Spring Boot Interview Questions and Answers

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Spring Boot is a Java-based framework used to develop stand-alone, production-ready applications with minimal configuration. Introduced by Pivotal in 2014, it simplifies the development of Spring applications by offering embedded servers, auto-configuration, and fast startup. Many top companies, including Accenture, Netflix, Amazon, and Google, rely on it for its performance and ease of development.

In this guide, we provide comprehensive **Spring Boot interview questions** for both freshers and experienced developers. It covers essential topics such as Core Spring concepts, REST APIs, microservices, auto-configuration, embedded servers, monitoring, and error handling, helping you prepare for any Spring Interview Questions with confidence.

Spring Boot Interview Questions for Freshers

1. What is Spring Boot?

Spring Boot is built on top of the Spring framework to create stand-alone RESTful web applications with very minimal configuration and there is no need of external servers to run the application because it has embedded servers like Tomcat and Jetty etc.

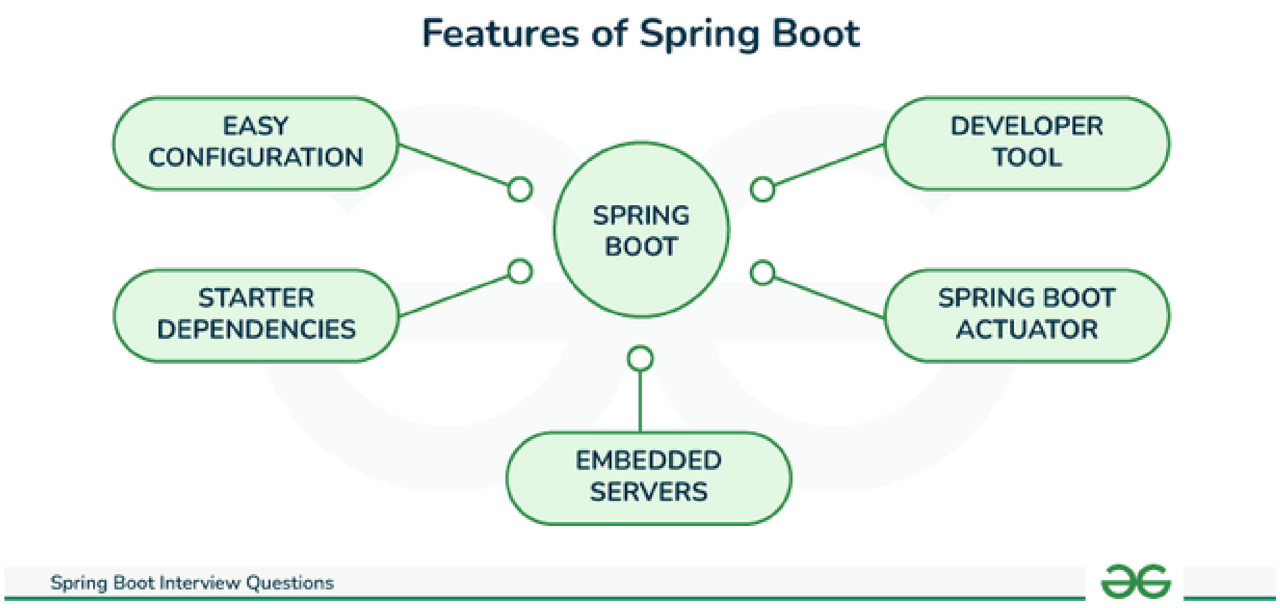
- Spring Boot framework is independent.
- It creates executable spring applications that are production-grade.

To know more about Spring Boot, refer to this article – Introduction to Spring Boot

2. What are the Features of Spring Boot?

There are many useful features of Spring Boot. Some of them are mentioned below:

- **Auto-configuration -** Spring Boot automatically configures dependencies by using **@EnableAutoconfiguration** annotation and reduces boilerplate code.
- **Spring Boot Starter POM** - These Starter POMs are pre-configured dependencies for functions like database, security, maven configuration etc.
- **Spring Boot CLI (Command Line Interface)** - This command line tool is generally for managing dependencies, creating projects and running the applications.
- **Actuator -** Spring Boot Actuator provides health check, metrics and monitors the endpoints of the application. It also simplifies the troubleshooting management.
- **Embedded Servers -** Spring Boot contains embedded servers like Tomcat and Jetty for quick application run. No need of external servers.



