# GreenScape Navi – Project Documentation

**Project Title:** GreenScape Navi<br>
**Course:** IT Project<br>
**Semester:** SS 2025<br>
**Institution: FH Technikum Wien**

This website is the result of a collaborative project between seven students from **King Mongkut's University of Technology North Bangkok (Bangkok, Thailand)** and **FH Technikum Wien (Vienna, Austria)**.

**Team Members:**

- Neda Stefanovic (Lead)
- Lena Gampenrieder
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- William
- Beem
- Jai Jai
- Liam / Tanja

GreenSpace-main.zip
https://github.com/if24b210/GreenSpace

# Contents

## 1. Project Overview

**GreenScape Navi** is a web application designed to assist users in discovering and planning visits to public green spaces in Vienna. It combines maps, weather forecasts, routing, and an automatically generated packing list, using open data provided by the City of Vienna.

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## 2. Core Features

- **Interactive Map**: Display of parks, playgrounds, cemeteries, and other green spaces using Leaflet.js.
- **Weather Forecast**: Integration of the Open-Meteo API to display current and future weather data including icons.
- **Routing**: Calculation and display of routes to selected parks using the Open Routing Service.
- **Packing List**: Automatically generated based on weather and user preferences.
- **Filters**: Options for family- and dog-friendly parks and additional filter criteria.
- **Local Storage**: Use of local storage for weather data, icons, and planned visits.

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## 3. Technology Stack

| Component | Technology |
|---|---|
| Frontend | HTML, CSS (Bootstrap), JavaScript |
| Maps | Leaflet.js |
| Icons | Bootstrap Icons, custom SVGs |
| APIs | Open Data Vienna, Open-Meteo, Open Routing Service |

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## 4. Project Structure

```
GreenScape/
|-- assets/            # CSS, JS, images, fonts
|-- data/              # GeoJSON data (parks, playgrounds, etc.)
|-- templates/         # HTML templates for weather, routing, etc.
|-- includes/          # Reusable HTML blocks (filters, etc.)
|-- fallback_videos/   # Offline fallback videos
|-- screenshots/       # Documentation images
```

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## 5. Key JavaScript Files

| File | Description |
|---|---|
| weather.js | Retrieves weather data, caches icons, updates UI |
| packingList.js | Generates packing list based on weather and user input |
| routing.js | Handles routing and map display |
| load_playgrounds.js, load_parks.js, load_cemeteries.js | Load GeoJSON data into window context |
| map_helper.js | Utility functions for Leaflet marker handling |

## 6. Data Flow & Functionality

1. **Load Data**: GeoJSON files are loaded from online or local sources and stored in window.
2. **Map Rendering**: Leaflet.js is used to display markers and layers.
3. **Weather**: Weather data is fetched from Open-Meteo and icons are cached.
4. **Routing**: Routes from the user’s location to parks are calculated and displayed.
5. **Packing List**: Generated dynamically based on the forecast and user preferences.

```
// Load park data with fallback
async function loadParksData() {
  try {
    const response = await fetch('https://data.wien.gv.at/parks.json');
    if (!response.ok) throw new Error('Online data not available');
    const data = await response.json();
    window.greenSpaces = data.features;
  } catch (e) {
    const fallback = await fetch('/data/parks_fallback.json');
    const data = await fallback.json();
    window.greenSpaces = data.features;
  }
}
```

## 7. Code Highlights

### weather.js – Load and Display Weather

```
async function fetchWeather(lat, lon) {
  const url = `https://api.open-meteo.com/v1/forecast?latitude=${lat}&longitude=${lon}&hourly=temperature_2m,weathercode&current_weather=true`;
  const response = await fetch(url);
  const data = await response.json();
```

```
    localStorage.setItem('weatherData', JSON.stringify(data));
    updateWeatherUI(data);
}

function cacheWeatherIcon(code, iconUrl) {
    localStorage.setItem(`weatherIcon_${code}`, iconUrl);
}
```

