Microservices Interview preparation

SKILL LYNC

Spring

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- What is a Dependency?
- What is IOC (Inversion of Control)?
- What is Dependency Injection, Can you give few examples of Dependency Injection?
- What is Auto Wiring?
- What are Bean Factory and Application Context?

- How do you create an application context with Spring?
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Spring mvc

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Spring Boot and Spring Data Interview Questions

SKILL LYNC

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RESTful Web Services

- What is REST?
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- What is GetMapping and what are the related methods available in Spring MVC?

- What is the appropriate HTTP Response Status for successful execution of a Resource Creation?
- Why do we use ResponseEntity in a RESTful Service?
- How do you handle Validation Errors with RESTful Web Services?

- **What is Loose Coupling?**

```
Loose coupling is a software design principle that
aims to minimize dependencies between components in a
system, allowing them to operate independently and be
easily replaced or modified without affecting the rest
of the system.
```

- **What is a Dependency?**

```
In Spring, a dependency is a Java object that is
needed by a component to perform its function, and is
injected into the component using the Spring
dependency injection framework. Spring manages the
dependencies between the components of a Spring-based
application, allowing for loose coupling and easier
testing and maintenance of the code. Dependencies in
Spring are typically defined in a configuration file
or via annotations, and can be automatically injected
into components at runtime by Spring's dependency
injection mechanism.
```

- **What is Dependency Injection, Can you give few examples of Dependency Injection?**

```
Dependency Injection is a software design pattern that
allows objects to be created and configured dynamically by
an external framework or container, rather than being
instantiated and configured by the objects themselves. In
Dependency Injection, the objects specify their
dependencies as interfaces, and the framework provides the
concrete implementation of those interfaces at runtime,
without requiring the objects to know about the specific
implementation details.
Overall, Dependency Injection helps to reduce the
complexity of managing dependencies in large software
applications, making it easier to maintain and test the
code.
```

- **What is IOC (Inversion of Control)?**

```
In Spring IOC, the control of the flow of an application is
inverted or flipped from the application itself to the
Spring container, which takes care of instantiating and
configuring objects, and managing their dependencies.

Spring IOC is typically configured using an XML file or
annotations, which specify the dependencies between
objects, and allow Spring to automatically wire the objects
together at runtime.
```

- **What is Auto Wiring?**

```
In Spring, Autowiring is a feature that allows Spring to
automatically wire together the dependencies of beans
(objects) in a Spring-based application. Autowiring
eliminates the need for manual wiring of beans by
automatically detecting the dependencies and injecting them
at runtime.
Spring can also use annotations such as @Autowired,
@Qualifier, and @Resource to specify the dependencies.
```

- **What are Bean Factory and Application Context?**

```
Both Bean Factory and Application Context are configurable
using XML files or Java annotations, and allow developers
to define and configure beans and their dependencies. The
choice between using Bean Factory and Application Context
depends on the specific requirements of the application,
with Bean Factory being a good choice for simple
applications, and Application Context being more suitable
for larger and more complex applications.
```

- **How do you create an application context with Spring?**

```
To create an application context with Spring, you typically
need to perform the following steps:

Choose a type of application context to create, such as
AnnotationConfigApplicationContext or ClassPathXmlApplicationContext.

Create an instance of the chosen application context class.

Use the application context to retrieve any required
components or beans.
```

```
// Create an instance of the AnnotationConfigApplicationContext class
AnnotationConfigApplicationContext context = new AnnotationConfigApplicationContext();
```

- **What is a Component Scan?**

In Spring, component scanning is a feature that allows the framework to automatically discover and register beans based on classpath scanning.

By using component scanning, you can avoid the need to explicitly configure individual beans in your Spring configuration files. Instead, you can simply annotate your classes with certain annotations (such as @Component, @Service, @Controller, or @Repository), and Spring will automatically detect and register those classes as beans.

