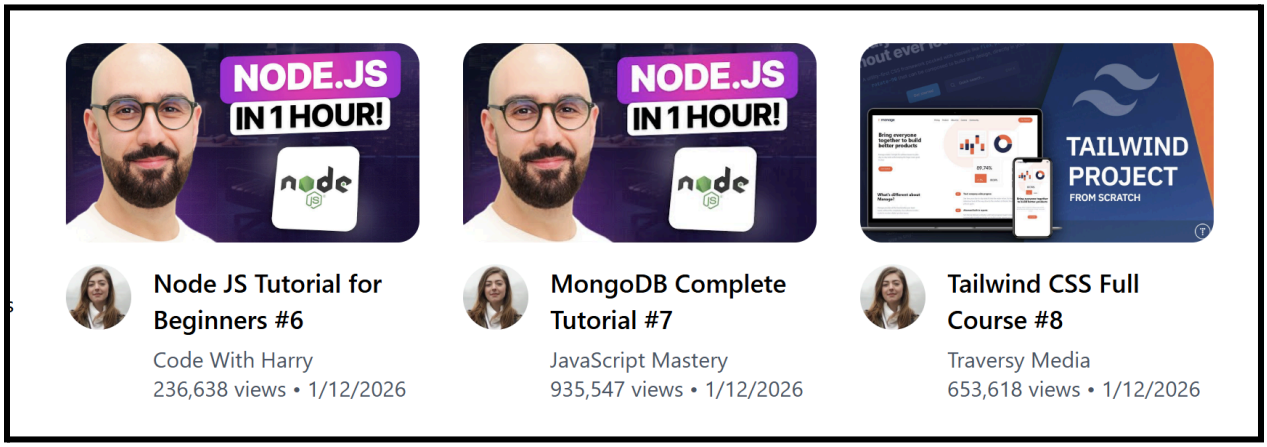




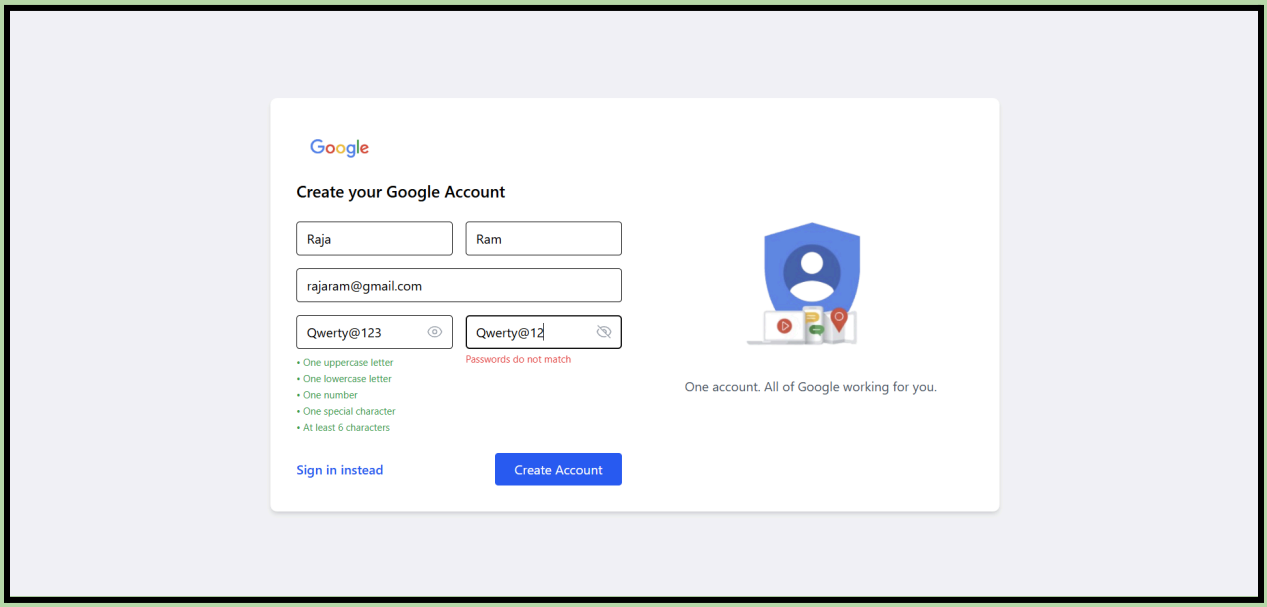
Header/ Hamburger/ Filter Buttons:



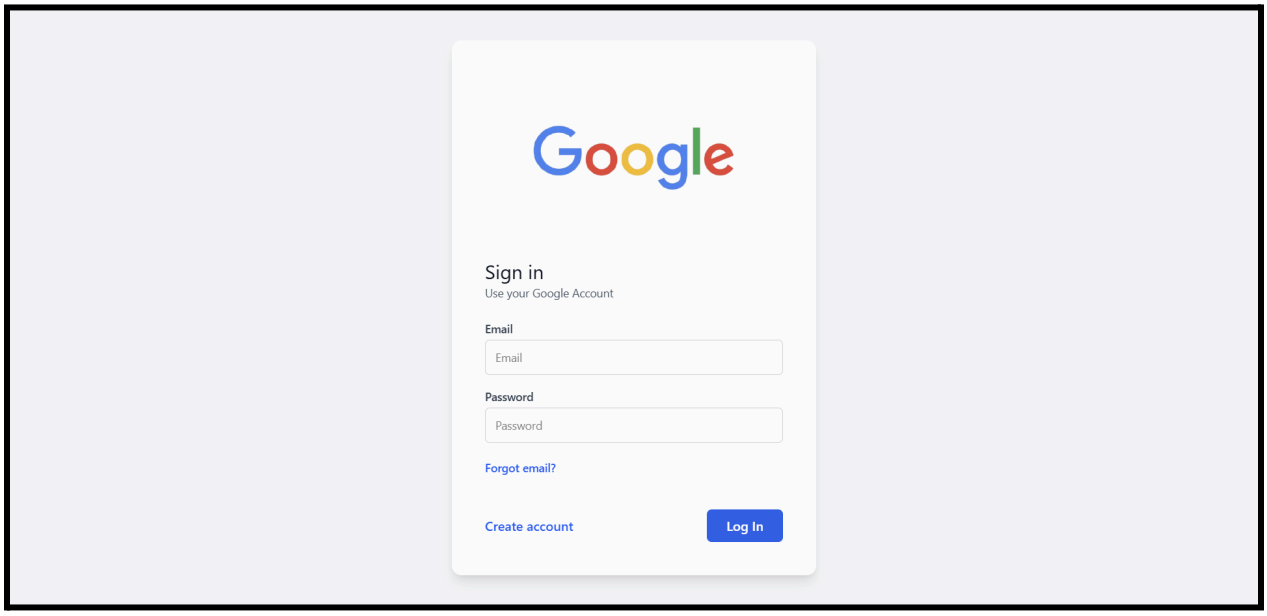
Thumbnail / Image/ Title/ Channel/ Views/ Date:

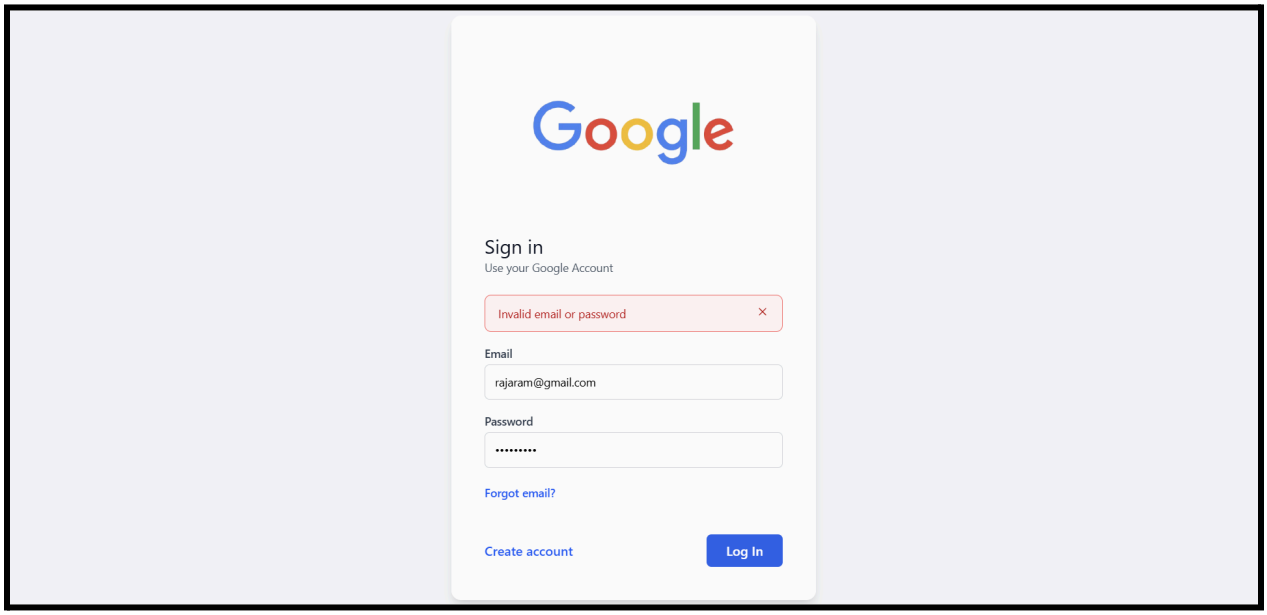


Create account page with validation:

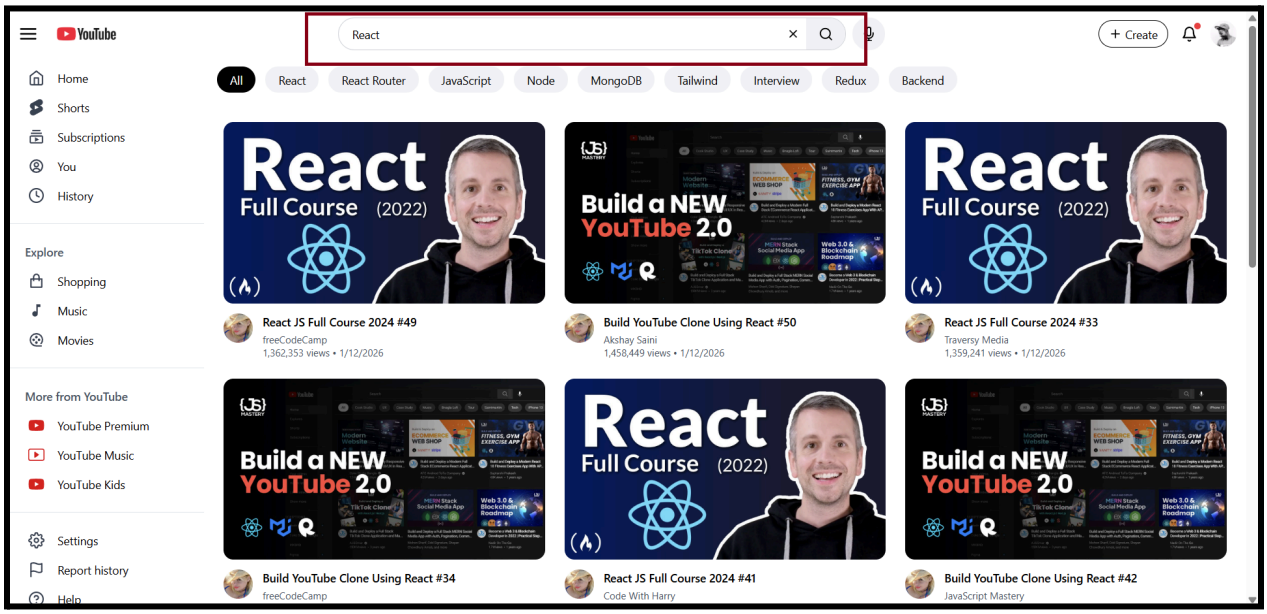


Sign In Form:

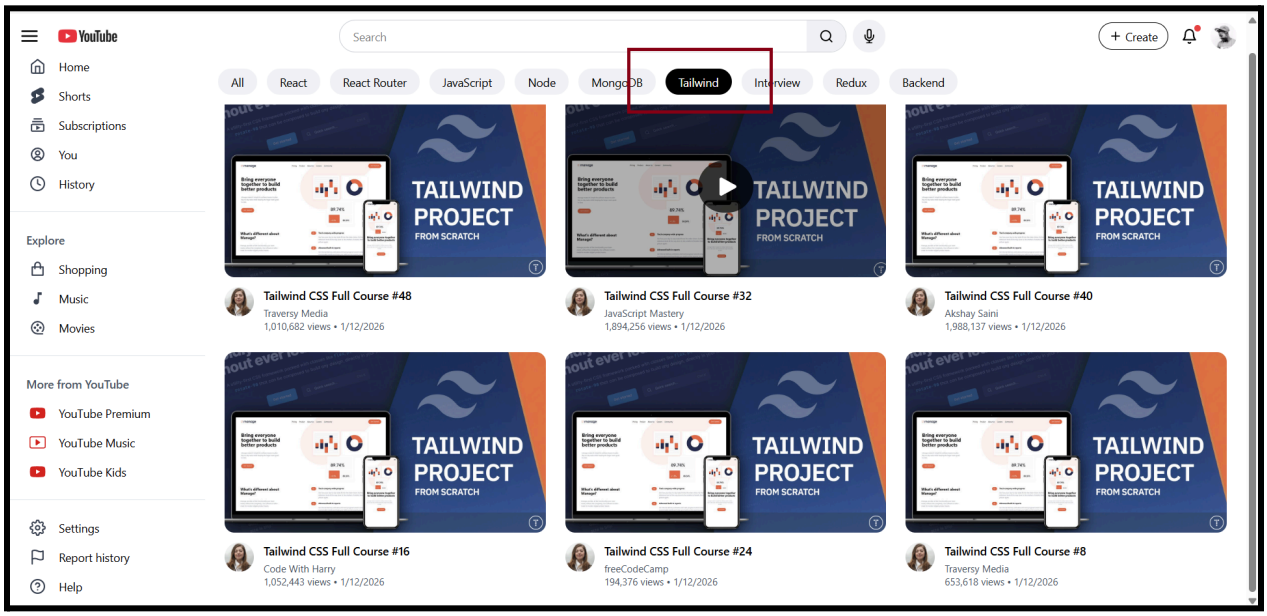

Google
Sign in
Use your Google Account
Email
Email
Password
Password
Forgot email?
Create account
Log In


Google
Sign in
Use your Google Account
Invalid email or password
Email
rajaram@gmail.com
Password
Forgot email?
Create account
Log In

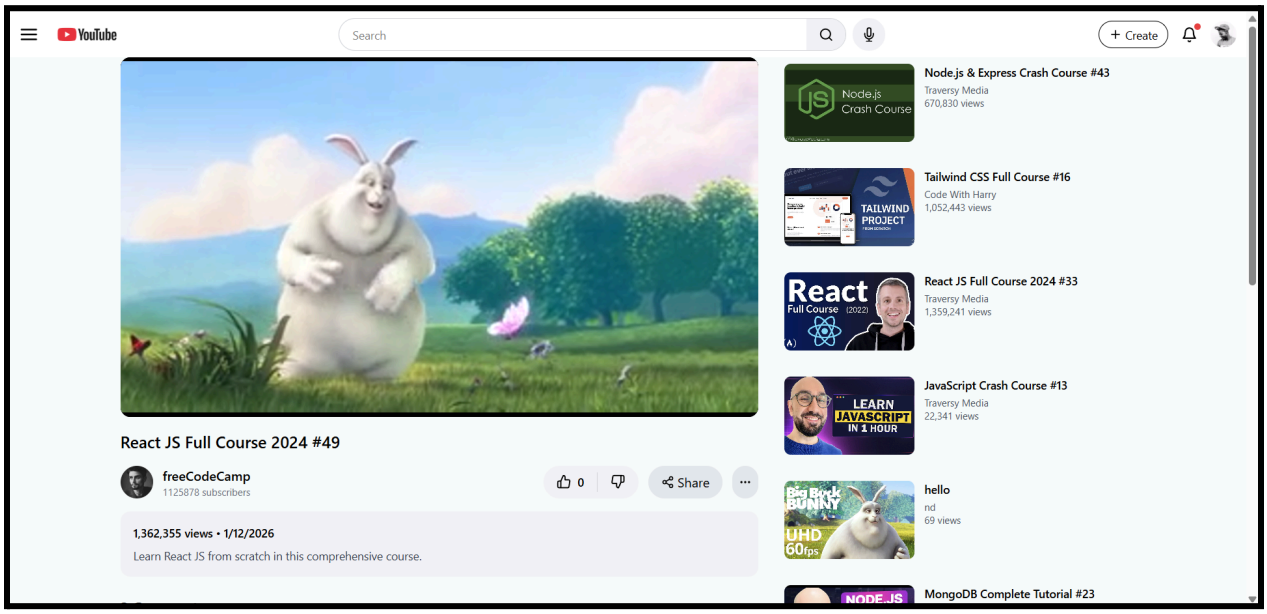
Search functionality:

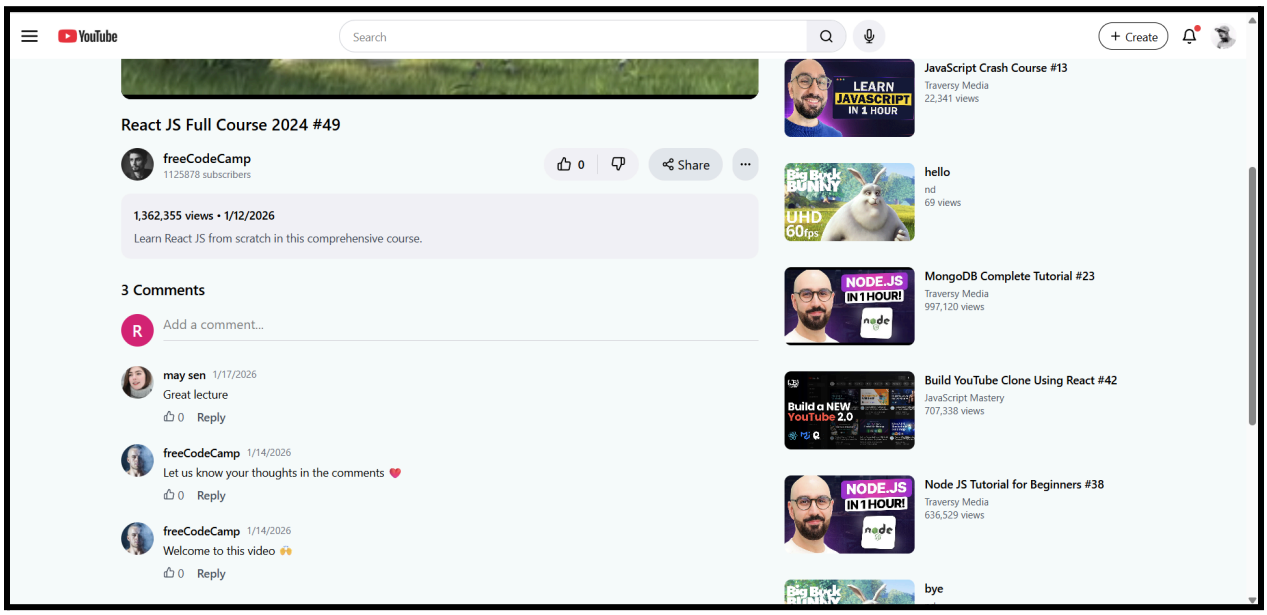


Filter Functionality:

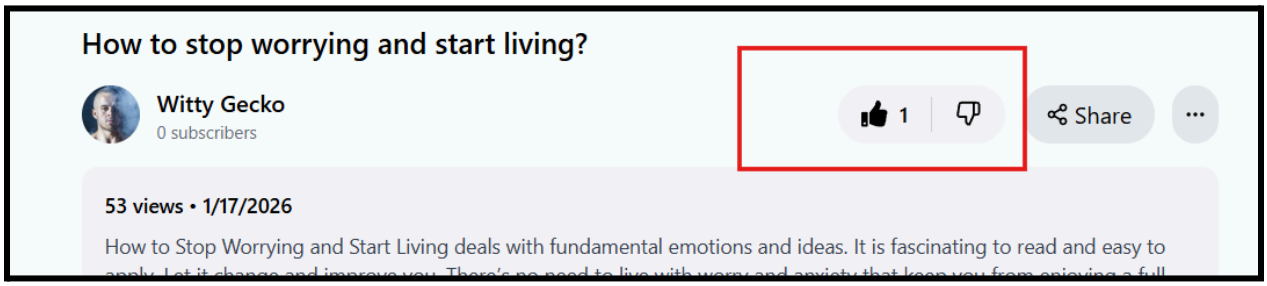


Video Player/ Title / Description / Channel name / Like / Comments / Side Section

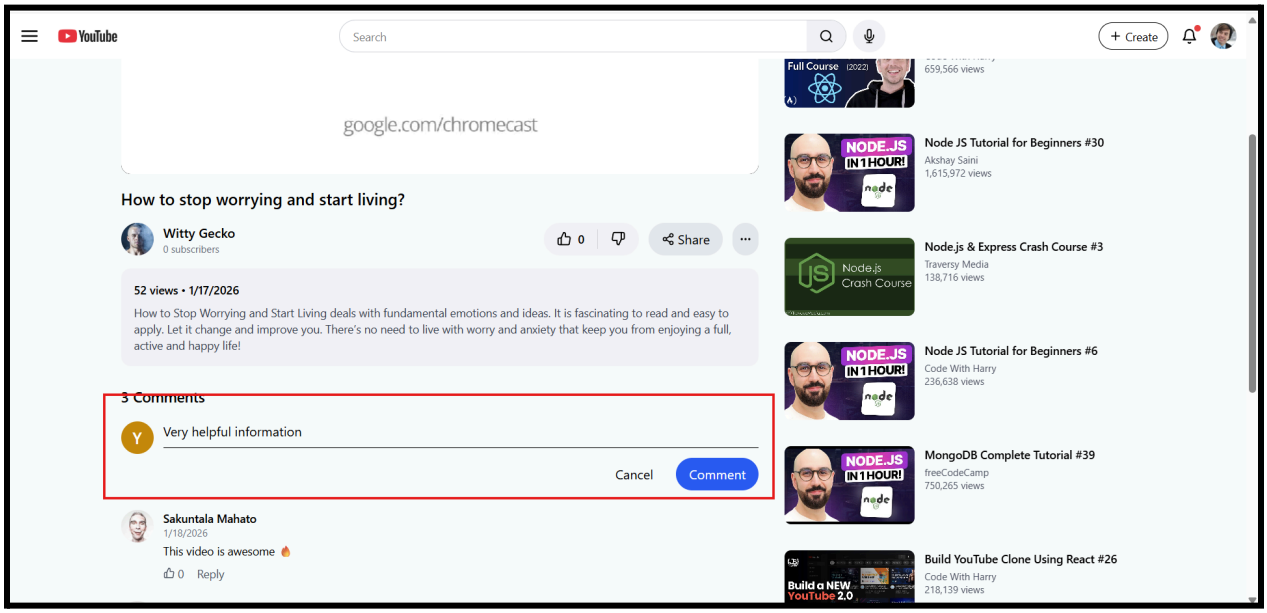




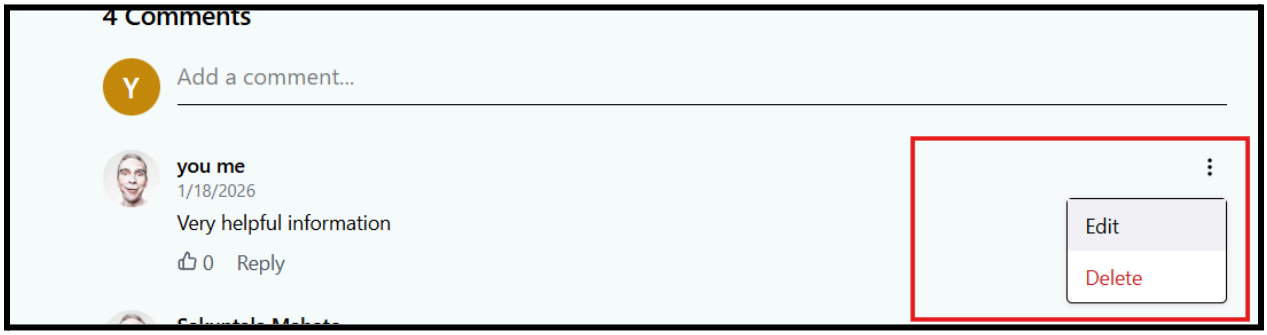
Add/Remove Like:

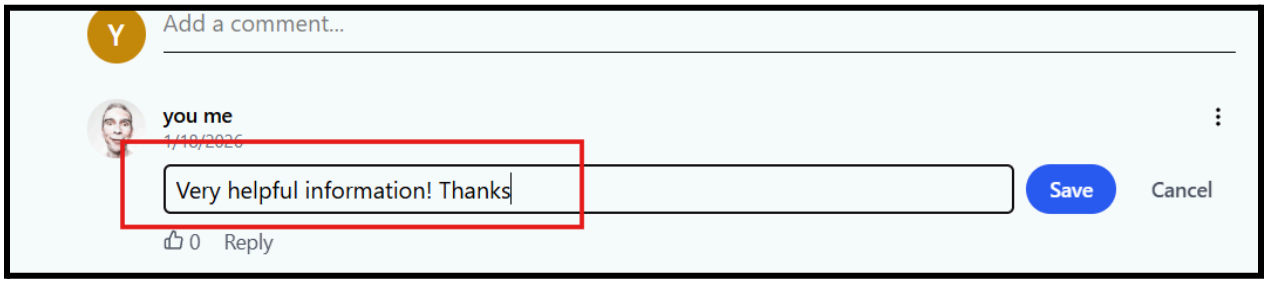


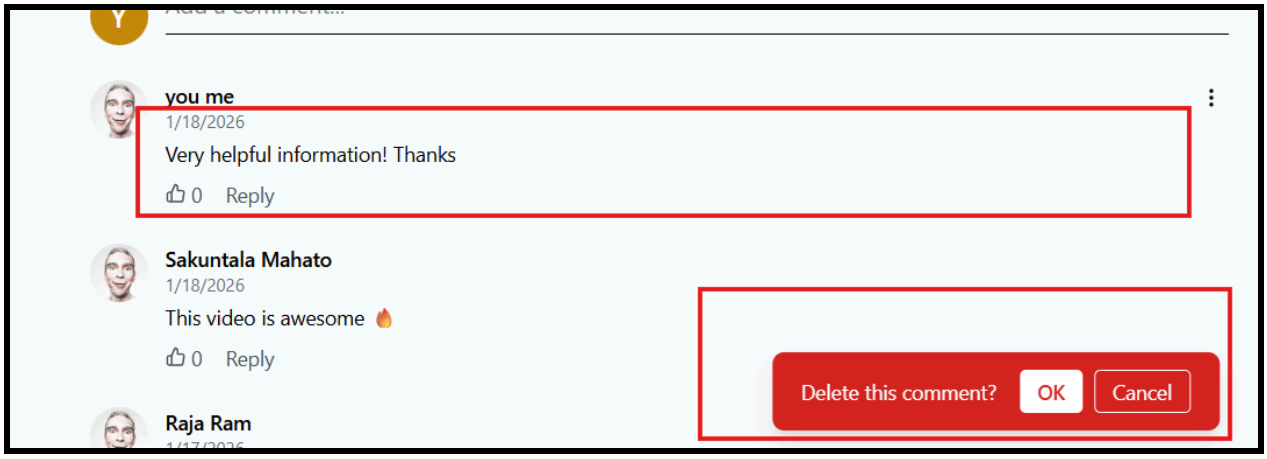
Add comment:



Edit/Delete comment:

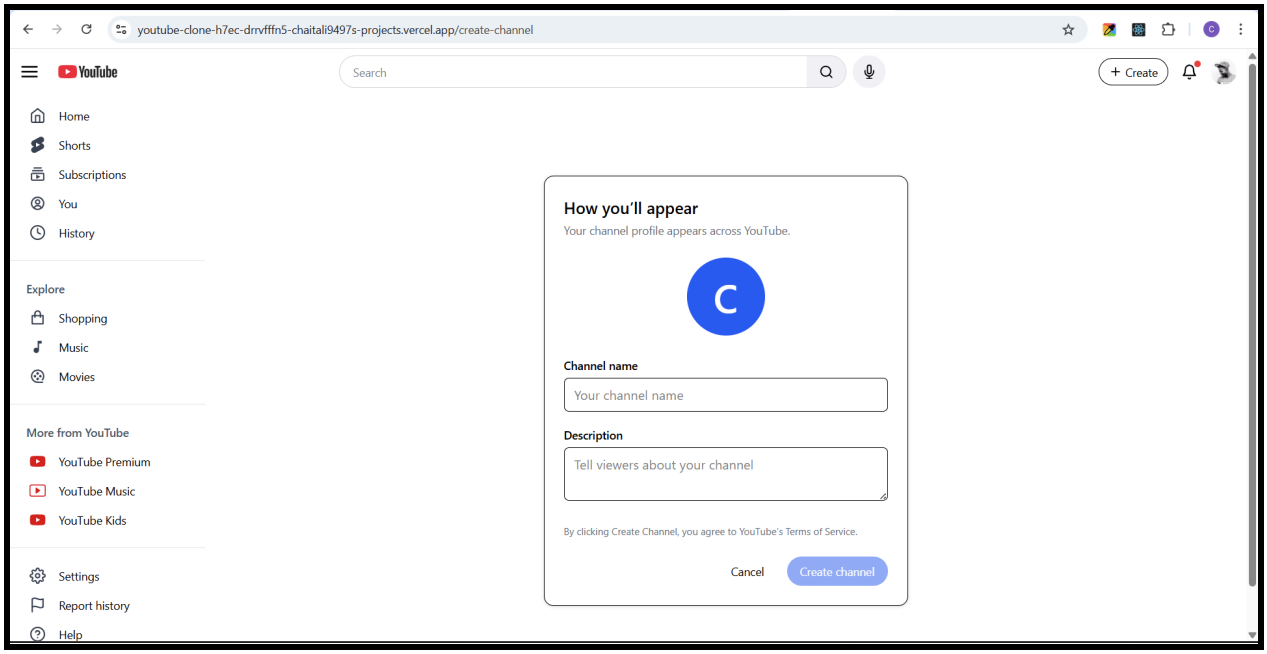


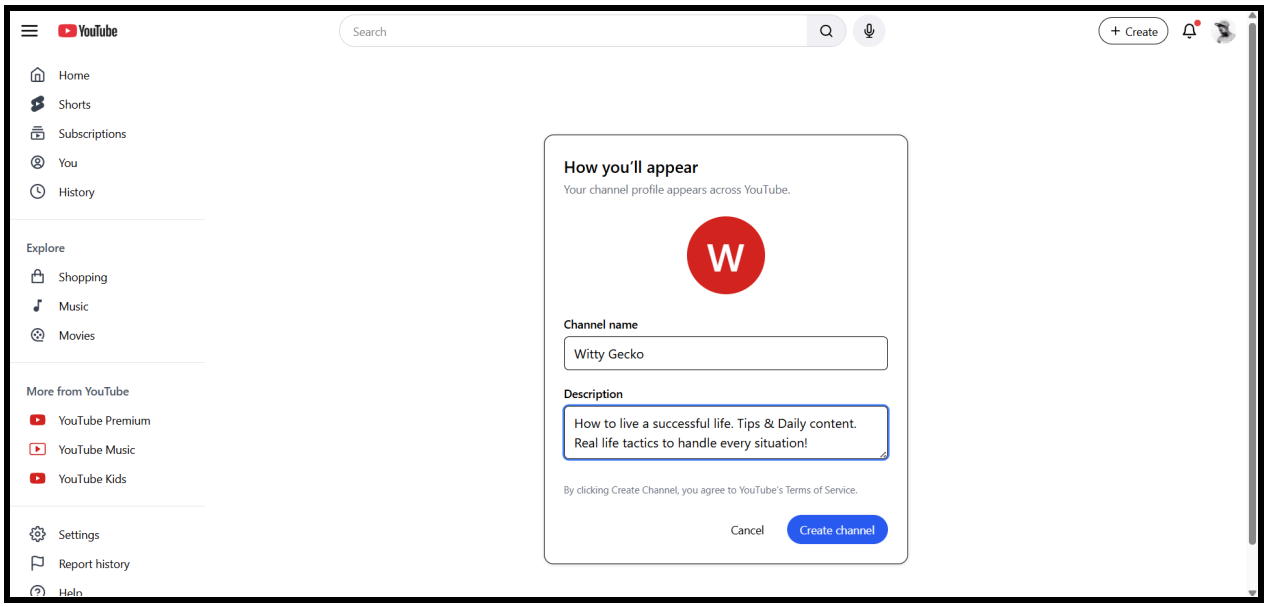




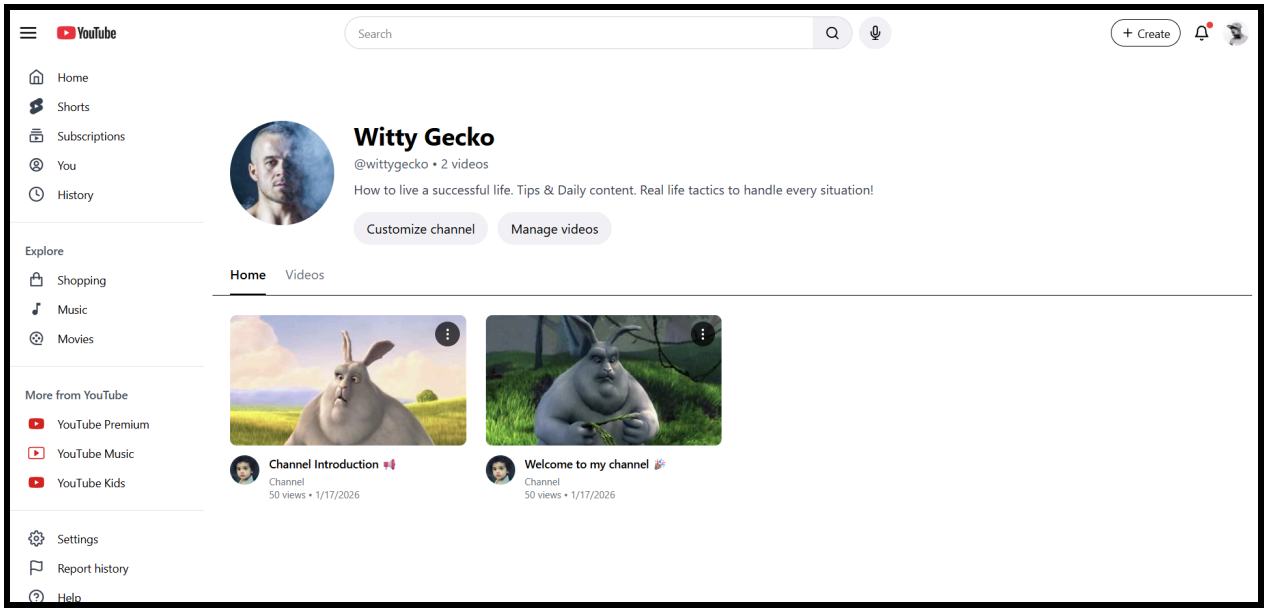
Channel Page:

Create Channel by giving Channel Name & Description

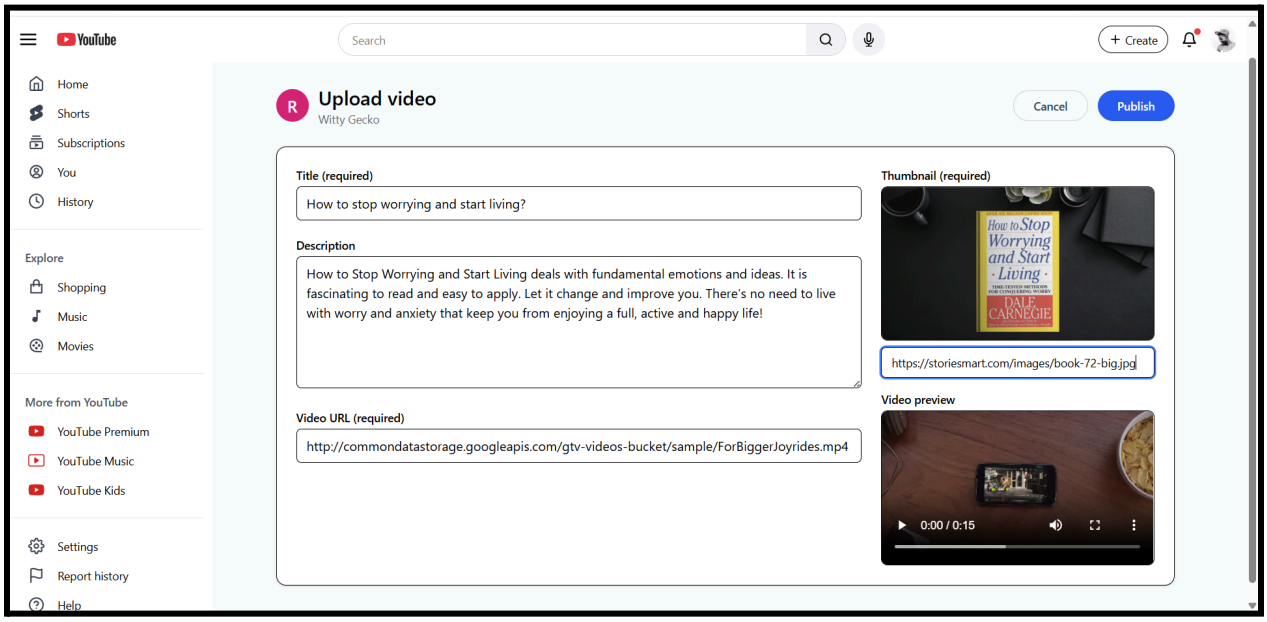




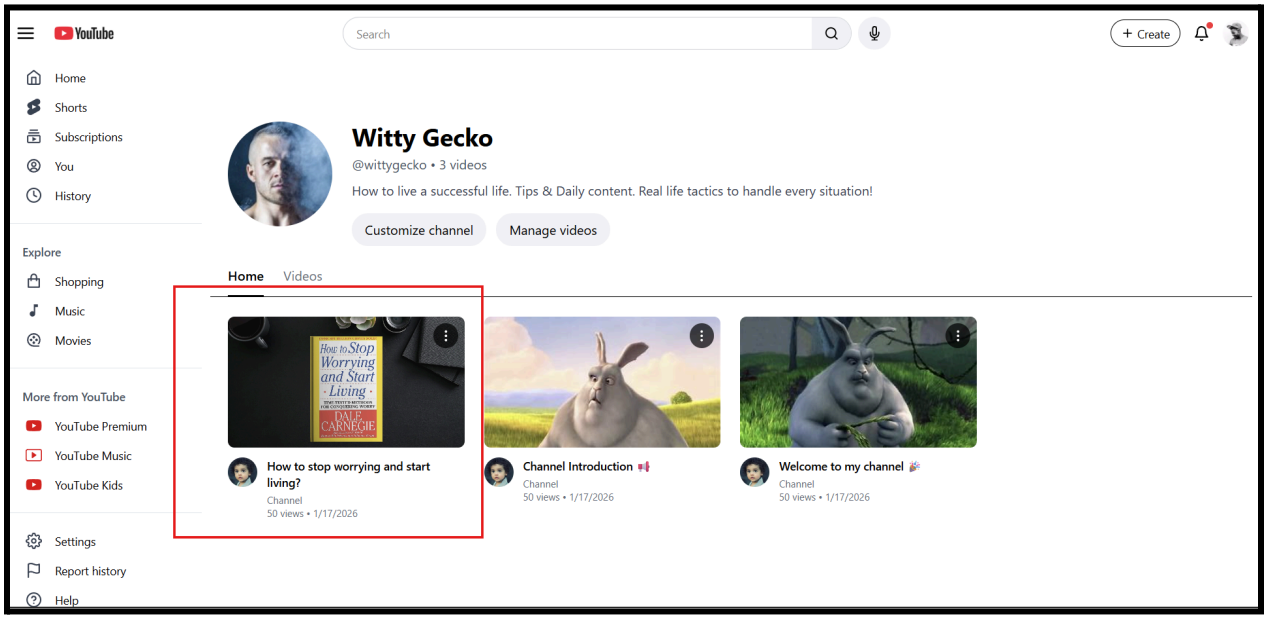
Created Channel



Upload video and image (Provide hosted image url & video url)