## routing.js – Calculate and Display Route

```
async function calculateRoute(start, end) {
    const url = `https://api.openrouteservice.org/v2/directions/foot-walking?api_key=YOUR_API_KEY&start=${start}&end=${end}`;
    const response = await fetch(url);
    const data = await response.json();
    drawRouteOnMap(data.features[0].geometry.coordinates);
}

function drawRouteOnMap(coordinates) {
    L.polyline(coordinates.map(c => [c[1], c[0]]), { color: 'blue' }).addTo(map);
}
```

## packingList.js – Generate Packing List

```
function generatePackingList(weather, preferences) {
    const list = [];
    if (weather.temperature < 15) list.push('Jacket');
    if (weather.code === 'rain') list.push('Umbrella');
    if (preferences.includes('Children')) list.push('Toys');
    return list;
}
```

## index.html – Search, Filter & Map

```
function searchGreenSpaces(query) {
    return greenSpaces.filter(space =>
        space.name.toLowerCase().includes(query.toLowerCase())
    );
}

document.getElementById('searchInput').addEventListener('input', function(e) {
    const results = searchGreenSpaces(e.target.value);
    displaySearchResults(results);
});

function filterGreenSpaces(filters) {
    return greenSpaces.filter(space =>
        (!filters.kids || space.kidsFriendly) &&
        (!filters.dogs || space.dogsAllowed)
    );
}
```

```
greenSpaces.forEach(space => {
  L.marker([space.lat, space.lon])
    .addTo(map)
    .bindPopup(`<b>${space.name}</b><br>${space.description}`);
});
```

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## 8. Highlights

- **Fallback System**: Local JSON data is used if online data is unavailable.
- **Accessibility**: Skip-link and responsive Bootstrap layout.
- **Caching**: Icons and data are cached using Local Storage.
- **Main Features on Homepage**:
    - Interactive park map
    - Quick search and filters
    - Weather preview
    - Route-to-park button

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## 9. Conclusion & Outlook

**GreenScape Navi** is a modern, client-side web application focused on usability and intelligent open data integration. It features modular architecture, personalization, and offline support.

**Future potential:**

- Expansion to other cities
- User accounts and cloud sync
- Voice interaction
- AI-based suggestions and trip planning

