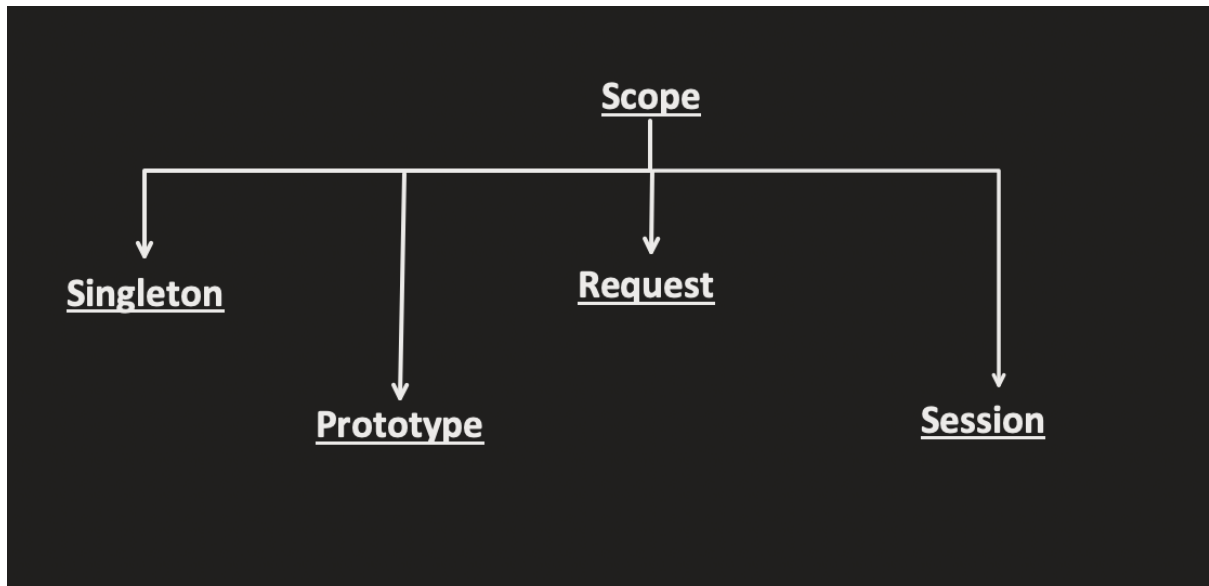


Springboot: Bean Scopes by Concept & Coding



Singleton:

- Default scope
- Only 1 instance created per IOC.
- Eagerly initialized by IOC (means at the time of application startup, object get created)

```
@RestController
@RequestMapping(value = "/api/")
public class TestController1 {

    @Autowired
    User user;

    public TestController1(){
        System.out.println("TestController1 instance initialization");
    }

    @PostConstruct
    public void init(){
        System.out.println("TestController1 object hashCode: " + this.hashCode() +
            " User object hashCode: " + user.hashCode());
    }

    @GetMapping(path = "/fetchUser")
    public ResponseEntity<String> getUserDetails() {
        System.out.println("fetchUser api invoked");
        return ResponseEntity.status(HttpStatus.OK).body("");
    }
}
```

```
@RestController
@RequestMapping(value = "/api/")
@Scope(value = ConfigurableBeanFactory.SCOPE_SINGLETON)
public class TestController2 {

    @Autowired
    User user;

    public TestController2() {
        System.out.println("TestController2 instance initialization");
    }

    @PostConstruct
    public void init(){
        System.out.println("TestController2 object hashCode: " + this.hashCode() +
            " User object hashCode: " + user.hashCode());
    }

    @GetMapping(path = "/fetchUser2")
    public ResponseEntity<String> getUserDetails() {
        System.out.println("fetchUser2 api invoked");
        return ResponseEntity.status(HttpStatus.OK).body("");
    }
}
```

```
@Component
@Scope("singleton")
public class User {

    public User() {
        System.out.println("User initialization");
    }

    @PostConstruct
    public void init(){
        System.out.println("User object hashCode: " + this.hashCode());
    }
}
```

```
2024-05-01T13:12:47.754+05:30 INFO 36566 --- [main] c.c.l.SpringbootApplication
2024-05-01T13:12:47.755+05:30 INFO 36566 --- [main] c.c.l.SpringbootApplication
2024-05-01T13:12:48.182+05:30 INFO 36566 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T13:12:48.188+05:30 INFO 36566 --- [main] o.apache.catalina.core.StandardService
2024-05-01T13:12:48.188+05:30 INFO 36566 --- [main] o.apache.catalina.core.StandardEngine
2024-05-01T13:12:48.213+05:30 INFO 36566 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T13:12:48.213+05:30 INFO 36566 --- [main] w.s.c.ServletWebServerApplicationContext
TestController1 instance initialization
User initialization
User object hashCode: 1140282235
TestController1 object hashCode: 1846382571 User object hashCode: 1140282235
TestController2 instance initialization
TestController2 object hashCode: 1525241687 User object hashCode: 1140282235
2024-05-01T13:12:48.365+05:30 INFO 36566 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T13:12:48.369+05:30 INFO 36566 --- [main] c.c.l.SpringbootApplication
2024-05-01T13:13:50.207+05:30 INFO 36566 --- [nio-8090-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T13:13:50.207+05:30 INFO 36566 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
2024-05-01T13:13:50.208+05:30 INFO 36566 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
```

