Serialization for the Parking System -Application: Client/Server

for

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Information Technology

Peter Fedor

University of Denver College of Professional Studies

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Faculty: Nathan Braun, MS

Director: Cathie Wilson, MS

Dean: Michael J. McGuire, MLS

Introduction

For this assignment, I was tasked with designing and adding a client server application that allowed the overall application to communicate with JSON. The main classes created were the Server.java, ServerClient.java, ParkingRequest.java, and ParkingResponse.java classes. Within the request and response classes, I did implement the use of GSON to assist with the serialization and deserialization of the JSON.

Design

The design of the client/server set up was simple. I ended up needing to create the four classes mentioned above. First, the Server.java class listens for connections on port 8000. Any JSON requests that come to it are deserialized and sent to the parking request class for processing, then creating a parking response. The parking response is then serialized and sent back to the client. The server client works to parse the commands received, constructing the parking requests, serializing them, and sending them back to the server. Then it receives the response from the server, deserializing it, and prints out the response. The other two classes are less complex. The parking request class simply gets the parameters from the commands and provides methods for JSON serialization. The parking response acts similarly but also gives the status code and the message.

Challenges and Problem Solving

This assignment was quite challenging. Most of my experience is in Python with Flask servers, not serializing Java data into JSON. So, there was a pretty decent learning curve. First, I was trying to get my GitHub Repository to communicate properly with my IDE (Eclipse). This took a great deal of time, and I don't think I have that fully fixed yet. However, I was able to update my local repository with my remote repository. From there I was able to open the project file and work with the commands again through Eclipse. Some stuff did break, and I did have to re-install Junit, Maven, as well as the GSON library. My next struggle was getting the path convention correct for the commands. Since I have multiple drives on my computer, and

have a different build path than the assignment, I had to figure out the correct syntax and directory to call commands from within eclipse. This took me a bit of time, and was quite frustrating, however, I was able to get the correct paths and run both the server and the server client without any issues. Finally, I am new to using GSON and even JSON within Java. I have some experience using JSON, but again, that was all in Python. So having to learn GSON and how JSON interacts with Java was new to me. I did find a few good resources to help me out with that. Overall, as difficult as this assignment was, I did have a little bit of fun figuring it out.

Conclusion

Overall, this assignment was very difficult. But at the end of it, I was able to create a server that uses a consistent response protocol. The other code shows a response code, allowing the person to run the code to know if it was run correctly. These concepts can be very useful when looking at applications, especially the parking lot application. The assignment gave me a better view on the uses of serialization. Some areas I would have liked to dive deeper into are security when transmitting serialized data. Since the system deals with payment information and personal identifiable information, I believe the security aspect should be addressed. Though we did not transmit anything sensitive, the overall concept remains a little bit blurry to me. There is also room to expand on the topic such as refining data structures to provide better error handling within the code. This concept has been challenging, but very interesting to me. Serialization can be easily changed to allow for greater scalability within a program and is a valuable tool for any Java programmer to know.

References

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