3. What are the advantages of using Spring Boot?

Spring Boot is a framework that creates stand-alone, production grade Spring based applications. So, this framework has so many advantages.

- **Easy to use:** The majority of the boilerplate code required to create a Spring application is reduced by Spring Boot.
- **Rapid Development:** Spring Boot's opinionated approach and auto-configuration enable developers to quickly develop apps without the need for time-consuming setup, cutting down on development time.
- **Scalable:** Spring Boot apps are intended to be scalable. This implies they may be simply scaled up or down to match your application's needs.
- **Production-ready:** Metrics, health checks, and externalized configuration are just a few of the features that Spring Boot includes and are designed for use in production environments.

4. Define the Key Components of Spring Boot.

The key components of Spring Boot are listed below:

- Spring Boot starters
- Auto-configuration
- Spring Boot Actuator
- Spring Boot CLI
- Embedded Servers

5. Why do we prefer Spring Boot over Spring?

Here is a table that summarizes why we use Spring Boot over Spring framework.

Feature	Spring	Spring Boot

Feature	**Spring**	**Spring Boot**
Ease of use	More complex	Easier
Production readiness	Less production-ready	More production-ready
Scalability	Less scalable	More scalable
Speed	Slower	Faster
Customization	Less Customizable	More Customizable

To know more, refer to the article – Difference between Spring and Spring Boot

6. Explain the internal working of Spring Boot.

Here are the main steps involved in how Spring Boot works:

- Start by creating a new Spring Boot project.
- Add the necessary dependencies to your project.
- Annotate the application with the appropriate annotations.
- Run the application.

To know more about internal working of spring boot application, refer to this article – How Spring Boot Application works Internally?

7. What are the Spring Boot Starter Dependencies?

Spring Boot provides many starter dependencies. Some of them which are used the most in the Spring Boot application are listed below:

- Data JPA starter
- Web starter
- Security starter
- Test Starter
- Thymeleaf starter

8. How does a spring application get started?

A Spring application gets started by calling the **main()** method with **@SpringBootApplication** annotation in the **SpringApplication** class. This method takes a SpringApplicationBuilder object as a parameter, which is used to configure the application.

- Once the SpringApplication object is created, the **run()** method is called.

- Once the application context is initialized, the run() method starts the application's embedded web server.

Example:

```
importorg.springframework.boot.SpringApplication;
importorg.springframework.boot.autoconfigure.SpringBootApplication;
@SpringBootApplication
publicclass MyApplication
{
publicstaticvoidmain(String[]args){
SpringApplication.run(MyApplication.class,args);
}
}
```

9. What does the @SpringBootApplication annotation do internally?

The **@SpringBootApplication** annotation combines three annotations. Those three annotations are: **@Configuration, @EnableAutoConfiguration,** and **@ComponentScan** .

- **@AutoConfiguration** : This annotation automatically configuring beans in the class path and automatically scans the dependencies according to the application need.
- **@ComponentScan** : This annotation scans the components (@Component, @Service, etc.) in the package of annotated class and its sub-packages.
- **@Configuration:** This annotation configures the beans and packages in the class path.

@SpringBootApplication automatically configures the application based on the dependencies added during project creation and bootstraps the application by using run() method inside the main class of an application.

> @SpringBootApplication = @Configuration + @EnableAutoConfiguration + @ComponentScan

10. What is Spring Initializr?

Spring Initializer is a tool that helps us to create skeleton of spring boot project or project structure by providing a maven or gradle file to build the application. It set up the framework from scratch.

11. What are Spring Boot CLI and the most used CLI commands?

Spring Boot CLI is a command-line tool that can be used to **create, run,** and **manage** Spring Boot applications. It is a powerful tool that can help us to get started with Spring Boot quickly and easily. It is built on top of the Groovy programming language.

