The background is a light beige color with decorative elements. In the top left, there is a dark brown wavy line. In the top right, there is a dark brown branch with several leaves. In the bottom left, there are three dark brown starburst shapes. In the bottom right, there is a dark brown wavy line.

PROJECT PRESENTATION

Presented by: Habib Fatkhul Rohman

ROUTE PLANNER

Public Transport Route Finder

From:

Select starting point



To:

Select destination



Find Best Route

DATASET

You, 4 hours ago | 1 author (You)

line_number	line_name	stop_name	stop_latitude	stop_longitude	district	direction	direction_name
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 6086	-22.945098876953125	-43.20449447631836	Cosme Velho	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 5955	-22.94461250305176	-43.20428466796875	Cosme Velho	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 5525	-22.945600509643555	-43.20792770385742	Cosme Velho	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 5272	-22.94398498535156	-43.2081298828125	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 3980-5026	-22.942344665527344	-43.207916259765625	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 3980-5026	-22.93862724304199	-43.20742416381836	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Túnel André Rebouças, 3790	-22.93762588500977	-43.20454025268555	Rio Comprido	Castelo	Silvestre - Castelo
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 3780	-22.9367733001709	-43.20387268066406	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 3420	-22.935590744018555	-43.20283126831055	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Gomes Lopes, 12	-22.93520736694336	-43.20118713378906	Santa Teresa	Castelo	Silvestre - Castelo
006	Silvestre - Castelo (Circular)	Túnel do Rio Comprido, 3010	-22.934829711914066	-43.19975280761719	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 2644-2660	-22.93192481994629	-43.19684600830078	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Eliseu Visconti, 458-460	-22.929872512817386	-43.19539260864258	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Travessa Fallet, 700	-22.92803001403809	-43.19381332397461	Santa Teresa	Castelo	Silvestre - Castelo
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 1908	-22.927509307861328	-43.19337463378906	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 1772	-22.92705535888672	-43.19221878051758	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 1406-1410	-22.92497444152832	-43.18981552124024	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 1086	-22.924150466918945	-43.18743896484375	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 470	-22.92168235778809	-43.18598937988281	Santa Teresa	Castelo	Silvestre
006	Silvestre - Castelo (Circular)	Rua Almirante Alexandrino, 306	-22.920907974243164	-43.18476486206055	Santa Teresa	Castelo	Silvestre

source : <http://kaggle.com/datasets/igorbalteiro/bus-stops-in-rio-de-janeiro>

DATABASE

		id integer	* name text	
<input type="checkbox"/>	>	1	18º Batalhão de Polícia Militar	
<input type="checkbox"/>	>	2	Aeroporto RIOgaleão - Terminal	
<input type="checkbox"/>	>	3	Aeroporto Santos Dumont - Terr	
<input type="checkbox"/>	>	4	Aeroporto Santos Dumont - Terr	
<input type="checkbox"/>	>	5	Alto da Gávea	
<input type="checkbox"/>	>	6	Andaraí	
<input type="checkbox"/>	>	7	Antero de Quental	
<input type="checkbox"/>	>	8	Auto Estrada Lagoa-Barra, N/D	
<input type="checkbox"/>	>	9	AutoEstrada Grajaú - Jacarepagu	

	* source text	* target text	* weight double precision
>	BRS 1,2 - Avenida República do Paragu	BRS 1,2 - Treze de Maio	0.2885
>	BRS 1,2 - Treze de Maio	BRS 1,2,4,5 - Avenida Almirante Barrosc	0.3686
>	BRS 1,2 - Treze de Maio	BRS 1,2,3,4 - Cruz Vermelha	1.3028
>	BRS 1,2,4,5 - Avenida Almirante Barrosc	Rua Almirante Alexandrino, 1086	2.3372
>	BRS 1,2,4,5 - Avenida Almirante Barrosc	Largo das Neves, 11	2.0828
>	BRS 1,2,4,5 - Avenida Almirante Barrosc	Rua Doutor Agra, 90	2.6956
>	BRS 1,2,4,5 - Avenida Almirante Barrosc	BRS 1,2,5,I - Passos (pista lateral, desati	1.221
>	BRS 1,2,4,5 - Avenida Almirante Barrosc	BRT Cajueiros	51.2028
>	BRS 1,2,4,5 - Avenida Almirante Barrosc	BRS 2,4 - Cidade Nova (pista lateral)	3.2147