localhost:8090/api/fetchUser

```
2024-05-01T13:12:47.754+05:30 INFO 36566 --- [main] c.c.l.SpringbootApplication
2024-05-01T13:12:47.755+05:30 INFO 36566 --- [main] c.c.l.SpringbootApplication
2024-05-01T13:12:48.182+05:30 INFO 36566 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T13:12:48.188+05:30 INFO 36566 --- [main] o.apache.catalina.core.StandardService
2024-05-01T13:12:48.188+05:30 INFO 36566 --- [main] o.apache.catalina.core.StandardEngine
2024-05-01T13:12:48.213+05:30 INFO 36566 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T13:12:48.213+05:30 INFO 36566 --- [main] w.s.c.ServletWebServerApplicationContext
TestController1 instance initialization
User initialization
User object hashCode: 1140202235
TestController1 object hashCode: 1046302571 User object hashCode: 1140202235
TestController2 instance initialization
TestController2 object hashCode: 1525241607 User object hashCode: 1140202235
2024-05-01T13:12:48.365+05:30 INFO 36566 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T13:12:48.369+05:30 INFO 36566 --- [main] c.c.l.SpringbootApplication
2024-05-01T13:13:50.207+05:30 INFO 36566 --- [nio-8090-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T13:13:50.207+05:30 INFO 36566 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
2024-05-01T13:13:50.208+05:30 INFO 36566 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
fetchUser api invoked
```

Prototype:

- Each time new Object is created.
- Its Lazily Initialized, means when object is created only when its required.

```
@RestController
@Scope(ConfigurableBeanFactory.SCOPE_PROTOTYPE)
@RequestMapping(value = "/api/")
public class TestController1 {

    @Autowired
    User user;

    @Autowired
    Student student;

    public TestController1() {
        System.out.println("TestController1 instance initialization");
    }

    @PostConstruct
    public void init() {
        System.out.println("TestController1 object hashCode: " + this.hashCode() +
            " User object hashCode: " + user.hashCode() +
            " Student object hashCode: " + student.hashCode());
    }

    @GetMapping(path = "/fetchUser")
    public ResponseEntity<String> getUserDetails() {
        System.out.println("fetchUser api invoked");
        return ResponseEntity.status(HttpStatus.OK).body("");
    }
}
```

```
@Component
public class Student {

    @Autowired
    User user;

    public Student() {
        System.out.println("Student instance initialization");
    }

    @PostConstruct
    public void init(){
        System.out.println("Student object hashCode: " + this.hashCode() +
            " User object hashCode: " + user.hashCode());
    }
}
```

```
@Component
@Scope("prototype")
public class User {

    public User() {
        System.out.println("User initialization");
    }

    @PostConstruct
    public void init(){
        System.out.println("User object hashCode: " + this.hashCode());
    }
}
```

```
2024-05-01T13:32:00.689+05:30 INFO 37722 --- [main] c.c.l.SpringbootApplication
2024-05-01T13:32:00.691+05:30 INFO 37722 --- [main] c.c.l.SpringbootApplication
2024-05-01T13:32:01.130+05:30 INFO 37722 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T13:32:01.136+05:30 INFO 37722 --- [main] o.apache.catalina.core.StandardService
2024-05-01T13:32:01.136+05:30 INFO 37722 --- [main] o.apache.catalina.core.StandardEngine
2024-05-01T13:32:01.160+05:30 INFO 37722 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T13:32:01.160+05:30 INFO 37722 --- [main] w.s.c.ServletWebServerApplicationContext
Student instance initialization
User initialization
User object hashCode: 1510009630
Student object hashCode: 2092450685 User object hashCode: 1510009630
2024-05-01T13:32:01.328+05:30 INFO 37722 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T13:32:01.333+05:30 INFO 37722 --- [main] c.c.l.SpringbootApplication
```