Most used **CLI commands** are:

- -run
- -test

- -jar
- -war
- --init
- -help

Spring Boot Intermediate Interview Questions

12. What are the basic Spring Boot Annotations?

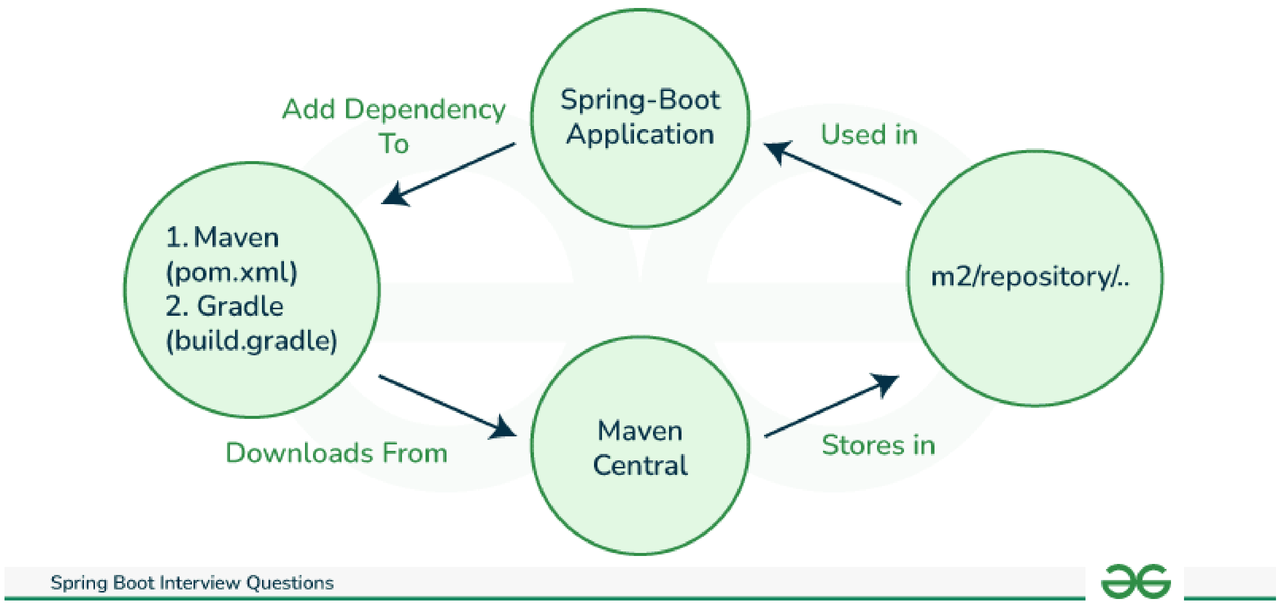
- **@SpringBootApplication:** This is the main annotation used to bootstrap a Spring Boot application. It combines three annotations: **@Configuration** , **@EnableAutoConfiguration** , and **@ComponentScan** . It is typically placed on the main class of the application.
- **@Configuration:** This annotation is used to indicate that a class contains configuration methods for the application context. It is typically used in combination with @Bean annotations to define beans and their dependencies.
- **@Component:** This annotation is the most generic annotation for any Spring-managed component. It is used to mark a class as a Spring bean that will be managed by the Spring container.
- **@RestController:** This annotation is used to define a RESTful web service controller. It is a specialized version of the @Controller annotation that includes the @ResponseBody annotation by default.
- **@RequestMapping:** This annotation is used to map HTTP requests to a specific method in a controller. It can be applied at the class level to define a base URL for all methods in the class, or at the method level to specify a specific URL mapping.

To know more about Spring Boot Annotations, refer to this article – Spring Boot - Annotations

13. What is Spring Boot dependency management?

Spring Boot dependency management makes it easier to manage dependencies in a Spring Boot project. It makes sure that all necessary dependencies are appropriate for the current Spring Boot version and are compatible with it.

> To create a web application, we can add the S **pring Boot starter web dependency** to our application.



