CODE University of Applied Sciences Berlin

Self-assessment essay

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SE_06 NoSQL Databases

Spring semester 2024

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The aim of this essay is to reflect on the knowledge I acquired during this semester when it comes to NoSQL Databases.

The reason I decided to take this module is that I consider databases to be an extremely important area of knowledge when it comes to software engineering that cannot be overlooked in the process of learning. This semester I focused on building a full-stack blog website using MongoDB and Express, although I initially intended to use PostgreSQL as I wanted to pass the SQL Databases module. The reason for switching was that when the time came to implement a database into my project, I quickly realized that MongoDB would be a better choice due to its flexibility and its straightforward setup and configuration. Therefore, even though my initial plans were to get assessed in relational databases as that was the LU's main focus, I feel quite satisfied that I managed to gain some amount of practical and theoretical knowledge in both of these areas throughout the course of a single semester.

Looking back on everything learned so far, I feel confident that I have grasped an adequate understanding of selecting, configuring and using a database according to the needs of my project, as well as interacting with a database by using an Object-Document-Mapper(ODM). Some of the areas where I recognize the need for further learning is conducting a query performance analysis that allows me to get as much out of it as possible, as well as sharding and resilience due to the fact that I have not yet had a lot of experience with these concepts. However, despite not mastering these notions, I have managed to build every part of my project that I set out to accomplish and I am satisfied with my current level of expertise, as I feel as though I have a good foundational layer of knowledge.

Throughout the LU course, I did not have a difficult time following along I was already somewhat familiar with a lot of the concepts surrounding relational databases from my prior education. Regardless, I found the sessions to be quite engaging and interesting, especially when I was needed to get hands-on experience on developing a business model and think about its implications, such as in the Designathon. However, there were some "chapters" that I was completely new to, such as NoSQL databases. Initially, I had no idea what that meant and I could never bring myself to imagine that data could be stored in such different and creative ways, and that some projects even require several database types in order to efficiently function. This is also part of the reason why I decided to change modules, as I had no idea that a database managing system such as MongoDB could be so intuitive and much easier to work with than a traditional one, such as PostgreSQL. As my website is created using JavaScript, I used the Mongoose ODM in order to define schemas, models and queries and I feel that worked out great for me. I was able to quickly understand the underlying concepts and the syntax required in order to not only build my website's functionality but also take advantage of its great flexibility and make significant changes along the way with a minimal amount of effort.

All in all, when it comes to the process of implementing a database, my development process went quite smoothly. I started out by creating a prototype for the business model that consisted of only two entities, respectively one for the users and one for the posts, after which I created the two models using Mongoose. One of the first important decisions that I had to make was whether I should use embedding or referencing in order to link the authors to their posts. After researching the benefits and tradeoffs, I decided to choose embedding, as it would simplify my queries and lead to improved performance. However, later on I decided that I would like to add a commenting system to the features of my website, and that required me to choose between embedding the comments into the posts (which could significantly increase the size of the post documents) or creating a separate model that would reference the post in question and embed the

user's username. Ultimately, I feel that this decision-making process was a valuable experience when it comes to developing my skills in database design.

When it comes to the learning resources used, I mainly relied on the LU slides and personal notes, as well as a combination of YouTube videos and MongoDB documentation. Usually, my studying process would start by reviewing the slides and researching any new or interesting concept, followed by writing it down in my personal notes. Then, if I still felt like I did not yet have a clear enough view or understanding, I would watch related educational content on YouTube. When debugging my code, the MongoDB documentation worked wonders, as I found it very easy to understand and almost always seemed to have a designated page explaining how I should build what I wanted to build and how some features worked together. I did not engage in peer learning or any workshops outside of CODE, as I generally prefer and have a better outcome learning on my own and at my own pace.

As mentioned previously, I currently feel like I have a good foundation of understanding how to design and work with a database. Of course, I do have some knowledge gaps due to the lack of experience in these areas, such as creating a backup plan, scaling and security that I definitely plan on filling while working on either this project or future projects. When it comes to the qualification goals, I believe that I meet most of them (with the exception of those mentioned above) and I assess my knowledge to be at around Level 1, which I am aiming to achieve this semester for this module.