🕒 localhost:8090/api/fetchUser

```
2024-05-01T13:32:00.689+05:30 INFO 37722 --- [main] c.c.l.SpringbootApplication : Starting
2024-05-01T13:32:00.691+05:30 INFO 37722 --- [main] c.c.l.SpringbootApplication : No activ
2024-05-01T13:32:01.130+05:30 INFO 37722 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat i
2024-05-01T13:32:01.136+05:30 INFO 37722 --- [main] o.apache.catalina.core.StandardService : Starting
2024-05-01T13:32:01.136+05:30 INFO 37722 --- [main] o.apache.catalina.core.StandardEngine : Starting
2024-05-01T13:32:01.160+05:30 INFO 37722 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/] : Initiali
2024-05-01T13:32:01.160+05:30 INFO 37722 --- [main] w.s.c.ServletWebServerApplicationContext : Root Web
Student instance initialization
User initialization
User object hashCode: 1510009630
Student object hashCode: 2092450685 User object hashCode: 1510009630
2024-05-01T13:32:01.328+05:30 INFO 37722 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat s
2024-05-01T13:32:01.333+05:30 INFO 37722 --- [main] c.c.l.SpringbootApplication : Started
2024-05-01T13:32:50.142+05:30 INFO 37722 --- [nio-8090-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initiali
2024-05-01T13:32:50.142+05:30 INFO 37722 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet : Initiali
2024-05-01T13:32:50.143+05:30 INFO 37722 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet : Complete
TestController1 instance initialization
User initialization
User object hashCode: 1984730322
TestController1 object hashCode: 1786739287 User object hashCode: 1984730322 Student object hashCode: 2092450685
fetchUser api invoked
```

Request:

- New Object is created for each HTTP request.
- Lazily initialized.

```
@RestController
@Scope("request")
@RequestMapping(value = "/api/")
public class TestController1 {

    @Autowired
    User user;

    @Autowired
    Student student;

    public TestController1() {
        System.out.println("TestController1 instance initialization");
    }

    @PostConstruct
    public void init() {
        System.out.println("TestController1 object hashCode: " + this.hashCode() +
            " User object hashCode: " + user.hashCode() +
            " Student object hashCode: " + student.hashCode());
    }

    @GetMapping(path = "/fetchUser")
    public ResponseEntity<String> getUserDetails() {
        System.out.println("fetchUser api invoked");
        return ResponseEntity.status(HttpStatus.OK).body("");
    }
}
```

```
@Component
@Scope("prototype")
public class Student {

    @Autowired
    User user;

    public Student() {
        System.out.println("Student instance initialization");
    }

    @PostConstruct
    public void init() {
        System.out.println("Student object hashCode: " + this.hashCode() +
            " User object hashCode: " + user.hashCode());
    }
}
```

```
@Component
@Scope("request")
public class User {

    public User() {
        System.out.println("User initialization");
    }

    @PostConstruct
    public void init() {
        System.out.println("User object hashCode: " + this.hashCode());
    }
}
```

```

 ____
/  _ \   _ __   ___
(  )_ /  | | | | / _ \
\  __/   | |_| | |  __/
 \___|   |_____| \___|
:: Spring Boot :: (v3.2.3)
```

```
2024-05-01T14:13:02.583+05:30 INFO 40344 --- [main] c.c.l.SpringbootApplication : Starting SpringbootApplication using Java 21.0.
2024-05-01T14:13:02.584+05:30 INFO 40344 --- [main] c.c.l.SpringbootApplication : No active profile set, falling back to 1 default
2024-05-01T14:13:03.026+05:30 INFO 40344 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port 8090 (http)
2024-05-01T14:13:03.033+05:30 INFO 40344 --- [main] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2024-05-01T14:13:03.033+05:30 INFO 40344 --- [main] o.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/10.1.19
2024-05-01T14:13:03.059+05:30 INFO 40344 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationConte
2024-05-01T14:13:03.059+05:30 INFO 40344 --- [main] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization comp
2024-05-01T14:13:03.205+05:30 INFO 40344 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8090 (http) with context
2024-05-01T14:13:03.209+05:30 INFO 40344 --- [main] c.c.l.SpringbootApplication : Started SpringbootApplication in 0.795 seconds
```