- **What does @Autowired signify?**

```
In Spring, the @Autowired annotation is used to automatically wire (i.e., inject)
 dependencies into a bean.

When you annotate a field, constructor, or setter method with @Autowired, Spring will
look for a matching bean of the required type in the application context, and
automatically wire it into the annotated component.
```

- **What is the default scope of a bean?**

```
In Spring, the default scope of a bean is singleton.

This means that by default, Spring will create a single instance of the bean and share
it across all the application's components that require it. Whenever a component
requests the bean from the application context, Spring will return the same shared
instance.


For example, consider the following class:
@Service
public class MyService {
}

In this example, MyService is annotated with @Service, which is a specialization of the
@Component annotation. By default, Spring will create a single instance of MyService
and share it across all the components that require it.
```

- **Are Spring beans thread safe?**

```
It depends on the implementation and scope of the bean. By default, Spring beans are
singleton-scoped and shared across threads, so if a bean maintains mutable state, it
may not be thread-safe. To ensure thread-safety, synchronization or other thread-safe
techniques can be used, or a different scope, such as prototype scope, can be used to
avoid shared mutable state.
```

- **What are the different types of dependency injections?**

```
There are three main types of dependency injection:

Constructor Injection: Dependencies are injected through a class constructor. This is
the most commonly used type of injection.

Setter Injection: Dependencies are injected through a setter method of the class.

Interface Injection: Dependencies are injected through an interface that is implemented
by the class. This type of injection is less common than the other two.
```

- **What is the difference between XML and Java Configurations for Spring?**

```
Both approaches have their advantages and disadvantages. XML Configuration is more
flexible and can be easier to manage for larger projects. Java Configuration is more
concise, readable, and can benefit from the type-safety of the Java language.
Ultimately, the choice between the two depends on the specific needs of the project and
personal preferences.
```

- **How do you debug problems with Spring Framework?**

```
Debugging problems with Spring Framework involves the following steps:

Check the logs: Spring Framework logs detailed information about its operations and any
issues that occur. Checking the logs can help identify the root cause of the problem.

Review the code: Review the code to ensure that it is correctly configured and that the
dependencies are properly injected.

Check the configuration: Review the Spring configuration files or Java code to ensure
that the application context is correctly configured.

Use debugging tools: Use a debugger to step through the code and identify the specific
location where the problem is occurring. Tools like Eclipse or IntelliJ IDEA provide
debugging support for Spring applications.

Check external dependencies: Verify that any external dependencies, such as databases
or web services, are correctly configured and accessible.

Seek help from the community: If the problem is complex, seek help from the Spring
community by posting on forums or using other support channels.
```

- **What are important Spring Modules?**

```
Spring is a very comprehensive framework with many modules that provide different
functionalities for building enterprise applications. Some of the most important Spring
modules are:

Spring Core: This module provides the basic features of the Spring framework, including
the Inversion of Control (IoC) container and the Dependency Injection (DI) mechanism.

Spring MVC: This module provides a web framework for building web applications, with
support for handling requests, processing views, and managing the application flow.

Spring Data: This module provides a consistent and simple programming model for data
access, with support for many different types of data stores, such as relational
databases, NoSQL databases.

Spring Security: This module provides a comprehensive security framework for protecting
web applications and services, with support for authentication, authorization, and
secure communication.
```

Spring Integration: This module provides support for building integration solutions, such as messaging systems, ETL pipelines, and event-driven architectures.

Spring Cloud: This module provides tools and frameworks for building and deploying cloud-native applications, with support for service discovery, configuration management, and distributed tracing.

Spring Boot: This module provides a set of opinionated configurations and conventions for building Spring applications, with the goal of reducing development time and increasing productivity.

These are just a few examples of the many Spring modules available. Each module provides a specific set of features and functionalities, allowing developers to choose the ones that best fit their project requirements.