PROCESS CODE

```
@app.route("/find_route", methods=["GET", "POST"])
def find_route():
    nodes, edge_weights = load_graph_from_db()
    all_stops = sorted(nodes)

    result = None
    error = None

    if request.method == "POST":
        start = request.form.get("start")
        end = request.form.get("end")

        if start and end:
            if start == end:
                error = "Start and end points cannot be the same."
            else:
                route = get_shortest_route(edge_weights, start, end)
                if route:
                    if route['distance'] == float('inf'):
                        error = "No route found between the selected points."
                    distance_km = round(route['distance'], 2)
                    duration = distance_km * 5 # 5 menit per km
                    duration_hours = round(minutes_to_hours(duration), 2)

                    result = {
                        "distance": f"{distance_km} km",
                        "duration": f"{duration_hours} hours" if duration_hours >= 1 else f"{rou
                        "path": route['path']
                    }
                else:
                    error = "No route found between the selected points."
            else:
                error = "Please select both start and end points."
```

```
def get_shortest_route(edge_weights, start, end):
    queue = [(0, start, [start])]

    # Dictionary untuk menyimpan jarak minimum ke tiap node
    visited = {}

    while queue:
        current_dist, current_node, path = heapq.heappop(queue)

        # Jika node sudah dikunjungi dengan jarak lebih kecil, skip
        if current_node in visited and visited[current_node] <= current_dist:
            continue

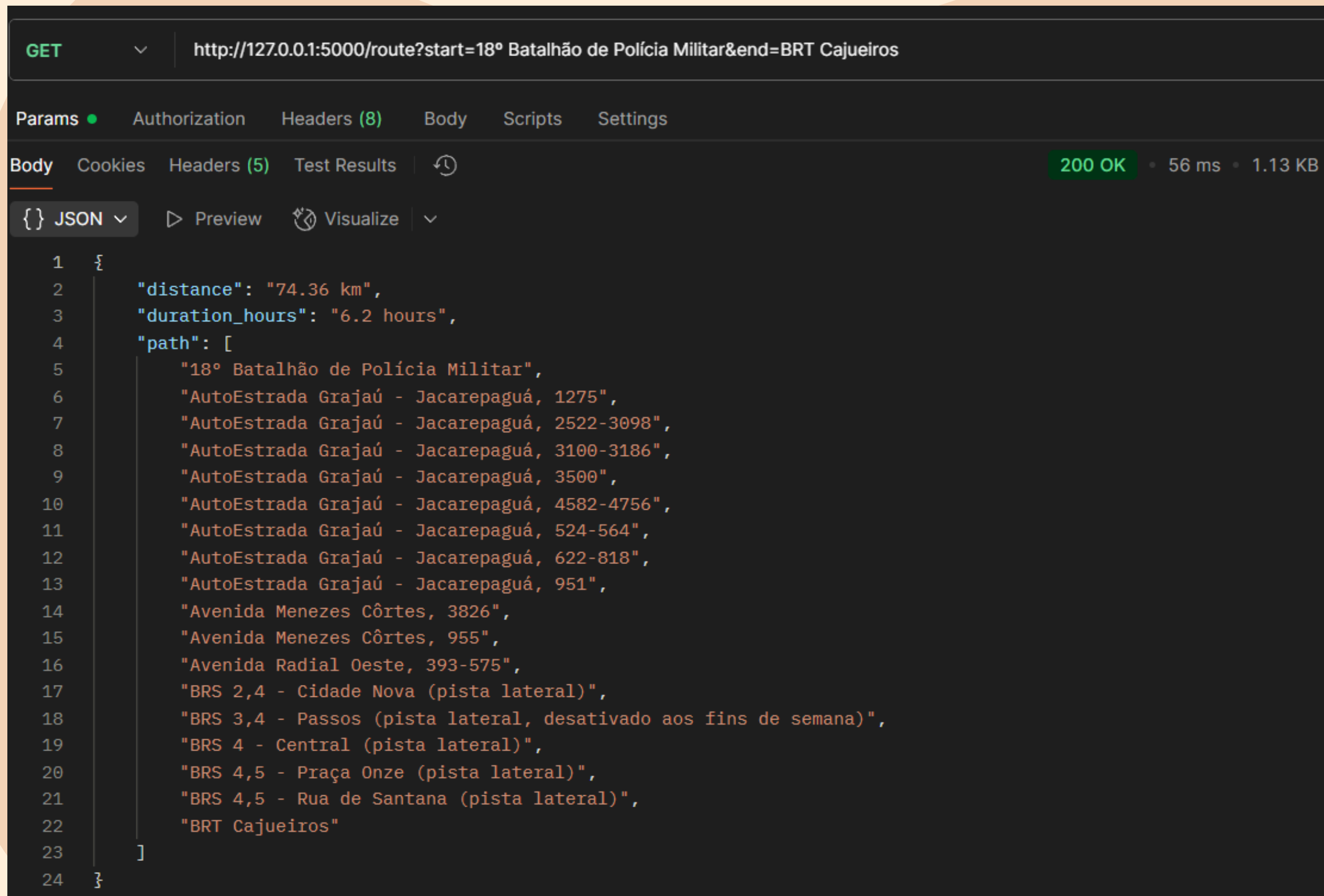
        # Tandai node sudah dikunjungi
        visited[current_node] = current_dist

        # Kalau sudah sampai tujuan, return hasil
        if current_node == end:
            return {
                'distance': round(current_dist, 4),
                'path': path
            }

        # Tetangga node sekarang
        neighbors = edge_weights.get(current_node, {})
        for neighbor, weight in neighbors.items():
            if neighbor not in visited:
                heapq.heappush(queue, (
                    current_dist + weight,
                    neighbor,
                    path + [neighbor]
                ))

    return {
        'distance': float('inf'),
        'path': []
    }
```