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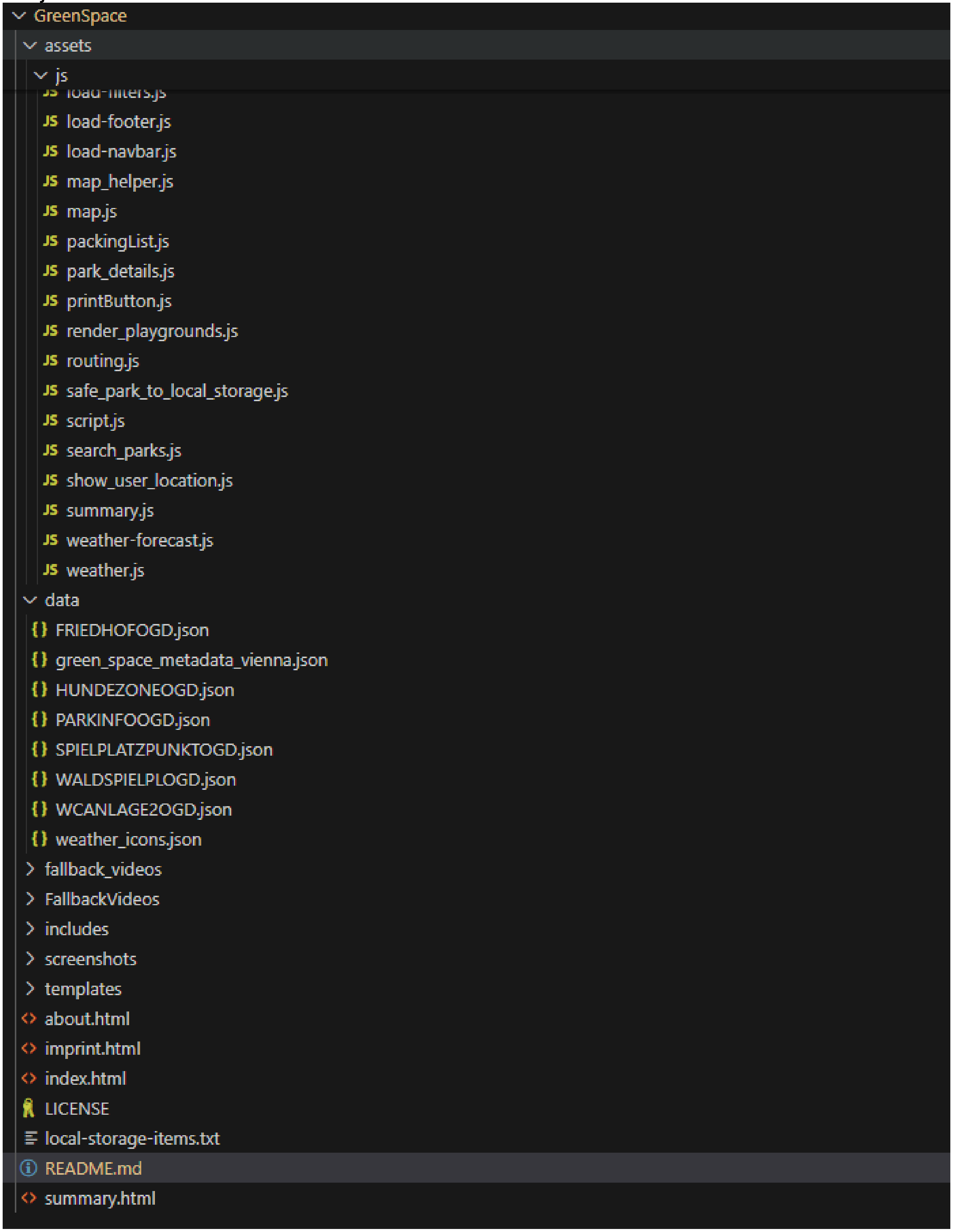
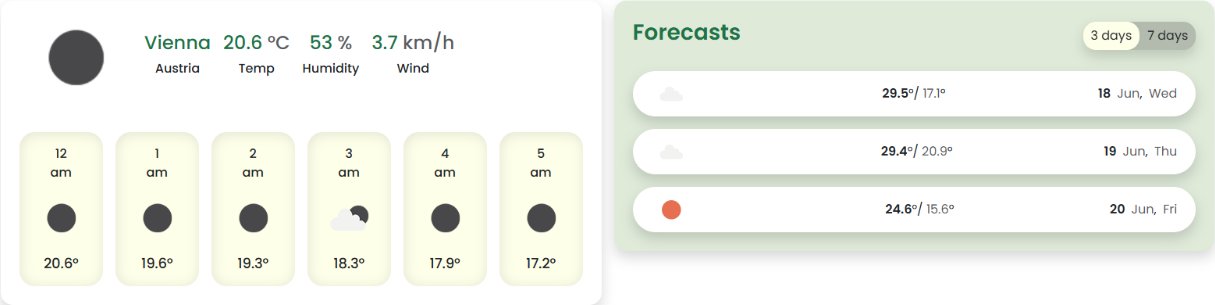
Inclusion:
Projekt Structure



```
GreenSpace
  assets
    js
      load-filters.js
      load-footer.js
      load-navbar.js
      map_helper.js
      map.js
      packingList.js
      park_details.js
      printButton.js
      render_playgrounds.js
      routing.js
      safe_park_to_local_storage.js
      script.js
      search_parks.js
      show_user_location.js
      summary.js
      weather-forecast.js
      weather.js
    data
      FRIEDHOFOGD.json
      green_space_metadata_vienna.json
      HUNDEZONEOGD.json
      PARKINFOOGD.json
      SPIELPLATZPUNKTOGD.json
      WALDSPIELPLOGD.json
      WCANLAGE2OGD.json
      weather_icons.json
    fallback_videos
    FallbackVideos
    includes
    screenshots
    templates
    about.html
    imprint.html
    index.html
    LICENSE
    local-storage-items.txt
    README.md
    summary.html
```

