Introduction

Language Technology and Web Applications

Johannes Graën

Department of Computational Linguistics &
Linguistic Research Infrastructure (LiRI)

September 20, 2023

Topics

1. Organization

2. What is a web application?

3. How to deploy a web application using GitLab

Topics

1. Organization
2. What is a web application?
3. How to deploy a web application using GitLab

Content of this Class

Web Development

Data Management

Data Visualization

… from the perspective of **Computational Linguistics** and **Language Technology**

Main Learning Goals

1. You can design and create **web applications**
2. You can design and use relational **databases** (in relation to 1)
3. You can **work in a team** on a software project over several months
4. You can **document and present** your project

Complete learning goals in the course catalog:
https://studentservices.uzh.ch/uzh/anonym/vvz/index.html#/details/2023/003/SM/50941585/

Prerequisites

- Required:
  Programming Techniques in Computational Linguistics 1
  (or comparable experience)

- Strongly recommended:
  Programming Techniques in Computational Linguistics 2

Responsible People

Lecture:

- Johannes Graën <johannes.graen@linguistik.uzh.ch>
- Nikolina Rajović <nikolina.rajovic@linguistik.uzh.ch>
- Igor Mustač <igor.mustac@linguistik.uzh.ch>

Tutorial:

- Elina Stüssi <elina.stuessi@uzh.ch>
- Lea Müller <lea.mueller6@uzh.ch>

Schedule


Learning Phase
Project Phase
E
P
September
October
November
December
January

Organization

9 ECTS

Lecture:

- Wednesday, 2:00 pm
- Learning phase: room AND-3-02
- Project phase: virtual on Zoom

Tutorial:

- Friday, 10:15 am, room AND-2-48

Let's Collect Examples of Language Technology Web Applications!

To start:

Google Ngram Viewer:
https://books.google.com/ngrams

DeepL:
https://www.deepl.com

SA
DS

Syntaktischer Atlas der deutschen Schweiz (SADS):
https://dialektsyntax.linguistik.uzh.ch

https://t.ly/DH6QH

Learning more about you

Take 5 minutes to discuss with your neighbor:

- What is your background?
- Prior experience with databases or web technologies? (not required)
- Name another example of a *language technology web application* you know

Project

- 3 team members
  (will be assigned in two weeks based on your preferred project ideas)
- Goal: Create a **web application** related to **language technology** that uses a **database**
- We will support you with advice and practical tips
- You can use any programming language or framework (but the lecture makes some good recommendations)

Final Grade

- ⅓ Exam
- ⅓ Group Presentations
- ⅓ Individual Project Report (due 17th January, 2024)

Learning Phase

On-site Exam:

- **December 20, 2023, at 2:00 pm**
- Covers everything from the lectures and exercises until that point

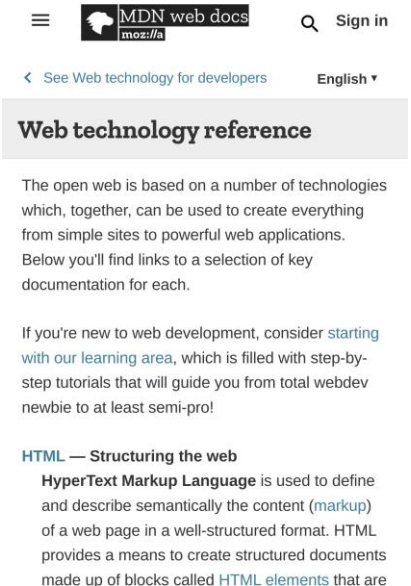
Exercises:

- Strongly recommended preparation for the Exam
- Not graded, but a reference solution is made available

Literature for this Class

MDN Web Docs

https://developer.mozilla.org/



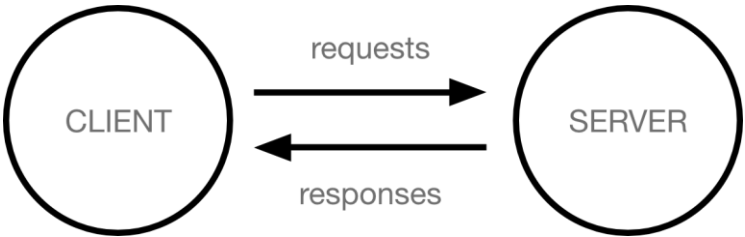
Learning Goals for this Week

- You can explain in simple terms what a web application is
- You can use the Web Development Tools of your browser
- You can deploy a web application using GitLab CI

