



OST

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Hangman

DS1 Challenge Task Presentation

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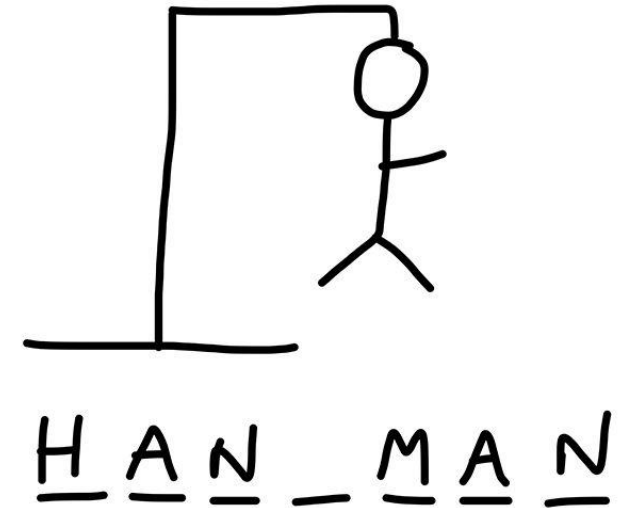
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OST, Rapperswil-Jona, Informatik

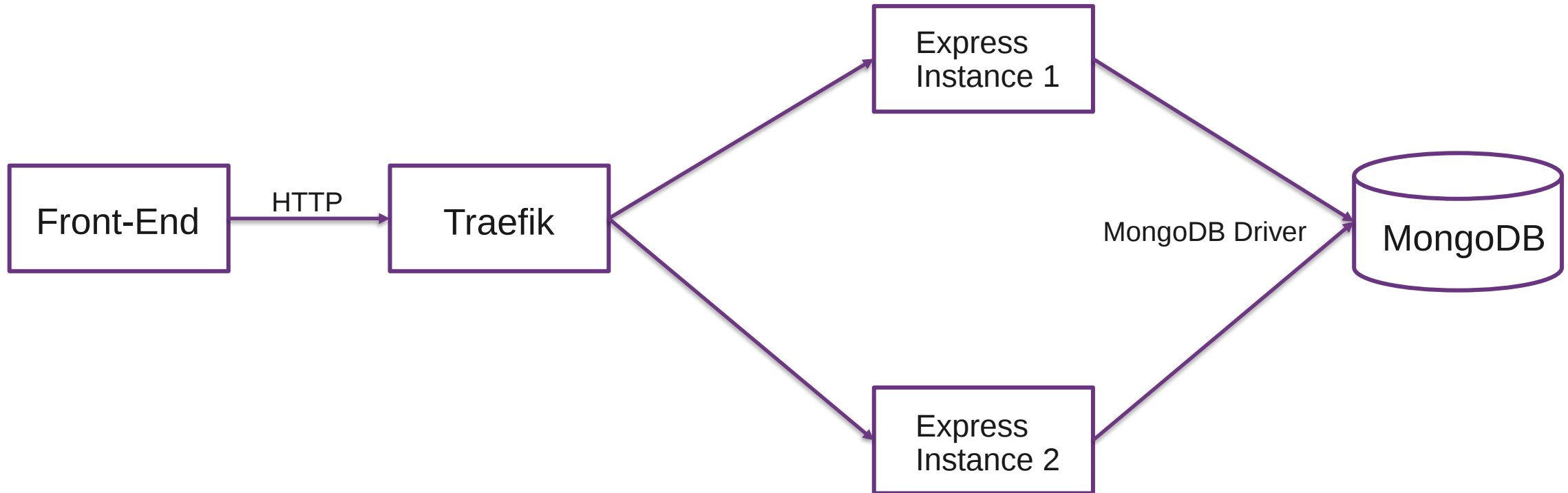
Idea

Idea

- Implementation of the game Hangman
- User receives a point for successfully finding a word
- 7 misguesses per round
- Ranking lists best users



Architecture



Architecture

Front-End

- Static pages are server side rendered
- Templates with Handlebars

Hangman

username
password
login
register

Hangman Home Ranking Logout

Home

Hi user!



You saved Bob 0 times!