To know more about Spring Boot Dependency Management, refer to this article – [Spring Boot - Dependency Management]()

14. Is it possible to change the port of the embedded Tomcat server in Spring Boot?

Yes, it is possible to change the port of the embedded Tomcat server in a Spring Boot application.

The simple way is to set the **server. port** property in your application's **application.properties** file. For example, to set the port to 8081, add the following property to the application.properties file:

```
server.port=8081
```

15. What is the starter dependency of the Spring boot module?

Spring Boot Starters are a collection of pre-configured maven dependencies that makes it easier to develop particular types of applications. These starters include,

- Dependencies
- Version control
- Configuration needed to make certain features.

To use a **Spring Boot starter dependency** , we simply need to add it to our project's **pom.xml** file. For example, to add the Spring Boot starter web dependency, add the following dependency to the pom.xml file:

```
<dependency>
      <groupId>org.springframework.boot</groupId>
      <artifactId>spring-boot-starter-web</artifactId>
</dependency>
```

To know more about Spring Boot Starters, refer to this article – [Spring Boot - Starters]

16. What is the default port of Tomcat in spring boot?

The default port of the embedded Tomcat server in Spring Boot is **8080** . We can change the default port by setting the **server.port** property in your application's **application.properties** file.

17. Can we disable the default web server in the Spring Boot application?

Yes, we can disable the default web server in the Spring Boot application. To do this, we need to set the **server.port** property to "-1" in the application's **application.properties** file.

18. How to disable a specific auto-configuration class?

To disable a specific auto-configuration class in a Spring Boot application, we can use the **@EnableAutoConfiguration** annotation with the " **exclude"** attribute.

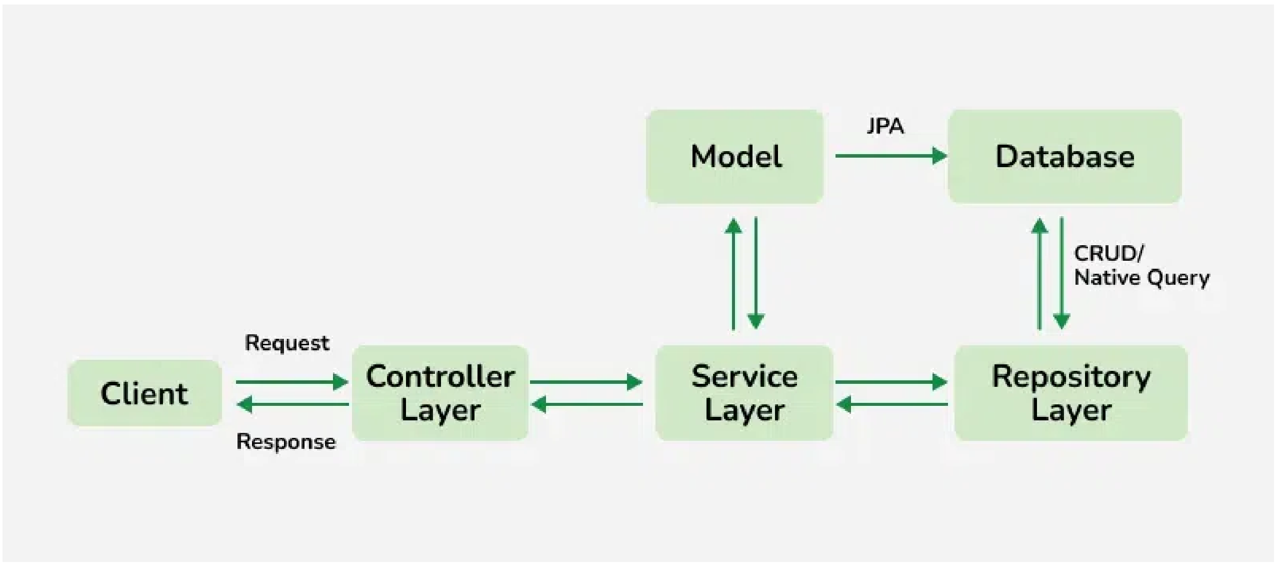
```
@EnableAutoConfiguration(exclude = {//classname})
```

19. Can we create a non-web application in Spring Boot?

Yes, we can create a non-web application in Spring Boot. Spring Boot is not just for web applications. Using Spring Boot, we can create applications like Microservices, Console applications, and batch applications.