We can see the uploaded image in the Channel page



Test Results :

1) POST register users

Request:

Method: POST

URL: http://localhost:5000/api/auth/register

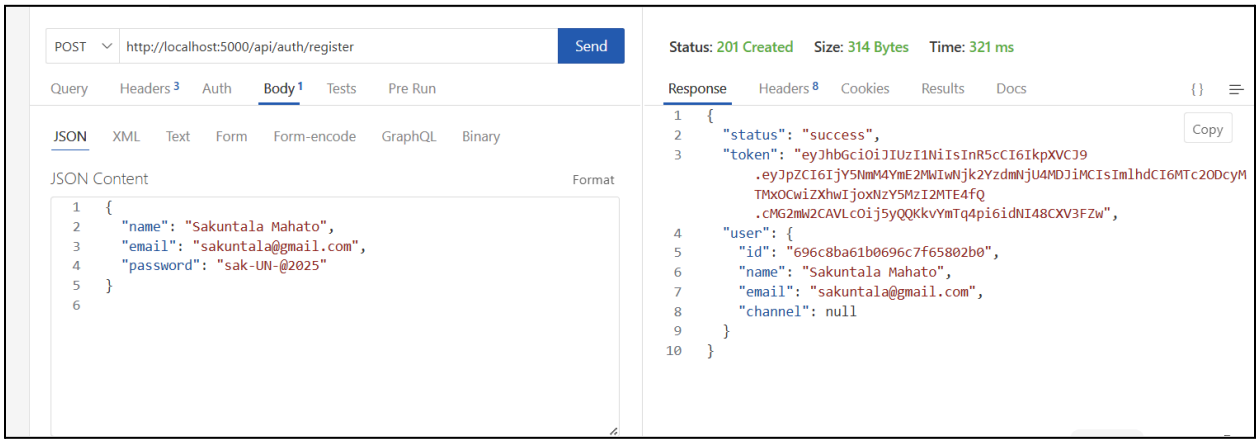
Body:


```
{
  "name": "Sakuntala Mahato",
  "email": "sakuntala@gmail.com",
  "password": "sak-UN-@2025"
}
```

Headers:
Content-Type: application/json

Response:

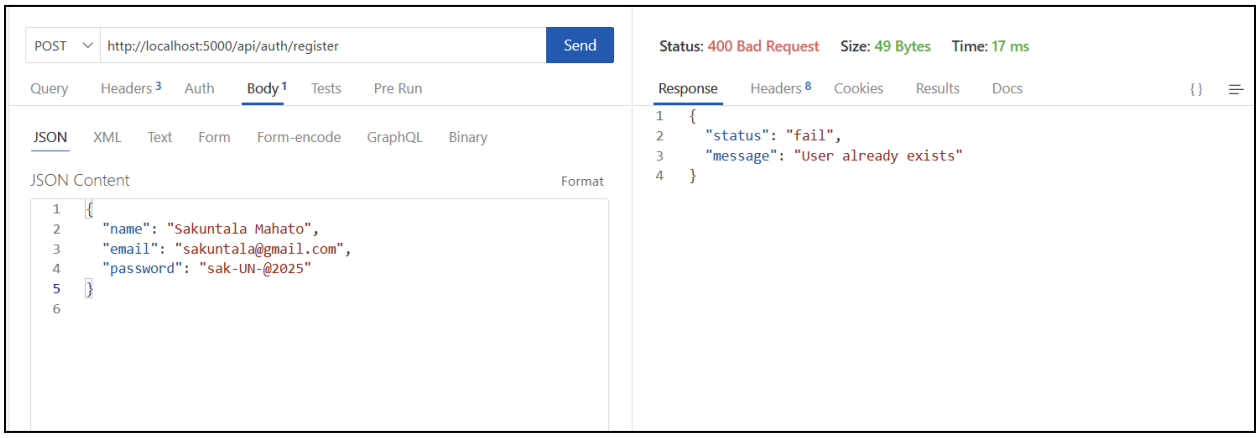

```
{
  "status": "success",
  "token":
"eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjY5NmM4YmE2
MWIwNjk2YzdmNjU4MDJiMCIsImlhdCI6MTc2ODcyMTMxOCwiZXhwI
joxNzY5MzI2MTE4fQ.cMG2mW2CAVLcOij5yQQKkvYmTq4pi6idNI48
CXV3FZw",
  "user": {
    "id": "696c8ba61b0696c7f65802b0",
    "name": "Sakuntala Mahato",
    "email": "sakuntala@gmail.com",
    "channel": null
  }
}
```

Data is inserted in MongoDB Database


```
_id: ObjectId('696c8ba61b0696c7f65802b0')
name : "Sakuntala Mahato"
email : "sakuntala@gmail.com"
password : "$2b$12$NeJDxmK8weGJf9r2XPluk.FUaZhQRgjaWhzXPoG2RbGz4IN1aqdBq"
avatar : "https://i.pravatar.cc/150?img=6"
subscribers : 0
createdAt : 2026-01-18T07:28:38.688+00:00
updatedAt : 2026-01-18T07:28:38.688+00:00
__v : 0
```


Validation if user tries to signup using same email



2) POST login user

Request:

Method: POST

URL: http://localhost:5000/api/auth/login

Body:

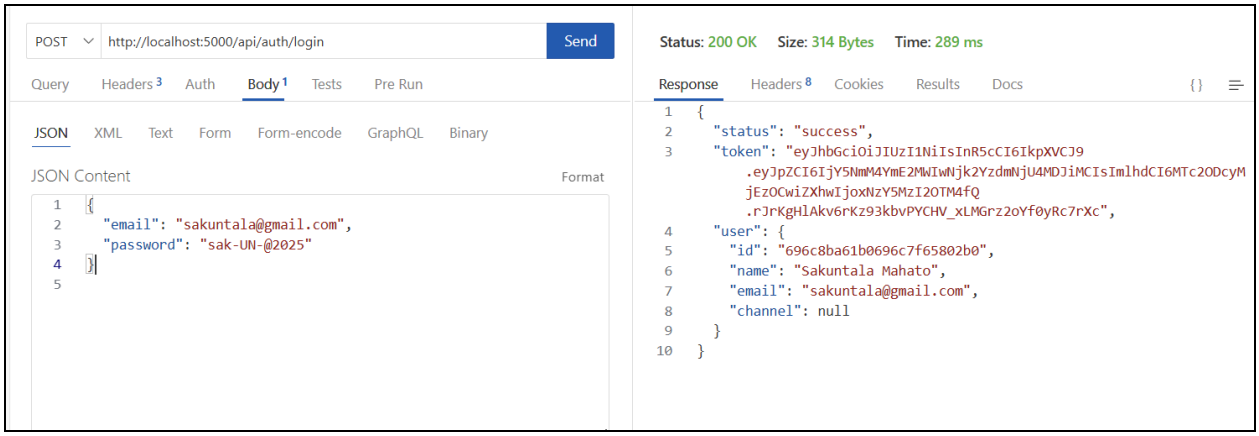

```
{
  "email": "sakuntala@gmail.com",
  "password": "sak-UN-@2025"
}
```


Headers:

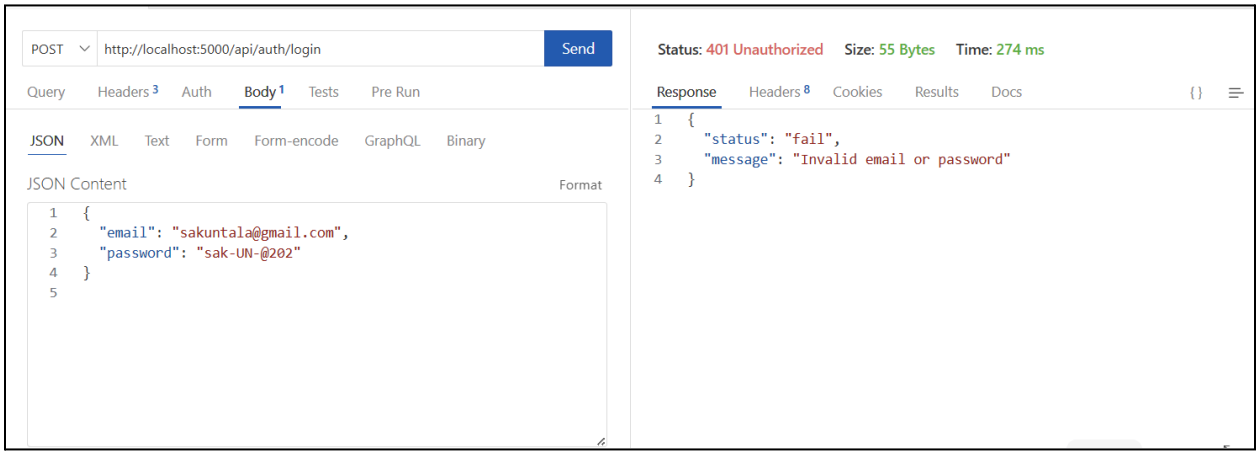
Content-Type: application/json

Response:


```
{
  "status": "success",
  "token":
"eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjY5NmM4YmE2
MWIwNjk2YzdmNjU4MDJiMCIsImlhdCI6MTc2ODcyMjEzOCwiZXhwIj
oxNzY5MzI2OTM4fQ.rJrKgHlAkv6rKz93kbvPYCHV_xLMGrz2oYf0yR
c7rXc",
  "user": {
    "id": "696c8ba61b0696c7f65802b0",
    "name": "Sakuntala Mahato",
    "email": "sakuntala@gmail.com",
    "channel": null
  }
}
```