- **Name some of the design patterns used in Spring Framework?**

```
Spring Framework makes use of several design patterns to provide a flexible and
extensible architecture for building enterprise applications. Some of the design
patterns used in Spring Framework are:

Dependency Injection (DI): Spring makes extensive use of the DI pattern to inject
dependencies into components, decoupling the dependencies and providing flexibility in
component configuration.

Singleton Pattern: Many of the Spring beans are configured as singletons, ensuring that
only one instance of a particular bean is created and shared across the application.

Template Method Pattern: Spring uses the template method pattern in its core JDBC and
Hibernate support to provide a consistent way of performing database operations.

Proxy Pattern: Spring uses the proxy pattern extensively to provide AOP
(Aspect-Oriented Programming) features such as transaction management, caching, and
security.
```

- **What do you think about Spring Framework?**

```
Spring Framework is a widely used open-source framework for building enterprise
applications in Java. It provides a comprehensive set of features and functionalities
for building scalable, flexible, and robust applications. Spring Framework makes use of
many design patterns and architectural principles to provide a modular and extensible
architecture, which simplifies application development and maintenance.
```

Spring mvc

- # What is Model 1 architecture?

In a Model 1 architecture, the presentation logic (HTML, CSS, etc.) and business logic (Java code) are typically tightly coupled together in a single servlet or JSP page. This can make it difficult to maintain and evolve the application over time, especially as it grows in complexity.

- # What is Model 2 architecture?

```
In Spring, Model 2 architecture refers to the Model-View-Controller (MVC) pattern used for building web applications. The MVC pattern separates an application into three distinct components:

Model: The model contains the application's data and business logic. It can also interact with a database or other external systems.

View: The view displays the data to the user and handles user input. In Spring MVC, views are typically implemented using JSP pages or HTML templates.

Controller: The controller handles user input, communicates with the model to retrieve or modify data, and selects the appropriate view to display the response.
```

- **Can you show an example controller method in Spring MVC?**

```
@RequestMapping("/books")
public class BookController {

    @Autowired
    private BookService bookService;

    @GetMapping("/{id}")
    public String getBook(@PathVariable Long id, Model model) {
        Book book = bookService.getBookById(id);
        model.addAttribute("book", book);
        return "book-details";
    }
```

- **Can you explain a simple flow in Spring MVC?**

```
Here's a simple flow in Spring MVC:

The user sends a request to the server by entering a URL or clicking a link.

The request is received by the Servlet container, which passes it to the DispatcherServlet, the entry
point of Spring MVC.

The DispatcherServlet maps the request to a specific controller based on the URL mapping defined in the
application configuration.

The controller processes the request by interacting with the model, which contains the application data
and business logic.

The controller selects the appropriate view to render the response, based on the logic of the
application and the data in the model.

The view is rendered by a view resolver, which maps the view name to the actual view file (JSP or HTML
template).

The response is sent back to the client, usually as an HTML page, JSON or XML response.
```

- # What is Model?

In the context of Spring MVC, the Model is a component responsible for encapsulating the application data and business logic. It represents the state of the application and provides a way for controllers to interact with that state.

In the Model-View-Controller (MVC) pattern, the Model is the component responsible for managing the application data and providing it to the view for display. The Model can also include business logic, validation rules, and other application-specific behavior.

- # What is ModelAndView?

In Spring MVC, ModelAndView is a class that represents both a model and a view. It's a container that holds data to be displayed in the view and specifies which view should be rendered to the user.

```
@GetMapping("/products/{id}")
public ModelAndView getProduct(@PathVariable Long id) {
    Product product = productService.getProductById(id);
    ModelAndView mav = new ModelAndView("product-details");
    mav.addObject("product", product);
    return mav;
}
```

Overall, ModelAndView provides a flexible and powerful way to encapsulate both data and view information in a single object, making it easier to pass data between controllers and views in Spring MVC.