Play

by Joel Hirszel und Jonas Knapp for the Challenge Task R081

Hangman Home Ranking Logout

Ranking

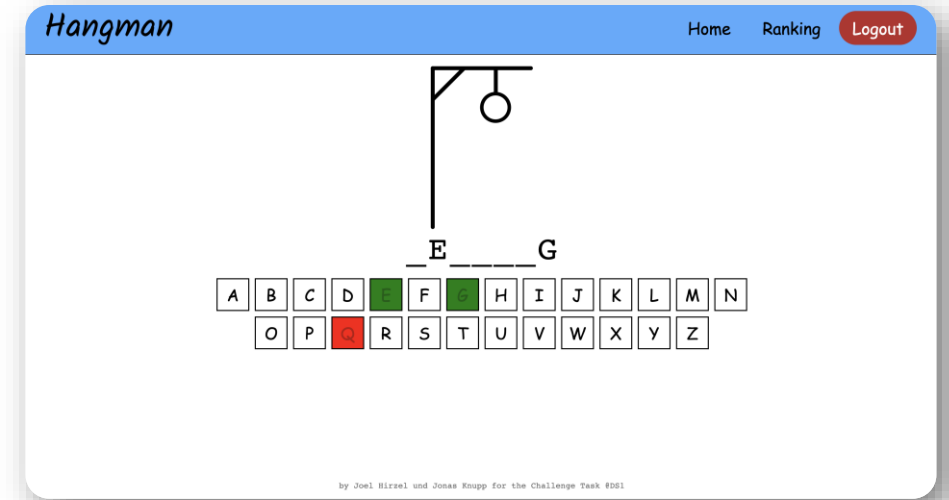
Username	Score
joel	0
user	0
bla	0
test	0
ui	0

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Architecture

Front-End

- Game page behaves like a single page application
 - Content is loaded dynamically with API calls
 - No page reload – DOM manipulation with client-side Javascript
 - Structure
 - GameController
 - GameService
 - HTTPService
 - Utils
- JWT is stored as http-only cookie



```
//gameController.ts
async function render() {
  const gameState = await gameService.getGame(gameId);
  paintGuessedCharacters(gameState.correctlyGuessedCharacters);
  paintWrongCharacters(gameState.wronglyGuessedCharacters);
  paintImage(gameState.wronglyGuessedCharacters.length);
}
```

Express Instances

- Structure
 - Routes
 - RouteController
 - GameStateStore
 - PlayerStore
 - WordStore
 - WordService
 - Authentication_Middleware

```
import jwt from "jsonwebtoken";

function authentication_middleware(req, res, next) {
  let token = req.cookies.jwt_token;
  try {
    let decoded = jwt.verify(token, process.env.SECRET);
    req.player_id = decoded.player_id;
    next();
  } catch (err) {
    res.redirect("/login");
  }
}
```

Architecture

MongoDB

- Three collections
 - Gamestates
 - Players
 - Words
- Words are loaded into the database with an initialization script

Player

```
_id: ObjectId("608a3f8f87cf842b94e49fe4")
username: "fredi"
score: 0
passwordHash: "10a690b3e4292d4689694857a45edf66b0028e99526d654b09b87021785bb83633d96a..."
```

Word

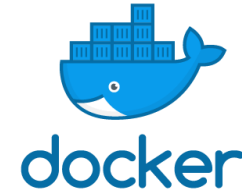
```
_id: ObjectId("6076cc127eccaff700d418be")
word: "Armour"
```

Gamestate

```
_id: ObjectId("6089208ebe073ba586717446")
wordToGuess: "accountability"
✓ correctlyGuessedCharacters: Array
  ✓ 0: Object
    char: "o"
    ✓ positions: Array
      0: 3
      > 1: Object
      > 2: Object
      > 3: Object
      > 4: Object
      > 5: Object
      > 6: Object
  ✓ wronglyGuessedCharacters: Array
    0: "f"
    1: "e"
    2: "s"
    3: "m"
    4: "h"
    5: "d"
    6: "r"
state: "lost"
gameOwnerId: "60892081be073b4995717445"
```

Libraries/Frameworks

- Node
- Typescript
- Express
- Handlebars
- MongoDB
- Traefik
- Docker
- jsonwebtoken
- crypto-js



Requirements fulfilled

Requirements fulfilled

Requirement	Fulfilments
Load balancing	✓ Traefik
Scalable service	✓ Express instances are completely stateless
JWT authentication	✓ Using jsonwebtoken library
Dockerized	✓ All services are dockerized
Use latest stable releases of all chosen libraries and frameworks	✓

Demonstration