Validation for wrong email/password



3) CREATE channel

Request:
Method: POST
URL: http://localhost:5000/api/channels
Headers:
Content-Type: application/json
Authorization: Bearer
eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjY5NmM4YmE2MWIwNjk2YzdmNjU4MDJiMCIsImlhdCI6MTc2ODcyMjEzOCwiZXhwIjoxNzY5MzI2OTM4fQ.rJrKgHlAkv6rKz93kbvPYCHV_xLMGrz2oYf0yRc7rXc

Body :

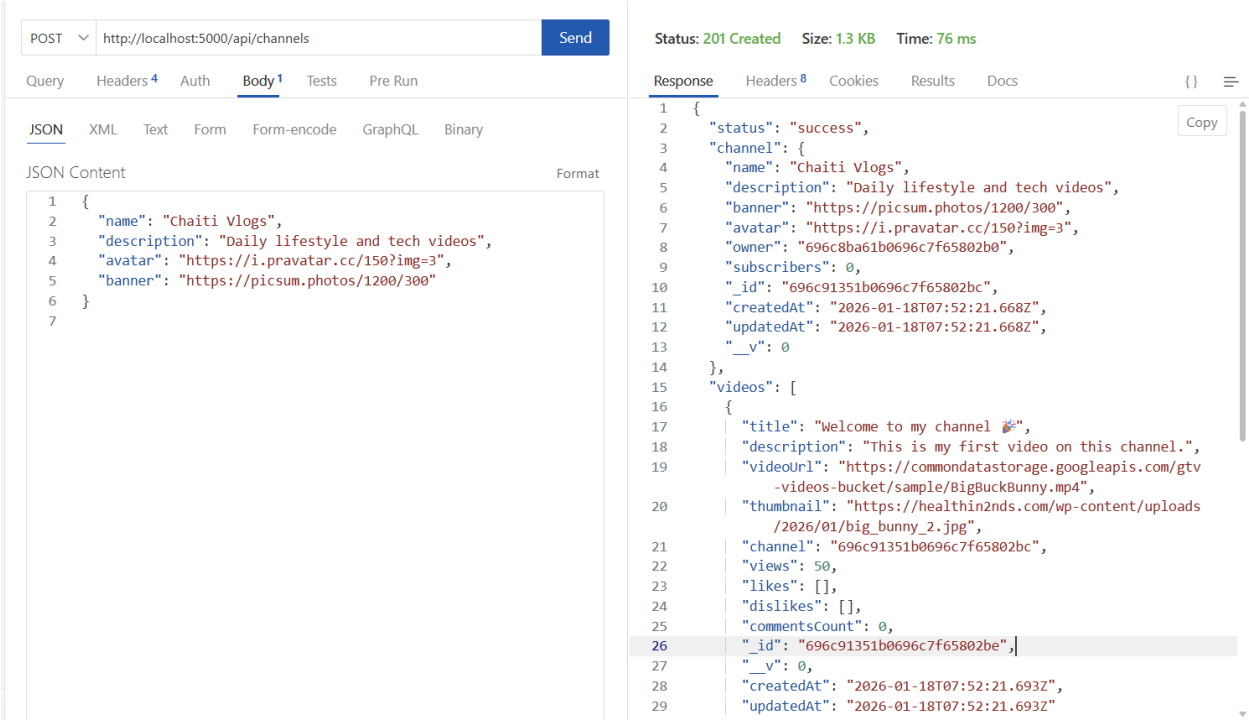
```
{
  "name": "Chaiti Vlogs",
  "description": "Daily lifestyle and tech videos",
  "avatar": "https://i.pravatar.cc/150?img=3",
  "banner": "https://picsum.photos/1200/300"
}
```

Response:

```
{
  "status": "success",
  "channel": {
    "name": "Chaiti Vlogs",
    "description": "Daily lifestyle and tech videos",
    "banner": "https://picsum.photos/1200/300",
    "avatar": "https://i.pravatar.cc/150?img=3",
    "owner": "696c8ba61b0696c7f65802b0",
    "subscribers": 0,
```

```
    "_id": "696c91351b0696c7f65802bc",
    "createdAt": "2026-01-18T07:52:21.668Z",
    "updatedAt": "2026-01-18T07:52:21.668Z",
    "__v": 0
  },
  "videos": [
    {
      "title": "Welcome to my channel 🎉",
      "description": "This is my first video on this channel.",
      "videoUrl":
"https://commondatastorage.googleapis.com/gtv-videos-bucket/sampl
e/BigBuckBunny.mp4",
      "thumbnail":
"https://healthin2nds.com/wp-content/uploads/2026/01/big_bunny_2.jp
g",
      "channel": "696c91351b0696c7f65802bc",
      "views": 50,
      "likes": [],
      "dislikes": [],
      "commentsCount": 0,
      "_id": "696c91351b0696c7f65802be",
      "__v": 0,
      "createdAt": "2026-01-18T07:52:21.693Z",
      "updatedAt": "2026-01-18T07:52:21.693Z"
    },
    {
      "title": "Channel Introduction 📢",
      "description": "Let me introduce what this channel is about.",
      "videoUrl":
"https://commondatastorage.googleapis.com/gtv-videos-bucket/sampl
e/BigBuckBunny.mp4",
```

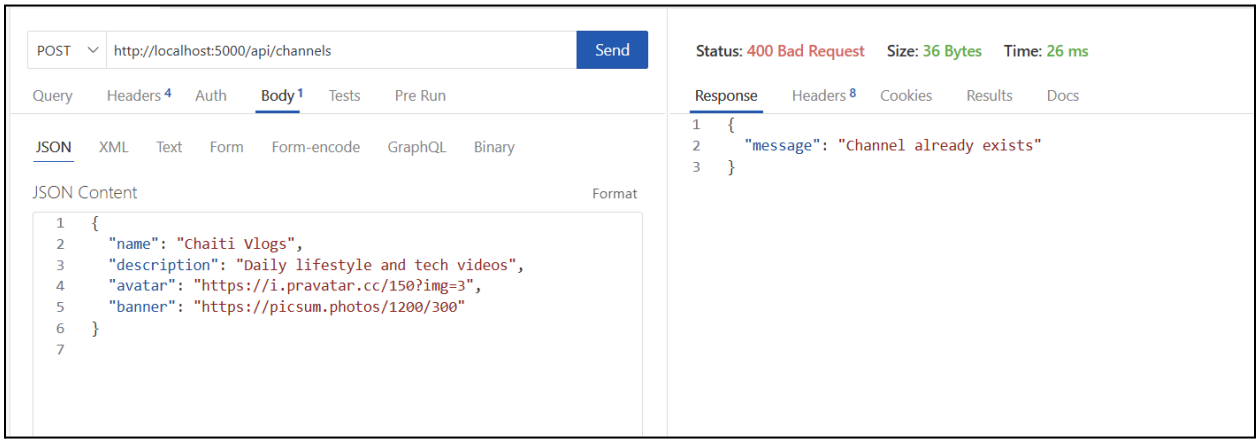
```
      "thumbnail":
"https://healthin2nds.com/wp-content/uploads/2026/01/big_bunny.jpg",
      "channel": "696c91351b0696c7f65802bc",
      "views": 50,
      "likes": [],
      "dislikes": [],
      "commentsCount": 0,
      "_id": "696c91351b0696c7f65802bf",
      "__v": 0,
      "createdAt": "2026-01-18T07:52:21.693Z",
      "updatedAt": "2026-01-18T07:52:21.693Z"
    }
  ]
}
```

Data is inserted in MongoDB Database


```
_id: ObjectId('696c91351b0696c7f65802bc')
name : "Chaiti Vlogs"
description : "Daily lifestyle and tech videos"
banner : "https://picsum.photos/1200/300"
avatar : "https://i.pravatar.cc/150?img=3"
owner : ObjectId('696c8ba61b0696c7f65802b0')
subscribers : 0
createdAt : 2026-01-18T07:52:21.668+00:00
updatedAt : 2026-01-18T07:52:21.668+00:00
__v : 0
```


Validation if user tries to create the channel again, shows “Channel Already Exists”



4) GET CHANNEL BY ID (+ VIDEOS)

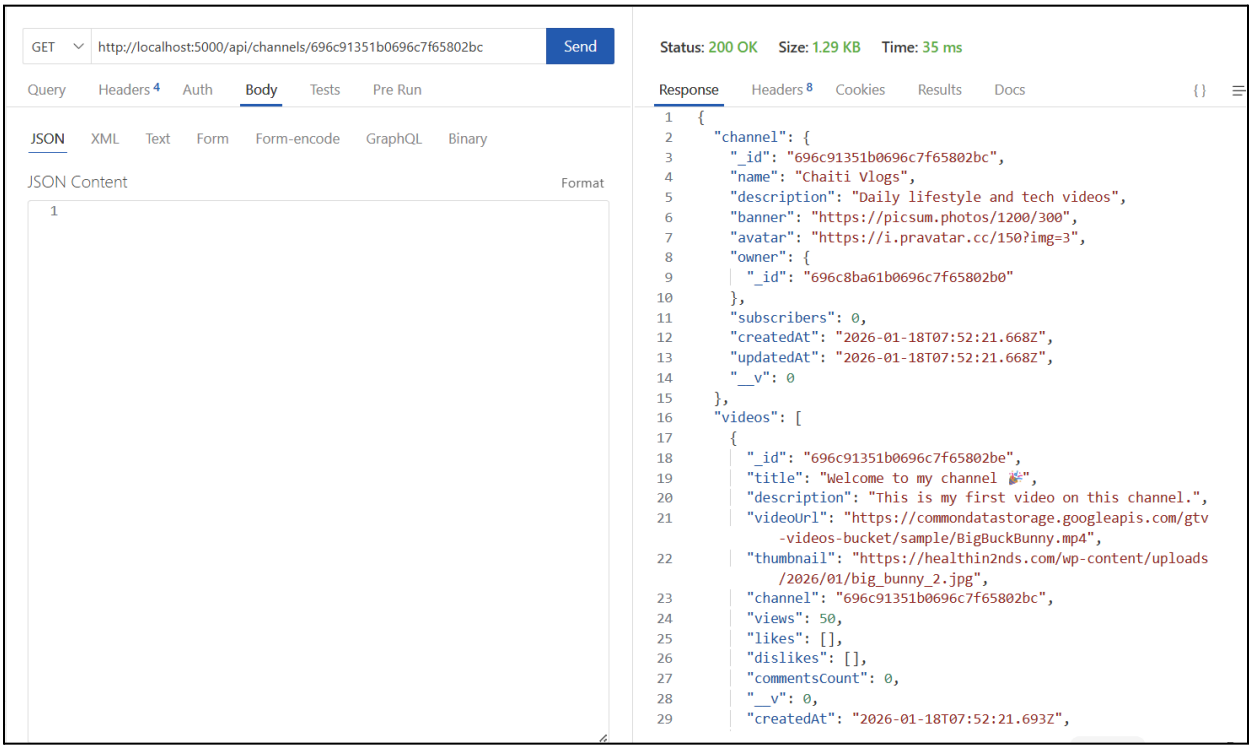
Request:
Method: GET
URL: http://localhost:5000/api/channels/696c91351b0696c7f65802bc
Body:
Headers:
Content-Type: application/json
Authorization: Bearer
eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjY5NmM4YmE2MWIwNjk2YzdmNjU4MDJiMCIsImlhdCI6MTc2ODcyMjEzOCwiZXhwIjoxNzY5MzI2OTM4fQ.rJrKgHlAkv6rKz93kbvPYCHV_xLMGrz2oYf0yRc7rXc