- # What is a RequestMapping?

```
In Spring MVC, @RequestMapping is an annotation that is used to map a web request to a specific handler method in a controller. It's used to define which URL patterns should be handled by which controller methods.

The @RequestMapping annotation can be used at the class level to define a base URL for all requests handled by the controller, and at the method level to define the specific URL pattern for a particular handler method.
```

- # How is validation done using Spring MVC?

In Spring MVC, validation is typically performed using the javax.validation API, which provides a set of annotations for validating the data entered by users in HTML forms.

To use validation in Spring MVC, you first need to annotate the model class with validation annotations. For example, to validate a Product object, you can annotate its fields using the @NotNull and @Size annotations:

```
public class Product {
    @NotNull
    private Long id;

    @NotNull
    @Size(min = 1, max = 50)
    private String name;

    @NotNull
    private BigDecimal price;
}
```

- # What are Spring Form Tags?

```
Spring Form Tags are a set of custom tags provided by the Spring MVC framework that allow you to bind
HTML form elements to model objects and validate user input.

Spring Form Tags include the following:

<form:form>
<form:input>
<form:select>
<form:checkbox>
<form:radiobutton>
```

- # What is a Path Variable?

```
In Spring MVC, a Path Variable is a parameter extracted from the URL path of a request mapping. It is used to capture dynamic values from the URL and pass them to the controller method as a parameter.

Path Variables are defined in a request mapping using curly braces {}.
```

```
@GetMapping("/users/{id}")
```

- # What is a Session Attribute?

Session Attributes are typically used to store data that is specific to a particular user session, such as a shopping cart or user preferences. They can be added to the HttpSession object using the session.setAttribute method or by using the @SessionAttribute annotation.

```
@GetMapping("/shopping-cart")
public String showShoppingCart(@SessionAttribute("cart") ShoppingCart cart, Model model) {
    model.addAttribute("cart", cart);
    return "shopping-cart";
}
```

In this example, the @SessionAttribute("cart") annotation is used to retrieve the "cart" object from the HttpSession and pass it as a parameter to the showShoppingCart method. The ShoppingCart object is then added to the model and passed to the shopping-cart view, where it can be used to display the contents of the shopping cart.

- **How do you set default date format with Spring?**

```
In Spring, you can set the default date format by using the @DateTimeFormat annotation at the class level or by defining a global date format in the application context.

Here's an example of setting the default date format using @DateTimeFormat annotation:
```

```java
@Data
public class Person {
    @DateTimeFormat(pattern = "dd/MM/yyyy")
    private LocalDate birthDate;
}
```

- # Why is Spring MVC so popular?

```
Spring MVC is a popular web framework for several reasons:

Modularity: Spring MVC is part of the larger Spring framework, which is a modular framework for
building enterprise applications.

Dependency Injection: Spring MVC uses Dependency Injection (DI), which helps in decoupling the
components and promoting code reuse. This makes it easier to write clean, maintainable code.

Annotation-based programming model: Spring MVC makes use of annotations to define the mappings between
controllers and URLs. This eliminates the need for verbose XML configuration and makes it easier to
read and maintain the code.

Wide community support: Spring MVC has a large and active community of developers who contribute to the
framework and provide support through forums and mailing lists. This means that there is a wealth of
documentation, examples, and third-party libraries available, making it easier to get help when needed.
```

Spring Boot

- # What is Spring Boot?

Spring Boot is an open-source Java-based framework that is used to create standalone, production-grade applications with minimum configuration. It is based on the Spring framework and provides a simpler and faster way to create production-ready applications.

Spring Boot allows developers to quickly build applications that can be run as standalone executables, microservices, or deployed in containers. It comes with a range of pre-built features such as embedded servers, metrics, health checks, security, and externalized configuration. It also provides easy integration with other Spring projects such as Spring Data, Spring Security, and Spring Cloud.