Topics

1. Organization
2. What is a web application?
3. How to deploy a web application using GitLab

Clients and Servers



Layers of Client–Server Communication

- Internet connection
- TCP/IP (Transmission Control Protocol and Internet Protocol)
- HTTP (Hypertext Transfer Protocol)
  - GET: Requesting data from the server
  - POST: Sending data to the server

Components of a Webpage

The server sends various files to the client. For example:

- Code files: HTML, CSS, or JavaScript
- Data files: JSON or XML
- Assets: Other files such as images, audio, video, or PDFs

Components of a Webpage

The server sends various files to the client. For example:

- Code files: HTML, CSS, or JavaScript
- Data files: JSON or XML
- Assets: Other files such as images, audio, video, or PDFs

Dynamic webpages: The server may generate those files using a computer program, using a language such as PHP, Perl, Python, Java, .NET, * (CGI)

Synchronous and asynchronous requests

Synchronous: Initial loading of a webpage

Asynchronous: Requests performed as a reaction to user input without reloading the page

Synchronous and asynchronous requests

Synchronous: Initial loading of a webpage

Asynchronous: Requests performed as a reaction to user input without re-loading the page

Example: Loading the search bar vs. retrieving query autocompletions

Web Development Tools

Web Development Tools (DevTools): A set of inspection tools built into a browser. Used to examine, edit, and debug a web application.

- Firefox – Firefox Developer Tools
- Google Chrome – Chrome Developer Tools
- Internet Explorer and Microsoft Edge – F12 Web Developer Tools
- Safari – Safari Web Development Tools

Demo

[Demo: Inspecting a web application using DevTools]

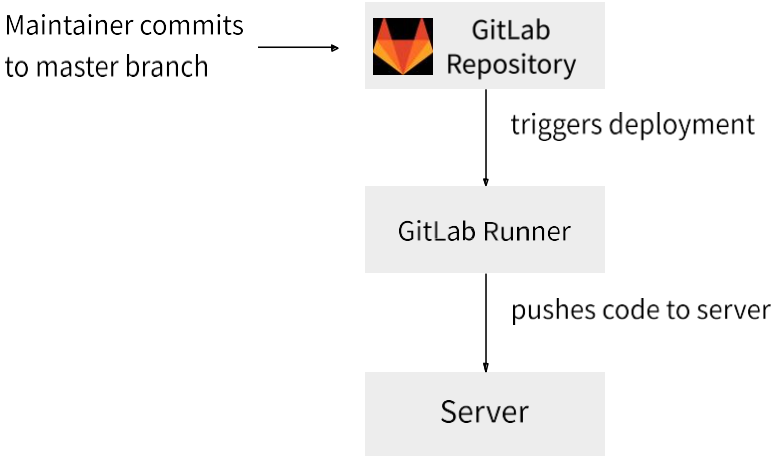
Topics

1. Organization
2. What is a web application?
3. How to deploy a web application using GitLab

Code Repository

- The source files of a web application often reside in a version-controlled repository.
- We will use https://gitlab.uzh.ch/.

Deployment via GitLab



Accessing the Web Application

- The web applications created in this class are only accessible within the UZH network (Eduroam / VPN). This is for security reasons.
- As a consequence, the application does not have a standard URL, but an IP address and a port number (e.g. http://172.23.49.21:8000/)
  - If your website cannot be reached, always check first if you are really inside the UZH network.

Demo

[Demo: Deploying a web application via GitLab]

TODO: Exercise 0 (Technical Setup)

- Available on OLAT until Friday
- Questions or technical difficulties? Feel free to ask in the Tutorial on Friday

TODO: Project Ideas

- Think about your individual project preferences for the next two weeks
- Some suggestions will be provided, but personal ideas are preferred
- The tutors are happy to advise you

TODO: Recommended Reading for Next Week

Introduction to HTML
(https://developer.mozilla.org/en-US/docs/Learn/HTML/Introduction_to_HTML)

CSS first steps
(https://developer.mozilla.org/en-US/docs/Learn/CSS/First_steps)