## Weather



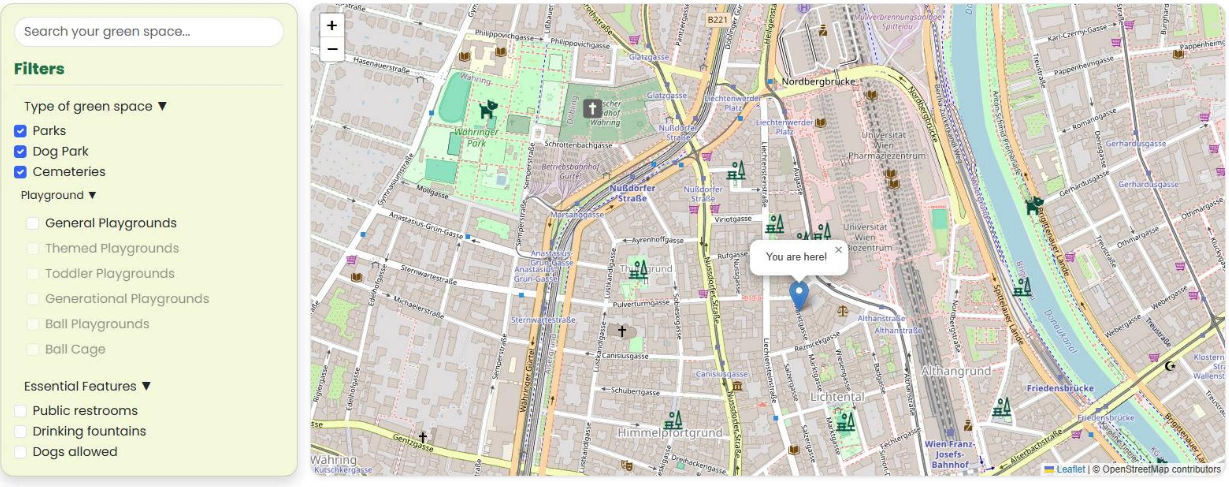
Vienna 20.6 °C 53 % 3.7 km/h
Austria Temp Humidity Wind

| 12 am | 1 am | 2 am | 3 am | 4 am | 5 am |
|---|---|---|---|---|---|
| 20.6° | 19.6° | 19.3° | 18.3° | 17.9° | 17.2° |

**Forecasts** 3 days 7 days

| | |
|---|---|
| 29.5°/ 17.1° | 18 Jun, Wed |
| 29.4°/ 20.9° | 19 Jun, Thu |
| 24.6°/ 15.6° | 20 Jun, Fri |

## Map



Search your green space...