RESULT API



```
GET http://127.0.0.1:5000/route?start=18º Batalhão de Polícia Militar&end=BRT Cajueiros


Params • Authorization Headers (8) Body Scripts Settings

Body Cookies Headers (5) Test Results ↻ 200 OK • 56 ms • 1.13 KB

{} JSON ▾ ▶ Preview 🖼 Visualize ▾

1  {
2    "distance": "74.36 km",
3    "duration_hours": "6.2 hours",
4    "path": [
5      "18º Batalhão de Polícia Militar",
6      "AutoEstrada Grajaú - Jacarepaguá, 1275",
7      "AutoEstrada Grajaú - Jacarepaguá, 2522-3098",
8      "AutoEstrada Grajaú - Jacarepaguá, 3100-3186",
9      "AutoEstrada Grajaú - Jacarepaguá, 3500",
10     "AutoEstrada Grajaú - Jacarepaguá, 4582-4756",
11     "AutoEstrada Grajaú - Jacarepaguá, 524-564",
12     "AutoEstrada Grajaú - Jacarepaguá, 622-818",
13     "AutoEstrada Grajaú - Jacarepaguá, 951",
14     "Avenida Menezes Côrtes, 3826",
15     "Avenida Menezes Côrtes, 955",
16     "Avenida Radial Oeste, 393-575",
17     "BRS 2,4 - Cidade Nova (pista lateral)",
18     "BRS 3,4 - Passos (pista lateral, desativado aos fins de semana)",
19     "BRS 4 - Central (pista lateral)",
20     "BRS 4,5 - Praça Onze (pista lateral)",
21     "BRS 4,5 - Rua de Santana (pista lateral)",
22     "BRT Cajueiros"
23   ]
24 }
```

RESULT UI

 **Public Transport Route Finder**

From:

AutoEstrada Grajaú - Jacarepaguá, 3500


▼

To:

AutoEstrada Grajaú - Jacarepaguá, 4582-4756

▼

Find Best Route

 **Route Details**

Distance

0.58 km

Duration

2.9 minutes

Route Path:

1

AutoEstrada Grajaú - Jacarepaguá, 3500

2

AutoEstrada Grajaú - Jacarepaguá, 4582-4756

IMAGE COMPRESSION

Drag & Drop Image

Pilih File Tidak ada file yang dipilih

PROCESS CODE

```
@app.route("/upload", methods=["POST"])
def upload():
    file = request.files['file']
    filename = secure_filename(file.filename)
    img = Image.open(file)

    os.makedirs(app.config['UPLOAD_FOLDER'], exist_ok=True)

    original_path = os.path.join(app.config['UPLOAD_FOLDER'], f"{filename}_original")
    file.seek(0)
    file.save(original_path) if hasattr(file, "save") else
    original_size = os.path.getsize(original_path)

    compressed = compress_image(img, n_colors=16)
    thumb = gen_thumbnail(img)

    hashed = hash_filename_thumbnail(filename)
    img_path = f"{hashed}_compressed.png"
    thumb_path = f"{hashed}_thumb.png"

    compressed.save(os.path.join(app.config['UPLOAD_FOLDER'], img_path))
    thumb.save(os.path.join(app.config['UPLOAD_FOLDER'], thumb_path))

    compressed_size = os.path.getsize(os.path.join(app.config['UPLOAD_FOLDER'], img_path))

    # Save to DB
    db.session.add(ImageMeta(
        filename=filename,
        mimetype=file.mimetype,
        size=compressed_size,
        hash=hashed
    ))
    db.session.commit()
```

```
def compress_image(image: Image.Image, n_colors=16):
    img = image.convert("RGB")
    np_img = np.array(img)
    h, w = np_img.shape[:2]
    flat_img = np_img.reshape(-1, 3)

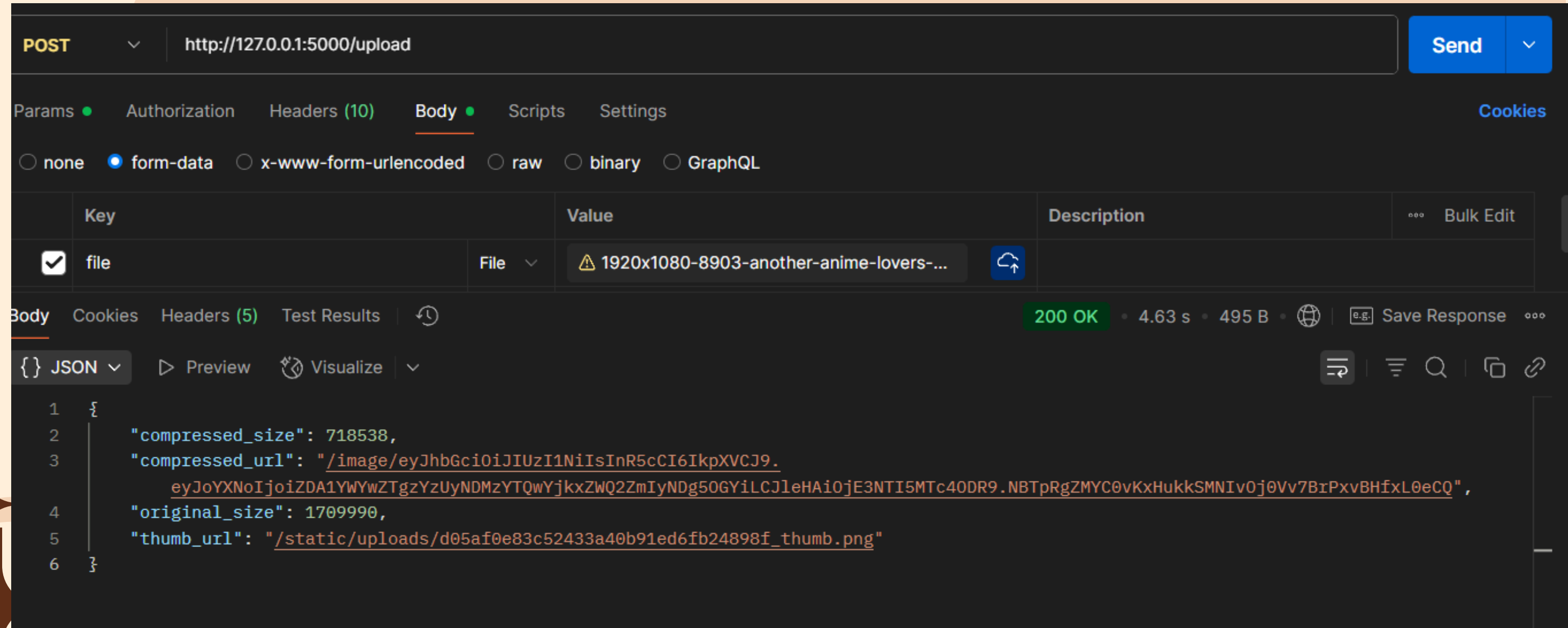
    kmeans = KMeans(n_clusters=n_colors).fit(flat_img)
    compressed = kmeans.cluster_centers_[kmeans.labels_].reshape(h, w, 3)
    return Image.fromarray(compressed)
```

```
def gen_thumbnail(image: Image.Image, thumbnail_size=(128, 128)):
    thumbnail = image.copy()
    thumbnail.thumbnail(thumbnail_size)
    return thumbnail
```

```
def hash_filename_thumbnail(filename):
    return hashlib.md5(filename.encode()).hexdigest()
```