localhost:8090/api/fetchUser

```
2024-05-01T14:13:03.033+05:30 INFO 40344 --- [main] o.apache.catalina.core.StandardEngine : Starting Servlet engine:
2024-05-01T14:13:03.059+05:30 INFO 40344 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embed
2024-05-01T14:13:03.059+05:30 INFO 40344 --- [main] w.s.c.ServletWebServerApplicationContext : Root WebApplicationConte
2024-05-01T14:13:03.205+05:30 INFO 40344 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 80
2024-05-01T14:13:03.209+05:30 INFO 40344 --- [main] c.c.l.SpringbootApplication : Started SpringbootApplica
2024-05-01T14:14:05.931+05:30 INFO 40344 --- [nio-8090-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring Dispa
2024-05-01T14:14:05.931+05:30 INFO 40344 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet : Initializing Servlet 'dis
2024-05-01T14:14:05.932+05:30 INFO 40344 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet : Completed initialization
TestController1 instance initialization
User initialization
User object hashCode: 39793984
Student instance initialization
Student object hashCode: 275139209 User object hashCode: 39793984
TestController1 object hashCode: 898967761 User object hashCode: 39793984 Student object hashCode: 275139209
fetchUser api invoked
```

localhost:8090/api/fetchUser

```
2024-05-01T14:13:03.205+05:30 INFO 40344 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started d
2024-05-01T14:13:03.209+05:30 INFO 40344 --- [main] c.c.l.SpringbootApplication : Started Springbo
2024-05-01T14:14:05.931+05:30 INFO 40344 --- [nio-8090-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spr
2024-05-01T14:14:05.931+05:30 INFO 40344 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet : Initializing Ser
2024-05-01T14:14:05.932+05:30 INFO 40344 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet : Completed initia
TestController1 instance initialization
User initialization
User object hashCode: 39793904
Student instance initialization
Student object hashCode: 275139209 User object hashCode: 39793904
TestController1 object hashCode: 898967761 User object hashCode: 39793904 Student object hashCode: 275139209
fetchUser api invoked
TestController1 instance initialization
User initialization
User object hashCode: 1227388929
Student instance initialization
Student object hashCode: 1206886228 User object hashCode: 1227388929
TestController1 object hashCode: 1137709937 User object hashCode: 1227388929 Student object hashCode: 1206886228
fetchUser api invoked
```

Consider below, What will happen?

```
@RestController
@Scope("singleton")
@RequestMapping(value = "/api/")
public class TestController1 {

    @Autowired
    User user;

    public TestController1() {
        System.out.println("TestController1 instance initialization");
    }

    @PostConstruct
    public void init() {
        System.out.println("TestController1 object hashCode: " + this.hashCode() +
            " User object hashCode: " + user.hashCode());
    }

    @GetMapping(path = "/fetchUser")
    public ResponseEntity<String> getUserDetails() {
        System.out.println("fetchUser api invoked");
        return ResponseEntity.status(HttpStatus.OK).body("");
    }
}
```

```
@Component
@Scope("request")
public class User {

    public User() {
        System.out.println("User initialization");
    }

    @PostConstruct
    public void init(){
        System.out.println("User object hashCode: " + this.hashCode());
    }
}
```

```
2024-05-01T14:19:25.563+05:30 INFO 40699 --- [main] o.apache.catalina.core.StandardService : Starting service [Tomcat]
2024-05-01T14:19:25.563+05:30 INFO 40699 --- [main] o.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/10.1.19]
2024-05-01T14:19:25.590+05:30 INFO 40699 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext
2024-05-01T14:19:25.591+05:30 INFO 40699 --- [main] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 44
TestController1 instance initialization
2024-05-01T14:19:25.617+05:30 WARN 40699 --- [main] ConfigServletWebServerApplicationContext : Exception encountered during context initialization - canceling
2024-05-01T14:19:25.619+05:30 INFO 40699 --- [main] o.apache.catalina.core.StandardService : Stopping service [Tomcat]
2024-05-01T14:19:25.626+05:30 INFO 40699 --- [main] .s.b.a.l.ConditionEvaluationReportLogger :

Error starting ApplicationContext. To display the condition evaluation report re-run your application with 'debug' enabled.
2024-05-01T14:19:25.635+05:30 ERROR 40699 --- [main] o.s.boot.SpringApplication : Application run failed

org.springframework.beans.factory.UnsatisfiedDependencyException: Error creating bean with name 'testController1': Unsatisfied dependency expressed th
```