Response:


```
{
  "channel": {
    "_id": "696c91351b0696c7f65802bc",
    "name": "Chaiti Vlogs",
    "description": "Daily lifestyle and tech videos",
    "banner": "https://picsum.photos/1200/300",
    "avatar": "https://i.pravatar.cc/150?img=3",
    "owner": {
      "_id": "696c8ba61b0696c7f65802b0"
    },
    "subscribers": 0,
    "createdAt": "2026-01-18T07:52:21.668Z",
    "updatedAt": "2026-01-18T07:52:21.668Z",
    "__v": 0
```

```
  },
  "videos": [
    {
      "_id": "696c91351b0696c7f65802be",
      "title": "Welcome to my channel 🎉",
      "description": "This is my first video on this channel.",
      "videoUrl":
"https://commondatastorage.googleapis.com/gtv-videos-bucket/sample/BigBuckBunny.mp4",
      "thumbnail":
"https://healthin2nds.com/wp-content/uploads/2026/01/big_bunny_2.jpg",
      "channel": "696c91351b0696c7f65802bc",
      "views": 50,
      "likes": [],
      "dislikes": [],
      "commentsCount": 0,
      "__v": 0,
      "createdAt": "2026-01-18T07:52:21.693Z",
      "updatedAt": "2026-01-18T07:52:21.693Z"
    },
    {
      "_id": "696c91351b0696c7f65802bf",
      "title": "Channel Introduction 📢",
      "description": "Let me introduce what this channel is about.",
      "videoUrl":
"https://commondatastorage.googleapis.com/gtv-videos-bucket/sample/BigBuckBunny.mp4",
      "thumbnail":
"https://healthin2nds.com/wp-content/uploads/2026/01/big_bunny.jpg",
      "channel": "696c91351b0696c7f65802bc",
      "views": 50,
```

```
      "likes": [],
      "dislikes": [],
      "commentsCount": 0,
      "__v": 0,
      "createdAt": "2026-01-18T07:52:21.693Z",
      "updatedAt": "2026-01-18T07:52:21.693Z"
    }
  ]
}
```

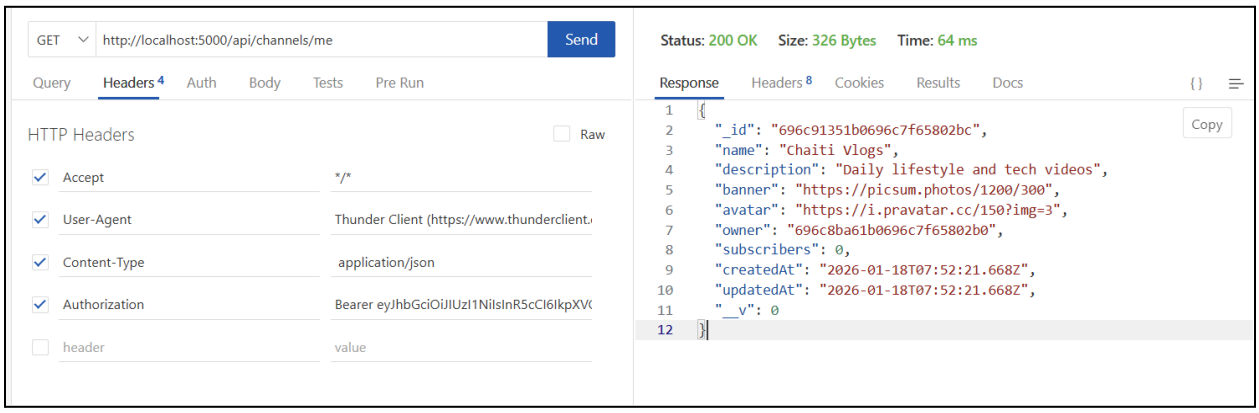



5) GET MY CHANNEL (Logged-in User)

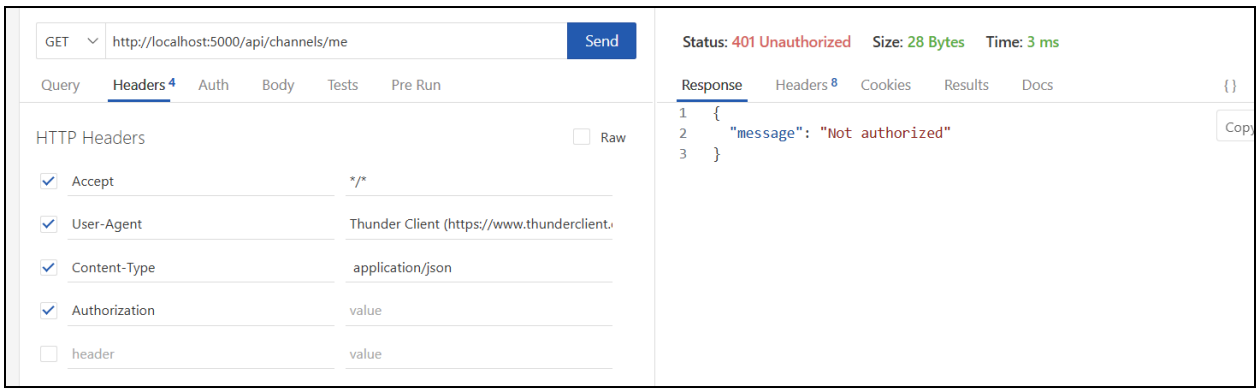
Request:
Method: GET
URL: http://localhost:5000/api/channels/me
Body:
Headers:
Content-Type: application/json
Authorization: Bearer
eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjY5NmM4YmE2MWIwNjk2YzdmNjU4MDJiMCIsImlhdCI6MTc2ODcyMjEzOCwiZXhwIjoxNzY5MzI2OTM4fQ.rJrKgHlAkv6rKz93kbvPYCHV_xLMGrz2oYf0yRc7rXc

Response:


```
{
  "_id": "696c91351b0696c7f65802bc",
  "name": "Chaiti Vlogs",
  "description": "Daily lifestyle and tech videos",
  "banner": "https://picsum.photos/1200/300",
  "avatar": "https://i.pravatar.cc/150?img=3",
  "owner": "696c8ba61b0696c7f65802b0",
  "subscribers": 0,
  "createdAt": "2026-01-18T07:52:21.668Z",
  "updatedAt": "2026-01-18T07:52:21.668Z",
  "__v": 0
}
```



Unauthorisated user wont see channel



6) GET ALL VIDEOS (Home Feed)

Request:

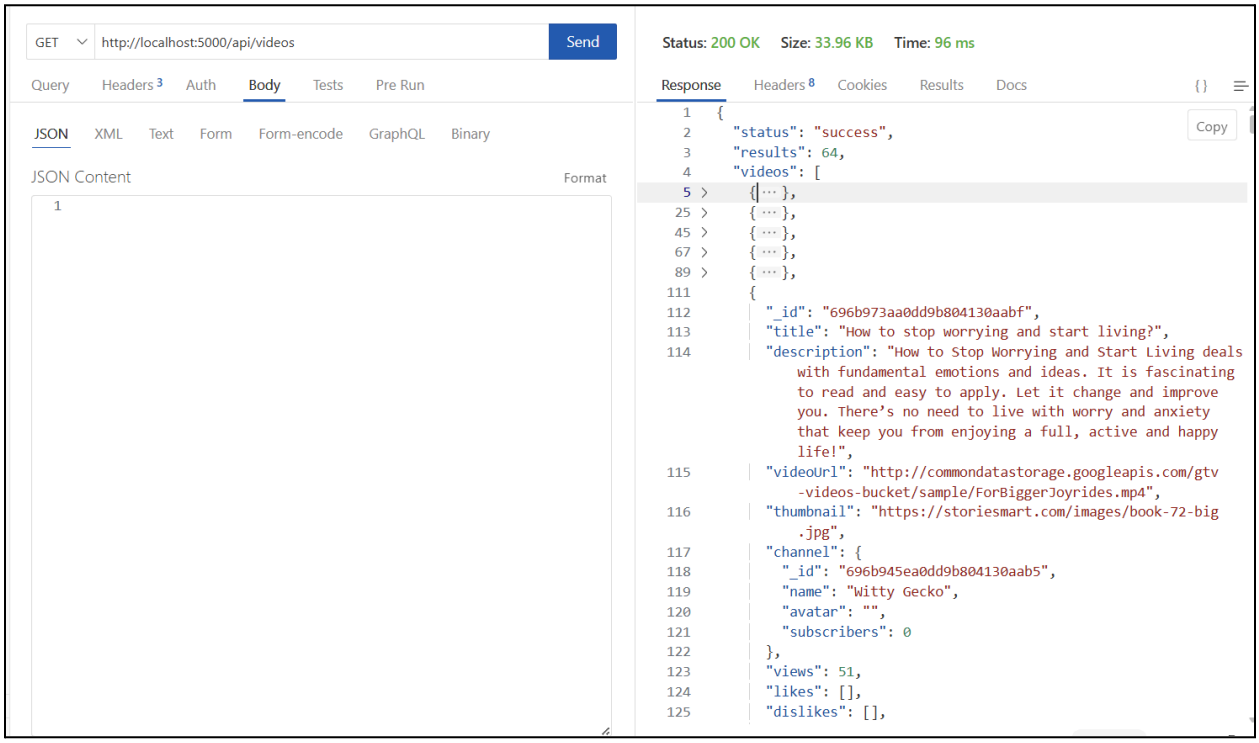
Method: GET

URL: http://localhost:5000/api/videos

Body:

Header:

Response: [Attached the screenshot due to large dataset]



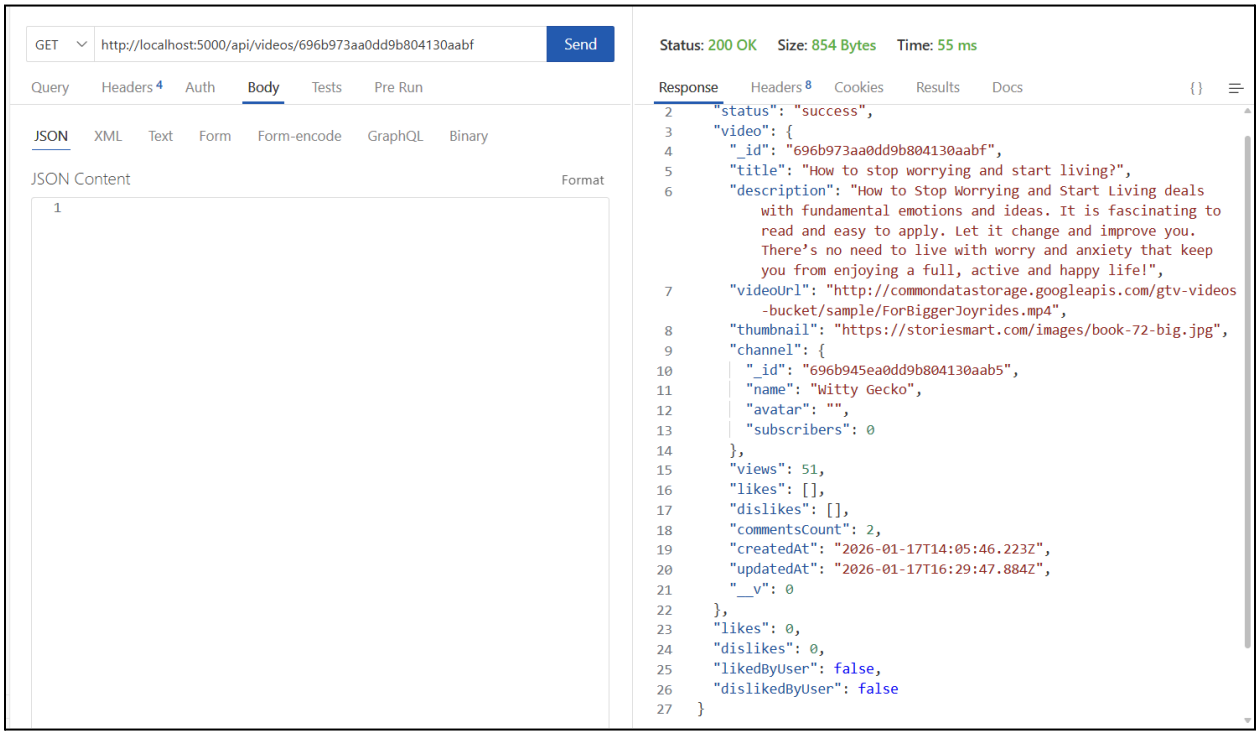
7) GET VIDEO BY ID (Watch Page)

Request:
Method: GET
URL: http://localhost:5000/api/videos/696b973aa0dd9b804130aabf
Body:
Headers:

Response:


```
{
  "status": "success",
  "video": {
    "_id": "696b973aa0dd9b804130aabf",
    "title": "How to stop worrying and start living?",
    "description": "How to Stop Worrying and Start Living deals with fundamental emotions and ideas. It is fascinating to read and easy to apply. Let it change and improve you. There’s no need to live with worry and anxiety that keep you from enjoying a full, active and happy life!",
    "videoUrl": "http://commondatastorage.googleapis.com/gtv-videos-bucket/sample/ForBiggerJoyrides.mp4",
    "thumbnail": "https://storiesmart.com/images/book-72-big.jpg",
    "channel": {
      "_id": "696b945ea0dd9b804130aab5",
      "name": "Witty Gecko",
      "avatar": "",
      "subscribers": 0
    },
    "views": 51,
```

```
    "likes": [],
    "dislikes": [],
    "commentsCount": 2,
    "createdAt": "2026-01-17T14:05:46.223Z",
    "updatedAt": "2026-01-17T16:29:47.884Z",
    "__v": 0
  },
  "likes": 0,
  "dislikes": 0,
  "likedByUser": false,
  "dislikedByUser": false
}
```

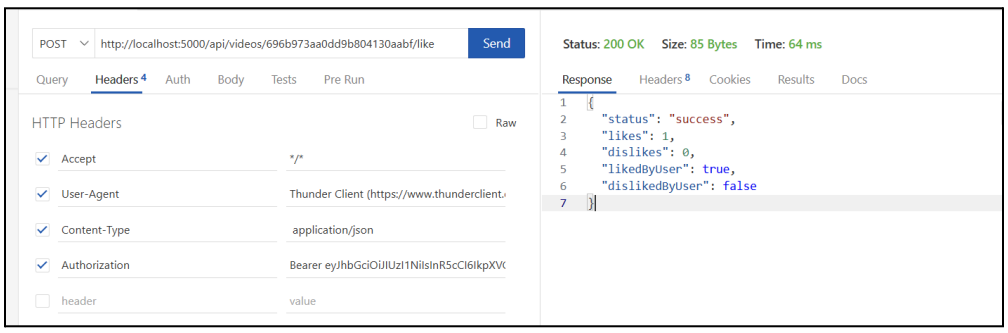



8) LIKE VIDEO

Request:
Method: POST
URL: http://localhost:5000/api/videos/:id/like
http://localhost:5000/api/videos/696b973aa0dd9b804130aabf/like
Body:
Headers:
Content-Type: application/json
Authorization: Bearer
eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjY5NmM4YmE2MWIwNjk2YzdmNjU4MDJiMCIsImlhdCI6MTc2ODcyMjEzOCwiZXhwIjoxNzY5MzI2OTM4fQ.rJrKgHlAkv6rKz93kbvPYCHV_xLMGrz2oYf0yRc7rXc

Response:


```
{
  "status": "success",
  "likes": 1,
  "dislikes": 0,
  "likedByUser": true,
  "dislikedByUser": false
}
```

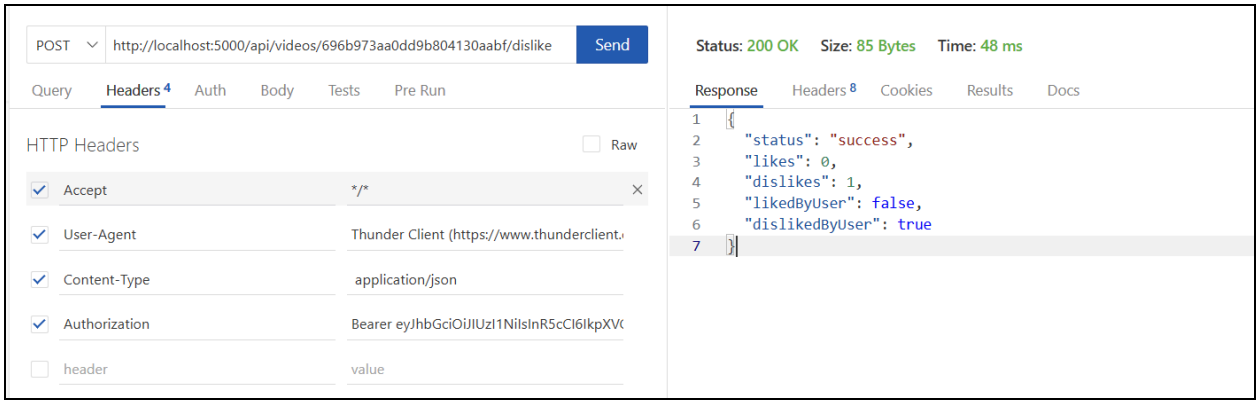



9) DISLIKE VIDEO

Request:
Method: POST
URL: http://localhost:5000/api/videos/:id/dislike
http://localhost:5000/api/videos/696b973aa0dd9b804130aabf/dislike
Body:
Headers:
Content-Type: application/json
Authorization: Bearer
eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjY5NmM4YmE2MWIwNjk2YzdmNjU4MDJiMCIsImlhdCI6MTc2ODcyMjEzOCwiZXhwIjoxNzY5MzI2OTM4fQ.rJrKgHlAkv6rKz93kbvPYCHV_xLMGrz2oYf0yRc7rXc

Response:


```
{
  "status": "success",
  "likes": 0,
  "dislikes": 1,
  "likedByUser": false,
  "dislikedByUser": true
}
```



10) COMMENT VIDEO

Request:

Method: POST

URL: http://localhost:5000/api/comments/:id

http://localhost:5000/api/comments/696b973aa0dd9b804130aabf

Body:

{

"text": "This video is awesome 🔥"

}

Headers:

Content-Type: application/json

Authorization: Bearer eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJpZCI6IjY5NmM4YmE2MWIwNjk2YzdmNjU4MDJiMCIsImlhdCI6MTc2ODcyMjEzOCwiZXhwIjoxNzY5MzI2OTM4fQ.rJrKgHlAkv6rKz93kbvPYCHV_xLMGrz2oYf0yRc7rXc

Response:


```
{
  "text": "This video is awesome 🔥",
  "video": "696b973aa0dd9b804130aabf",
  "user": {
    "_id": "696c8ba61b0696c7f65802b0",
    "name": "Sakuntala Mahato",
    "avatar": "https://i.pravatar.cc/150?img=6"
  },
  "likes": [],
  "parentComment": null,
  "_id": "696ca80f1b0696c7f65802df",
  "createdAt": "2026-01-18T09:29:51.595Z",
  "updatedAt": "2026-01-18T09:29:51.595Z",
  "__v": 0
}
```


—---------- Thank you —----------