Assignment of bachelor's thesis

Title:	Cluster infrastructure for LearnShell
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Study program:	Informatics
Branch / specialization:	Web and Software Engineering, specialization Web Engineering
Department:	Department of Software Engineering
Validity:	until the end of summer semester 2022/2023

Instructions

LearnShell is a modular system for managing and performing exams with programming assignments in scripting languages, especially Shell. LearnShell currently runs on a simple infrastructure with 2 servers and a number of Docker containers running inside. Scaling, load-balancing, and reporting in the current infrastructure are inefficient.

1. Analyze the current infrastructure architecture and propose improvements for container orchestration.
2. Compare Docker Swarm and Kubernetes platforms in general and their suitability for orchestrating LearnShell containers.
3. Implement basic orchestration routines for LearnShell containers.
4. Configure GitLab CI for deploying some of the modules automatically.
5. Make sure you document your code.

Electronically approved by Ing. Jaroslav Kuchař, Ph.D. on 10 February 2021 in Prague.