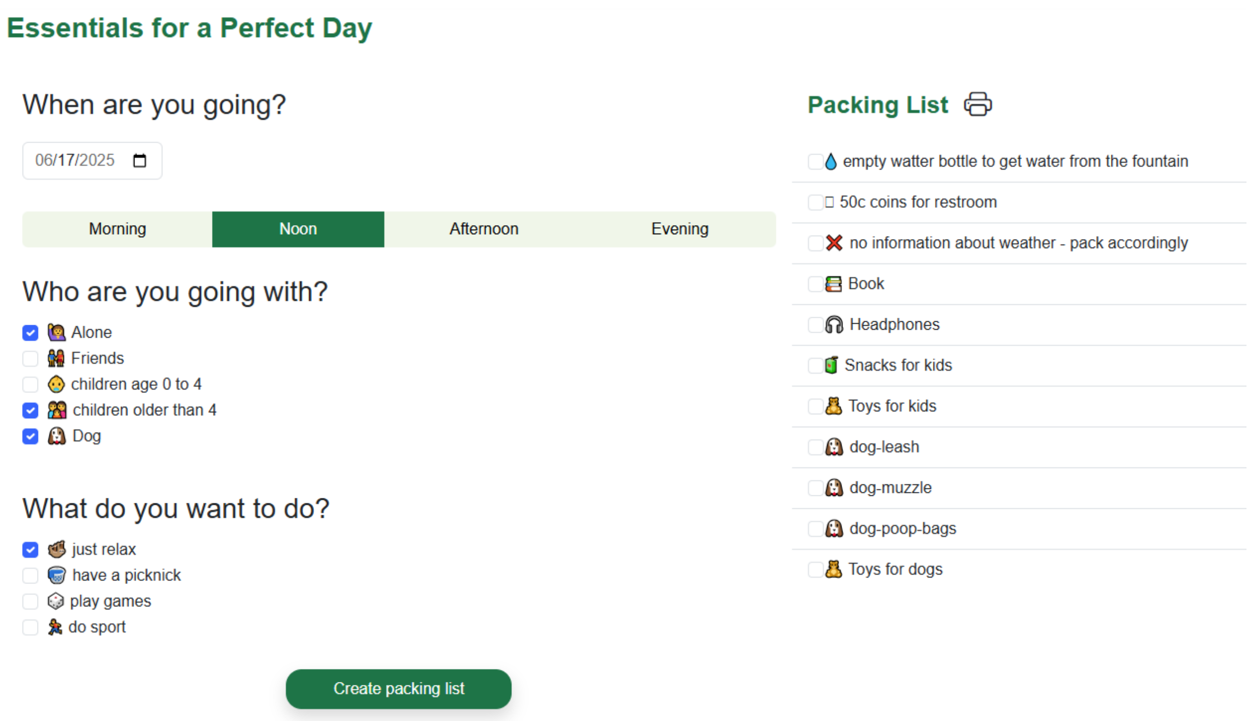
**Filters**

Type of green space ▼
- ☑ Parks
- ☑ Dog Park
- ☑ Cemeteries

Playground ▼
- □ General Playgrounds
- □ Themed Playgrounds
- □ Toddler Playgrounds
- □ Generational Playgrounds
- □ Ball Playgrounds
- □ Ball Cage

Essential Features ▼
- □ Public restrooms
- □ Drinking fountains
- □ Dogs allowed

+
−
You are here!
Nordbergbrücke
Währinger Park
Nußdorfer Straße
Universität Wien Pharmaziezentrum
Universität Wien Biozentrum
Althangrund
Lichtental
Himmelpfortgrund
Friedensbrücke
Wien Franz-Josefs-Bahnhof
Währing
Leaflet | © OpenStreetMap contributors



## Essentials for a Perfect Day

### When are you going?

06/17/2025

| Morning | **Noon** | Afternoon | Evening |
|---|---|---|---|

### Who are you going with?

- ☑ 🙋 Alone
- ☐ 👫 Friends
- ☐ 👶 children age 0 to 4
- ☑ 🧑‍🤝‍🧑 children older than 4
- ☑ 🐶 Dog