- **What are the important Features of Spring Boot?**

```
The key features of Spring Boot include:

    Easy to create standalone Spring applications

    Opinionated approach to configuration, minimizing the need for boilerplate code

    Built-in support for common non-functional features such as metrics, health checks, and security

    Integration with a wide range of third-party libraries and frameworks

    Support for both traditional and cloud-native deployment models
```

- **Compare Spring Boot vs Spring?**

```
Spring Boot and Spring are both Java-based frameworks used to build enterprise applications,
but there are some key differences between them.

Spring is a comprehensive framework that provides a wide range of features for building
enterprise applications, such as dependency injection, AOP, data access, transaction
management, and MVC web applications. Spring requires a significant amount of configuration to
set up, which can be time-consuming.

Spring Boot, on the other hand, is built on top of Spring and provides a simplified approach to
building Spring applications with minimal configuration. Spring Boot provides a range of
features out of the box, such as embedded servers, metrics, health checks, security, and
externalized configuration, which can be easily configured and customized as needed.
```

- What is the importance of @SpringBootApplication?

```
the @SpringBootApplication annotation provides a convenient way to configure and bootstrap a Spring Boot application with minimal code. It helps to reduce the amount of boilerplate code required to set up a Spring Boot application, and allows developers to focus on writing business logic instead of configuration.
```

- # What is Auto Configuration?

```
Auto Configuration is a powerful feature in Spring Boot that helps developers to get started quickly and easily with Spring applications, without having to spend time configuring every aspect of their application.
```

- # What is an embedded server? Why is it important?

```
embedded servers are an important feature in Spring Boot that make it easier to develop and deploy web applications, while providing high performance and flexibility.
```

```
Some benefits of using embedded servers in Spring Boot include:

Simplified deployment: Since the embedded server is packaged with the application, there is no need to install or configure a separate web server. This makes deployment much simpler and faster.

Easy testing: Embedded servers can be started and stopped programmatically, which makes it easy to write automated tests that simulate user requests and verify the application's behavior.

Performance: Embedded servers are optimized for running web applications, and can handle high traffic loads efficiently.

Flexibility: Spring Boot supports multiple embedded servers, which gives developers the flexibility to choose the server that best fits their needs.
```

- **What is the default embedded server with Spring Boot?**

```
The default embedded server used by Spring Boot is Tomcat. Tomcat is a widely-used web server and
servlet container that is fast, reliable, and easy to use. Spring Boot includes an embedded
version of Tomcat, which means that developers can build and deploy web applications without
needing to install and configure an external Tomcat server.
```

- # What is Spring Initializr?

```
Spring Initializr is a web-based tool that allows developers to quickly create and configure new
Spring Boot projects. It provides a simple user interface for selecting project dependencies,
configuring project settings, and downloading a fully configured project structure.

With Spring Initializr, developers can create new Spring Boot projects in minutes, without having
to manually configure all the necessary dependencies and settings. The tool generates a project
structure that includes a default set of files and directories, as well as a pre-configured build
configuration and application.properties file.
```

- # What is application.properties?

```
application.properties is a configuration file used in Spring Boot applications to provide
configuration settings for various components of the application. It is a plain text file that
can be located in the root of the classpath, in the src/main/resources directory of a Maven
project.

The application.properties file uses a simple key-value format to specify configuration settings.
These settings can include database connection details, server settings, logging levels, and
other application-specific settings.
```

- # What is @ConfigurationProperties?

@ConfigurationProperties is an annotation in Spring Boot that is used to bind external configuration properties to a Java class. By using this annotation, developers can create Java objects that represent the configuration properties, and Spring Boot will automatically bind the values of those properties from external configuration files or environment variables.