20. Describe the flow of HTTPS requests through the Spring Boot application.

The flow of HTTPS requests through a Spring Boot application is as follows:



- First client makes an **HTTP request** (**GET, POST, PUT, DELETE**) to the browser.

- After that the request will go to the controller, where all the requests will be mapped and handled.
- After this in Service layer, all the **business logic** will be performed. It performs the business logic on the data that is mapped to **JPA (Java Persistence API)** using model classes.
- In repository layer, all the **CRUD** operations are being done for the **REST APIs** .
- A **JSP page** is returned to the end users if no errors are there.

21. Explain @RestController annotation in Spring Boot.

@RestController annotation is like a shortcut to building RESTful services. It combines two annotations:

- **@Controller** : Marks the class as a request handler in the Spring MVC framework.
- **@ResponseBody** : Tells Spring to convert method return values (objects, data) directly into HTTP responses instead of rendering views.

It enables us to Define endpoints for different **HTTP methods (GET, POST, PUT, DELETE),** return data in various formats (JSON, XML, etc.) and map the request parameters to method arguments.

22. Difference between @Controller and @RestController

Features	**@Controller**	**@RestController**
Usage	It marks a class as a controller class.	It combines two annotations i.e. @Controller and @ResponseBody.
Application	Used for Web applications.	Used for RESTful APIs.
Request handling and Mapping	Used with @RequestMapping annotation to map HTTP requests with methods.	Used to handle requests like GET, PUT, POST, and DELETE.

> Note: Both annotations handle requests, but @RestController prioritizes data responses for building API.

23. What is the difference between RequestMapping and GetMapping?

Features	**@RequestMapping**	**@GetMapping**
Annotations	@RequestMapping	@GetMapping

Features	@RequestMapping	@GetMapping
Purpose	Handles various types of HTTP requests (GET, POST, etc.)	Specifically handles HTTP GET requests.
Example	@RequestMapping(value = "/example", method = RequestMethod.GET)	@GetMapping("/example")

24. What are the differences between @SpringBootApplication and @EnableAutoConfiguration annotation?

Features	@SpringBootApplication	@EnableAutoConfiguration
When to use	When we want to use auto-configuration	When we want to customize auto-configuration
Entry point	Typically used on the main class of a Spring Boot application, serving as the entry point.	Can be used on any configuration class or in conjunction with @SpringBootApplication.
Component Scanning	Includes **@ComponentScan** annotation to enable component scanning.	Does not perform component scanning by itself.
Example	@SpringBootApplication public class MyApplication { public static void main(String[] args) { SpringApplication.run(MyApplication.class, args); } }	@Configuration @EnableAutoConfiguration public class MyConfiguration { }

25. What are Profiles in Spring?

Spring Profiles are like different scenarios for the application depending on the environment.

- You define sets of configurations (like database URLs) for different situations (development, testing, production).
- Use the `@Profile` annotation to clarify which config belongs to where.
- Activate profiles with **environment variables** or **command-line** options.

To use Spring Profiles, we simply need to define the **spring.profiles.active** property to specify which profile we want to use.

26. Mention the differences between WAR and embedded containers.

Feature	WAR	Embedded containers
Packaging	Contains all of the files needed to deploy a web application to a web server.	It is a web application server included in the same JAR file as the application code.
Configuration	Requires external configuration files (e.g., web.xml, context.xml) to define the web application.	Uses configuration properties or annotations within the application code.
Security	Can be deployed to a web server that is configured with security features.	Can be made more secure by using security features that are provided by JRE.

Spring Boot Interview Questions For Experienced

27. What is Spring Boot Actuator?

Spring Boot Actuator is a component of the Spring Boot framework that provides production-ready operational monitoring and management capabilities. We can manage and monitor your Spring Boot application while it is running.

