Applied research

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Version History

Version	Date	Author(s)	Changes	State
1	2022-10-07	Lucas Jacobs	Topic, main and sub-questions, method describing and first research answers on first and second sub-question	In progress

Contents

Problem description

Within this document, I am going to research an annotation in the framework called Spring Boot. This annotation is called '@Autowire'. Spring Boot is a framework that you can use in the code language Java. To do this research, I do not have enough detailed information about the Spring Boot framework in relation to the @Autowire.

Main question

How does @Autowire actually work in Spring Boot?

Why is the assignment in the section chosen a topic: Spring boot: how does @autowire actually work? As a topic, I think it is more of the main question with a problem I do not have enough information about the spring boot framework in relation to the autowire.

Sub questions

1. What kind of function can you do with @Autowire that makes it so that people want to use the annotation?
2. Has @Autowire actually benefits compared to the standard way of implementing dependency injection in Java? If so, what?
3. How can you implement the annotation @Autowire in your code?
4. Where is it logical to apply the annotation @Autowire in your code?
5. What kind of logic is behind the annotation @Autowire so that it makes it possible to use dependency injection within Java?

Methods to answer the sub-questions

Sub-question 1

For this question, I want to use field research. This is because the question is about exploring the application context. With this question, I will get a more in-depth knowledge of why persons are using the annotation @Autowire.
To continue, the first method that I am going to use is problem analysis. This is because you need to know for instance 'Why is this function satisfied for the user?'. By asking this kind of question you will get a better understanding of the actual answer to the sub-question. Furthermore, I want to use the method called observation. With this method, I will get a more clear view of how people are going to use this annotation. (ictresearchmethods, 2019)

Sub-question 2

With this question, I, first of all, want to use community research. With this research, I can tackle the problem by seeing what other people think of the @autowire annotation. I can go to online communities like Stack Overflow. By combining the knowledge I have gained from it I can conclude if there will be actual benefits.
To continue, I also want to use a literature study for this question. I first need to find general information before I can conclude for myself if @autowire has some benefits. (ictresearchmethods, 2019)

Sub-question 3

To this question, I want to apply the method 'Best good and bad practices. This is mainly because I want to figure out how other people have implemented the annotation @autowire. So to conclude, this is also better to understand if some people struggled to implement @autowire, or if the implementation is fairly simple. Also, I want to use the 'Problem analysis, this is because I need to know the basic question such as who, what, why, when, where, and how. (ictresearchmethods, 2019)

Sub-question 4

As for this question I again want to use the 'Community research' method. The reason for this is that the answer can be different for each person or maybe just the same. As for sub-question, 2 where I will for the biggest part use the website Stack Overflow, I also will use other websites where people also express their logical thinking.
Furthermore, the 'Available product analysis' will be used because I can figure out if there are already existing solutions to this question. (ictresearchmethods, 2019)

Sub-question 5

To begin with the first method, I will again use the 'Literature study'. The biggest reason for this is that I need get in-depth information about the annotation. When I am done with this method and I have written a summary of my findings then I can continue with the method 'Task analysis. This way I will get an understanding of the actual task that @autowire is performing. (ictresearchmethods, 2019)

Answers sub-questions

Sub-question 1

Problem analysis

First of all, let's start by asking what can be accomplished by using @autowired. @autowired is a feature of the Spring Boot framework. The annotation will be used to enable us to inject the dependency object naturally (Educba,). In other words, @autowired will say ‘can you give me an instance of this class?’. Compared to the @Bean where you will use to keep hold of an instance of a class and you can ask for it when to pass it back. (Stack Overflow, 2015)
To continue, where can @autowire be used? There are multiple ways of implementing autowiring in your code. The following are:

- Nothing: this is the default autowiring mode. It just means that there is no autowiring.
- byName: In this mode ‘byName’ inject the object dependency by the name of the bean. In this case, the property and bean name needs to be the same.
- byType: this is the same as a name but it injects the object dependency according to type. This way, it can have a different bean and property name.
- Constructor: Autowiring with a constructor is similar to ‘byType’ but then it is for constructors’ arguments.
- Autwiring with autodetect: this will automatically try to autowire by the constructor, but when it fails it will try to autwire it byType.

(DZone,)
Next, an important thing to ask is, why is this function @autowired satisfied for the users?

Observation

Sub-question 2

Literature study

Findings

To begin with, it is beneficial for writing less code. When you are using the annotation, you will write less code for the reason that you do not need to write code to inject the dependency explicitly. Therefore people will use this framework because it will reduce developing time since you do not need to specify the properties and constructor arguments by yourself. (DZone,)

On the other hand, there are also some disadvantages of autowiring. Autowiring is less precise than explicit wiring. Spring tries to avoid double meaning by not explicitly stating the relationships between objects. Also, when you want to document your code, tools will maybe not support a spring container.

Autowiring in Spring Boot also has its limitations to it. These are the following:

- When there are a lot of dependencies in a program, it is hard to find using the autowire attribute of a bean.
- You cannot autowire primitive data types and strings. It only works with references.
- Overriding is possible. When you define a dependency using a property or constructor-args tag, it will always override.

(DZone)

Conclusion of findings of the literature study

To conclude this part, when you do not have the time for writing your dependencies or you are fine with the pro and cons, you can use @autowire. But when you have the time it is maybe worth making it by yourself because when you want to implement certain things that you can not do because of the limitations of Spring Boot autowiring you should do it.

Community Research

I, first of all, found something on Stack Overflow which was quite interesting. It was called ‘What exactly is Field Injection and how to avoid it?’(Stack Overflow, 2020).

References

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