For example, suppose we have a Spring Boot application that needs to connect to a database, and we have defined the connection details in an external application.properties file. We can create a Java class with fields that correspond to the configuration properties, and annotate the class with @ConfigurationProperties to bind the values of those properties to the class fields.

```java
@Configuration
@ConfigurationProperties(prefix = "database")
public class DatabaseConfig {
    private String url;
    private String username;
    private String password;

    // Getters and setters
}
```

- # What is Spring Boot Actuator?

```
Spring Boot Actuator is a feature of Spring Boot that provides a set of production-ready tools
and APIs for monitoring and managing Spring Boot applications. It enables developers to easily
expose various metrics and health checks for their applications, as well as interact with the
running application and manage its internals.
```

- # What is a CommandLineRunner?

```
CommandLineRunner is an interface in Spring Boot that provides a simple way to execute code after the application has started up and the Spring context has been fully initialized.

CommandLineRunner is a convenient way to perform any initialization or setup tasks needed by a Spring Boot application, and can be used to ensure that the application is fully ready to serve requests before it starts running.
```

- **What is Spring JDBC? How is different from JDBC?**

```
Spring JDBC is a module in the Spring Framework that provides a higher-level abstraction over the
Java Database Connectivity (JDBC) API, making it easier to work with databases in Java
applications. It simplifies the development of database access code by handling low-level details
such as connection management and exception handling, allowing developers to focus on writing
business logic.
```

- # What is a JdbcTemplate?

```
JdbcTemplate provides a convenient and streamlined API for executing SQL statements and queries
in Spring applications, and simplifies many of the low-level details of JDBC programming.
```

- # What is JPA?

JPA provides a set of interfaces and annotations that allow developers to map Java objects to relational database tables, and to perform database operations on those objects using a high-level, object-oriented API. By using JPA, developers can avoid writing low-level SQL code and instead focus on the domain model and business logic of their application.

- # What is Hibernate?

```
Hibernate is an open-source Object-Relational Mapping (ORM) framework for Java. It provides a
high-level, object-oriented API for mapping Java objects to relational database tables, and for
performing database operations on those objects.

Hibernate is often used in conjunction with JPA (Java Persistence API) to simplify the
development of database-driven applications.
```

- **How do you define an entity in JPA?**

```
In JPA, an entity is a persistent class that maps to a database table. To define an entity in
JPA, you need to follow these steps:

Create a Java class that represents the entity. The class must have a public or protected
no-argument constructor, and it must be annotated with the @Entity annotation.

Define the attributes of the entity as private or protected fields. Each field should have a
getter and setter method, and it can be annotated with various JPA annotations to specify the
mapping to the database table, such as @Id for the primary key, @Column for the column name, and
@GeneratedValue for the automatic generation of primary key values.
```

- # What is Spring Data?

Spring Data is a framework within the Spring Framework that simplifies the development of data access layers in Java applications. It provides a consistent, high-level programming model for interacting with different data stores such as relational databases, NoSQL databases, and more.

Spring Data is designed to make it easy to perform common data access operations such as querying, updating, and deleting data, as well as providing support for pagination, sorting, and caching. It does this by providing a set of powerful abstractions and utilities that can be used across multiple data stores, along with specific implementations for different data stores.

- # What is Spring Data JPA?

```
Spring Data JPA is a sub-project of Spring Data that provides a powerful abstraction layer on top
of JPA (Java Persistence API). It aims to simplify the development of data access layers in Java
applications that use JPA for object-relational mapping.

Spring Data JPA builds upon the standard JPA annotations and provides additional annotations and
abstractions to make working with JPA easier and more efficient.
```

- # What is a CrudRepository?

```
In Spring Data, CrudRepository is an interface that provides a set of generic CRUD (Create, Read, Update, Delete) methods for working with a data store. It is a sub-interface of the Repository interface and provides additional methods for saving, deleting, and retrieving entities from the data store.
```