> Note: To use Spring Boot Actuator, we simply need to add the **spring-boot-starter-actuator** dependency to our project.

To know more about Actuator, refer to this article – Spring Boot Actuator

28. How to enable Actuator in the Spring boot application?

Below are the steps to enable actuator in Spring Boot Application:

- Add Actuator dependency.
- Enable endpoints in application.properties.
- Run your Spring Boot app.

Now we can access Actuator endpoints at URLs on the management port.

29. What is the purpose of using @ComponentScan in the class files?

@ComponentScan annotation is used to tell Spring to scan a package and automatically detect Spring components, configurations, and services to configure. The @ComponentScan annotation can be used in the following ways:

- **Without arguments**
- **With basePackageClasses**
- **With basePackages**

To know more about @ComponentScan annotation, refer to this article – Spring @ComponentScan Annotation with Example

30. What are the @RequestMapping and @RestController annotations in Spring Boot used for?

@RequestMapping: @RequestMapping is used to map HTTP requests to handler methods in your controller classes. It can be used at the class level and method level. It supports mapping by:

- HTTP method - GET, POST, PUT, DELETE
- URL path
- URL parameters
- Request headers

@RestController: @RestController is a convenience annotation that combines **@Controller** and **@ResponseBody** . It indicates a controller where every method returns a domain object instead of a view.

> @RestController = @Controller + @ResponseBody

31. How to get the list of all the beans in your Spring boot application?

- Using the **ApplicationContext** object in Spring Boot, we can retrieve a list of all the beans in our application.
- The ApplicationContext is responsible for managing the beans and their dependencies.

32. Can we check the environment properties in your Spring boot application explain how?

Yes, we can check the environment properties in our Spring Boot Application. The Environment object in a Spring Boot application can be used to check the environment's properties.

Configuration settings for the application, includes:

- property files
- command-line arguments
- environment variables

We can get the Environment instance by calling the **getEnvironment()** method.

33. How to enable debugging log in the spring boot application?

To enable debugging log in Spring Boot Application, follow the below steps:

- **Add the logging level property to application.properties.**
- **Configure the log pattern to include useful information.**

- **Run the Spring Boot application.**

Using the actuator endpoint, the log level can also be changed at runtime.

```
Curl -X POST \http://localhost:8080/actuator/loggers/<logger-name>
\ -H 'content-type: application/json' \-d '{"configuredLevel": "DEBUG"}'
```

34. What is dependency Injection and its types?

Dependency Injection (DI) is a design pattern that enables us to produce loosely coupled components. In DI, an object's ability to complete a task depends on another object. There three types of dependency Injections.

- **Constructor injection:** This is the most common type of DI in Spring Boot. In constructor injection, the dependency object is injected into the dependent object's constructor.
- **Setter injection:** In setter injection, the dependency object is injected into the dependent object's setter method.
- **Field injection** : In field injection, the dependency object is injected into the dependent object's field.

To know more about Dependency Injection, refer to the article –

35. What is an IOC container?

An **IoC (Inversion of Control)** Container in Spring Boot is essentially a central manager for the application objects that controls the creation, configuration, and management of dependency injection of objects (often referred to as beans), also referred to as a DI (Dependency Injection) container.

To know more about IOC Container, refer to the article – Spring - IoC Container

36. What is the difference between Constructor and Setter Injection?

Features	Constructor Injection	Setter Injection
Dependency	Dependencies are provided through constructor parameters.	Dependencies are set through setter methods after object creation.
Immutability	Promotes immutability as dependencies are set at creation.	Dependencies can be changed dynamically after object creation.
Dependency Overriding	Harder to override dependencies with different implementations.	Allows easier overriding of dependencies using different setter values.

Bonus Spring Boot Interview Questions and Answers

1. What is Thymeleaf?

Thymeleaf is a Java-based server-side **template engine** used in Java web applications to render dynamic web pages. It is a popular choice for server-side templating in the Spring ecosystem, including Spring Boot.