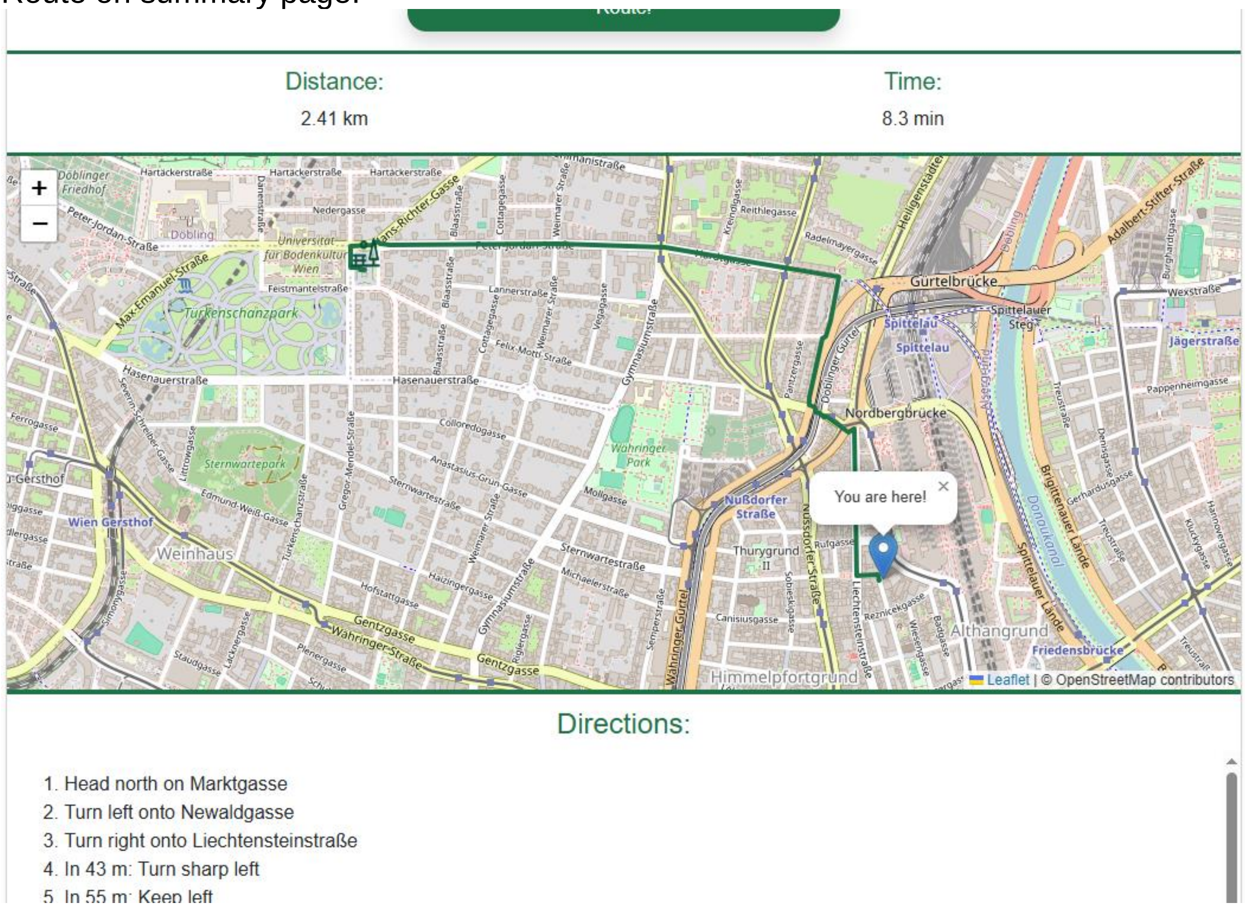
### What do you want to do?

- ☑ just relax
- ☐ have a picknick
- ☐ play games
- ☐ do sport

### Packing List

- ☐ 💧 empty watter bottle to get water from the fountain
- ☐ □ 50c coins for restroom
- ☐ ❌ no information about weather - pack accordingly
- ☐ 📚 Book
- ☐ 🎧 Headphones
- ☐ 🧃 Snacks for kids
- ☐ 🧸 Toys for kids
- ☐ 🐶 dog-leash
- ☐ 🐶 dog-muzzle
- ☐ 🐶 dog-poop-bags
- ☐ 🧸 Toys for dogs

Route on summary page:



Distance:
2.41 km

Time:
8.3 min

Directions:

1. Head north on Marktgasse
2. Turn left onto Newaldgasse
3. Turn right onto Liechtensteinstraße
4. In 43 m: Turn sharp left
5. In 55 m: Keep left