You, 2 h

RESULT API



The screenshot displays a REST client interface with a POST request to `http://127.0.0.1:5000/upload`. The request is configured with the `form-data` type, and a file named `1920x1080-8903-another-anime-lovers-...` is attached. The response is a `200 OK` status, indicating a successful upload. The response body is shown in JSON format, containing details about the uploaded file, including its compressed size, original size, and URLs for the compressed and thumbnail versions.

POST `http://127.0.0.1:5000/upload` **Send**

Params **Authorization** **Headers (10)** **Body** Scripts Settings **Cookies**

☐ none ☒ form-data ☐ x-www-form-urlencoded ☐ raw ☐ binary ☐ GraphQL

	Key	Value	Description
<input checked="" type="checkbox"/>	file	File <code>1920x1080-8903-another-anime-lovers-...</code>	

Body **Cookies** **Headers (5)** **Test Results** **200 OK** • 4.63 s • 495 B • **Save Response**

JSON **Preview** **Visualize**

```
1 {
2   "compressed_size": 718538,
3   "compressed_url": "/image/eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJ0YXNoIjoizDA1YWYwZTgzYzUyNDMzYTQwYjYjZmIyNDg5OGYiLCJleHAiOjE3NTI5MTc0DR9.NBTpRgZMYC0vKxHukkSMNIv0j0Vv7BrPxvBHfxL0eCQ",
4   "original_size": 1709990,
5   "thumb_url": "/static/uploads/d05af0e83c52433a40b91ed6fb24898f_thumb.png"
6 }
```

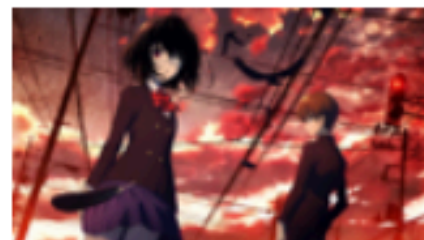
RESULT UI

Drag & Drop Image

Pilih File 1920x1080-8...allpaper-hd.jpg

Original size: 1669.91 KB
Compressed size: 712.43 KB
Compression ratio: 42.66%

Compressed: [Open](#)



RESULT DB DAN LOCAL

id integer	filename varchar(255)	mimetype varchar(5)	size integer	hash varchar(64)
10	1920x1080-8903-another-anime-lovers-1	image/jpeg	732679	d05af0e83c52433a40b91ed6fb24898f
11	WhatsApp_Image_2024-06-30_at_8.42.13	image/jpeg	91313	10993bd44063e552c24b542bb29c3a05
12	1920x1080-8903-another-anime-lovers-1	image/jpeg	755875	d05af0e83c52433a40b91ed6fb24898f
13	1920x1080-8903-another-anime-lovers-1	image/jpeg	76	
14	1920x1080-8903-another-anime-lovers-1	image/jpeg	71	
15	1920x1080-8903-another-anime-lovers-1	image/jpeg	78	
16	1920x1080-8903-another-anime-lovers-1	image/jpeg	76	
17	1920x1080-8903-another-anime-lovers-1	image/jpeg	72	
18	1920x1080-8903-another-anime-lovers-1	image/jpeg	71	
19	anime-girl-portrait-hair-eyes-12122-20	image/jpeg	15	

static \ uploads

50c61efbfbbf5607abc40d3bd11da736_c...

50c61efbfbbf5607abc40d3bd11da736_th...

491b47fee232e05612fd6ed3c69a0749_c...

491b47fee232e05612fd6ed3c69a0749_th...

10993bd44063e552c24b542bb29c3a05_c...

10993bd44063e552c24b542bb29c3a05_t...

d05af0e83c52433a40b91ed6fb24898f_co...

d05af0e83c52433a40b91ed6fb24898f_th...

THANK
YOU

