COMP1531

📚 Full-Stack - Persistence

Lecture 5.1

Author(s): Hayden Smith

(Download as PDF)

In This Lecture

- **Why?** 🤔
  - Data is a critical part of nearly every software system, so let's understand its interactions

- **What?** 📰
  - Data
  - Persistence

💿 Data

Data: Facts that can be recorded and have implicit meaning

From **data (raw)** we can find **insights (information)** that allow us to make decisions.

💿 Data

Data is also critical to allow an application to function - as it allows for the storage of state.

Data (and "big data") are becoming huge topics in the world of computing and mathematics. This course does not address these topics.

👨🏼‍💻 Data In Applications

Data is part of every software application (e.g. variables).

However, often when we refer to "Data" in software we're referring to a "Data Layer" - a part of the software that is focused solely on storing data and maintaining a state for longer term.

Let's take a close look at the data layer.

💼 Data Layers ("Databases")

Database: A word used to describe a store of data. Databases are typically what a data layer consists of.

There are 3 main ways to store data:

1. In-memory (non-persistent)
2. In-file (filesystem direct storage)
3. In-database (Relational SQL, NoSQL)

As you move down the list, barrier to entry becomes higher, but so does performance.

To learn more about relational SQL, study COMP3311.

🔑 Data Layers ("Databases")

But don't all applications store data? E.G. Variables? Memory? Registers? Something?

🔐 Data Layers ("Databases")

But don't all applications store data? E.G. Variables? Memory? Registers? Something?

Yes! But we're talking about a much longer type of data storage...

🛅 Storing Data: Persistence

Persistence: When program state outlives the process that created it. This is achieved by storing the state as data in computer data storage.

Persistence can be interpreted very broadly, though in this course we will define it as storing data to disk.

🔐 Storing Data: Persistence

Can we modify our project server to persistently store data?

How would we do that?

🌸 Adding Persistence To The Project

For the project, we require you as part of iteration 2 to add a persistence layer.

Rather than ask you to add something complicated like an SQL database, we're simply asking you to use a simple in-file database.

All this needs to consist of is loading and storing the state of your program in a JSON string that is stored on file.

🌸 Adding Persistence To The Project

To do this, we can simply use our code samples from an earlier week lecture on JSON.

But when do you load & save this data?

🌸 Adding Persistence To The Project

To do this, we can simply use our code samples from an earlier week lecture on JSON.

But when do you load & save this data?

- Load: On server start, open the JSON file and set the global variable to be the parsed JSON object

🌸 Adding Persistence To The Project

To do this, we can simply use our code samples from an earlier week lecture on JSON.

But when do you load & save this data?

- Load: On server start, open the JSON file and set the global variable to be the parsed JSON object
- Save: Either based on a timer, or at the end of every route call, JSON stringify your global variable and store in a file

👂 **Feedback**

Or go to the form here.