To know more about Thymeleaf, refer to this article - Spring Boot - Thymeleaf with Example

2. Explain Spring Data and What is Data JPA?

Spring Data is a powerful framework that can be used to develop data-oriented applications. It aims to simplify the development of data-centric applications by offering abstractions, utilities, and integration with various data sources.

> **Spring Data JPA:** This project provides support for accessing data from relational databases using JPA.

3. Explain Spring MVC

MVC stands for **Model, View,** and **Controller. Spring MVC** is a web MVC framework built on top of the Spring Framework. It provides a comprehensive programming model for building web applications.

4. What is Spring Bean?

An object that is managed by the Spring IoC container is referred to as a spring bean. A Spring bean can be any Java object.

5. What are Inner Beans in Spring?

An **Inner Bean** refers to a bean that is defined within the scope of another bean's definition. It is a way to declare a bean inside the configuration of another bean, without explicitly giving it a unique identifier.

To define an Inner Bean in Spring, we can declare it as a nested <bean> element within the configuration of the enclosing bean.

6. What is Bean Wiring?

Bean wiring is a mechanism in Spring that is used to manage the dependencies between beans. It allows Spring to inject collaborating beans into each other. There are two types of Bean Wiring:

- Autowiring
- Manual wiring

To know more about Autowiring, refer to the article – Spring - Autowiring

7. What Are Spring Boot DevTools Used For?

Spring Boot DevTools provides a number of development-time features and enhancements to increase developers' productivity and can be used for the following purposes:

- Automatic application restart
- Fast application startup:
- Actuator endpoints
- Additional development utilities

To know more about Spring Boot DevTools, refer to the article – Spring Boot - DevTools

8. What error do you see if H2 is not present in the class path?

Below is the error we see if H2 is not present in the class path:

```
java.lang.ClassNotFoundException: org.h2.Driver
```

9. Mention the steps to connect the Spring Boot application to a database using JDBC.

To connect an external database like MySQL or Oracle to a Spring Boot application using JDBC, we need to follow below steps:

- Add the dependency for the JDBC driver of the database.
- Create an application.properties file.
- Configure the database connection properties.
- Create a JdbcTemplate bean.
- Use the JdbcTemplate bean to execute SQL queries and statements.

To know more, refer to this article – Spring Boot - CRUD Operations using MySQL Database

10. Mention the advantages of the YAML file over than Properties file and the different ways to load the YAML file in Spring boot.

Advantages of YAML file over Properties file:

- Easy to edit and modify.
- Conciseness
- Supports Complex data types.

Different ways to load YAML file in Spring Boot:

- Using the @ConfigurationProperties annotation

- Using the YamlPropertiesFactoryBean class

11. What Do you understand about Spring Data Rest?

Spring Data REST is a framework that exposes Spring Data repositories as RESTful web services. It allows us to expose repositories as REST endpoints with minimal configuration by following Spring Data REST Technologies like **Spring Data** and **Spring MVC** .

To know more about Spring Data REST, Please Refer to this article- Spring - REST Controller

12. Why is Spring Data REST not recommended in real-world applications?

Here are the reasons why not to choose Spring Data REST:

- **Performance** - Performance may not be optimal for very large-scale applications.
- **Versioning** - It can be difficult to version the REST APIs exposed by Spring Data REST.
- **Relationships** - Handling relationships between entities can be tricky with Spring Data REST.
- **Filtering** - There are limited options for filtering the results returned by the endpoints.

13. How is Hibernate chosen as the default implementation for JPA without any configuration?

Spring Boot automatically configures **Hibernate** as the default JPA implementation when we add the **spring-boot-starter-data-jpa** dependency to our project. This dependency includes the Hibernate JAR file as well as the Spring Boot auto-configuration for JPA.

To know more about Hibernate and JPA, Refer to below articles:

14. Explain how to deploy to a different server with Spring Boot?

Below are the steps on how to deploy to a different server with Spring Boot:

- Step 1: **Build your Spring Boot application.**
- Step 2: **Create a deployment package.**
- Step 3: **Deploy the deployment package to the server.**
- Step 4: **Start the server.**