RESTful Web Services

- # What is REST?

```
REST stands for Representational State Transfer, which is an architectural style
used for building web services. RESTful web services are designed to work on the
 web's existing HTTP protocol, using HTTP methods such as GET, POST, PUT, and
 DELETE to manipulate resources.

In a RESTful architecture, a resource is anything that can be identified by a
unique identifier or URL, such as a user account, a blog post, or an image file. A
RESTful service exposes a set of URLs or endpoints, each of which represents a
specific resource, and clients can interact with the service by sending HTTP
requests to these endpoints.
```

- **What are the key concepts in designing RESTful API?**

```
There are several key concepts to keep in mind when designing a RESTful API:

Resource identification: A resource should be identified by a unique identifier,
such as a URL. The URL should be consistent, predictable, and easy to understand.

Resource representation: A resource should be represented in a specific format,
such as JSON or XML.

HTTP methods: HTTP methods (such as GET, POST, PUT, and DELETE) should be used to
manipulate resources. Each method should have a specific purpose and should follow
the HTTP specification.

Stateless: The API should be designed to be stateless, meaning that each request
should contain all the information needed to complete the request. This allows for
better scalability and reliability.
```

- **What are the Best Practices of RESTful Services?**

```
Here are some best practices for designing and implementing RESTful services:

Use HTTP methods correctly: Use HTTP methods (GET, POST, PUT, DELETE, etc.) in the
appropriate way. For example, use GET for retrieving resources, POST for creating
new resources, PUT for updating resources, and DELETE for deleting resources.

Use resource naming conventions: Use descriptive, consistent, and intuitive names
for resources and their corresponding URLs. Avoid using verbs in the URL, and use
plural nouns for collections of resources.

Use HTTP status codes: Use HTTP status codes to communicate the status of API
requests to clients. For example, use 200 for a successful request, 400 for a bad
request, 404 for a resource not found, and 500 for server errors.
```

- **What is GetMapping and what are the related methods available in Spring MVC?**

```
GetMapping is a Spring MVC annotation used to map HTTP GET requests to a specific
handler method in a controller class. When a GET request is made to a URL that
matches the specified mapping value, the handler method annotated with GetMapping
is invoked to handle the request.

In addition to GetMapping, Spring MVC provides several other HTTP method mapping
annotations:

@PostMapping - maps HTTP POST requests
@PutMapping - maps HTTP PUT requests
@DeleteMapping - maps HTTP DELETE requests
@PatchMapping - maps HTTP PATCH requests
```

- **What is the appropriate HTTP Response Status for successful execution of a Resource Creation?**

```
The appropriate HTTP response status for a successful creation of a resource is
201 Created. This status code indicates that a new resource has been successfully
created and is available at the location specified in the Location header of the
response.
```

- **Why do we use ResponseEntity in a RESTful Service?**

```
In a RESTful service, ResponseEntity is used to construct HTTP responses returned
from the server to the client. It provides a way to customize the HTTP response
status, headers, and body.
```

Here are some reasons why ResponseEntity is commonly used in RESTful services:

* Flexibility: ResponseEntity allows developers to customize the HTTP response status, headers, and body based on the requirements of the API. This can be especially useful when dealing with errors or exceptions.

* Error handling: ResponseEntity can be used to construct error responses with appropriate HTTP status codes and error messages. This allows the client to understand what went wrong and take corrective action.

* Consistency: Using ResponseEntity can help ensure consistency in the responses returned from the API. By specifying the HTTP response status and headers in a consistent manner, clients can more easily understand and work with the API.

* Testing: ResponseEntity can be used to verify that the API is returning the expected HTTP response status, headers, and body. This can help with testing and debugging the API.

- **How do you handle Validation Errors with RESTful Web Services?**

```
To handle validation errors in RESTful web services, you can follow these steps:

Use input validation to check the request data before processing it.

If validation fails, return a response with an appropriate HTTP status code (such as 400 Bad Request) and an error message that explains the validation error.

Include details about the specific validation error in the response body (such as the field name and error message).

If possible, provide links or other information that can help the client correct the validation error.

Log the validation error on the server side for debugging purposes.
```