Spring creates Request scope bean only when there is active HTTP request present. Since Singleton, is eagerly initialized, there is no active HTTP request present in current thread. So it wont create a bean for User.

```
@RestController
@Scope("singleton")
@RequestMapping(value = "/api/")
public class TestController1 {

    @Autowired
    User user;

    public TestController1() {
        System.out.println("TestController1 instance initialization");
    }

    @PostConstruct
    public void init() {
        System.out.println("TestController1 object hashCode: " + this.hashCode() +
            " User object hashCode: " + user.hashCode());
    }

    @GetMapping(path = "/fetchUser")
    public ResponseEntity<String> getUserDetails() {
        System.out.println("fetchUser api invoked");
        return ResponseEntity.status(HttpStatus.OK).body("");
    }
}
```

```
@Component
@Scope(value = "request", proxyMode = ScopedProxyMode.TARGET_CLASS)
public class User {

    public User() {
        System.out.println("User initialization");
    }

    @PostConstruct
    public void init(){
        System.out.println("User object hashCode: " + this.hashCode());
    }

    public void dummyMethod(){
    }
}
```

```

  ____  __
 / ___/  / /_  __  /_  __  /_  __
/ /   / / / /_  / /_  / /_  / /_
/_/   /_/ /_/ /_/ /_/ /_/ /_/ /_/

:: Spring Boot ::      (v3.2.3)

2024-05-01T15:16:24.864+05:30 INFO 43839 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:16:24.865+05:30 INFO 43839 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:16:25.318+05:30 INFO 43839 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T15:16:25.325+05:30 INFO 43839 --- [main] o.apache.catalina.core.StandardService
2024-05-01T15:16:25.325+05:30 INFO 43839 --- [main] o.apache.catalina.core.StandardEngine
2024-05-01T15:16:25.351+05:30 INFO 43839 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T15:16:25.352+05:30 INFO 43839 --- [main] w.s.c.ServletWebServerApplicationContext

TestController1 instance initialization
TestController1 object hashCode: 1356419559 User object hashCode: 1159352444
2024-05-01T15:16:25.534+05:30 INFO 43839 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T15:16:25.539+05:30 INFO 43839 --- [main] c.c.l.SpringbootApplication
```


 localhost:8090/api/fetchUser

```
2024-05-01T15:16:24.864+05:30 INFO 43839 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:16:24.865+05:30 INFO 43839 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:16:25.318+05:30 INFO 43839 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T15:16:25.325+05:30 INFO 43839 --- [main] o.apache.catalina.core.StandardService
2024-05-01T15:16:25.325+05:30 INFO 43839 --- [main] o.apache.catalina.core.StandardEngine
2024-05-01T15:16:25.351+05:30 INFO 43839 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T15:16:25.352+05:30 INFO 43839 --- [main] w.s.c.ServletWebServerApplicationContext
TestController1 instance initialization
TestController1 object hashCode: 1356419559 User object hashCode: 1159352444
2024-05-01T15:16:25.534+05:30 INFO 43839 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T15:16:25.539+05:30 INFO 43839 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:16:50.198+05:30 INFO 43839 --- [nio-8090-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T15:16:50.198+05:30 INFO 43839 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
2024-05-01T15:16:50.199+05:30 INFO 43839 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
fetchUser api invoked
User initialization
User object hashCode: 1078757370
```

Session:

- New Object is created for each HTTP session.
- Lazily initialized.
- When user accesses any endpoint, session is created.
- Remains active, till it does not expires.

```
@RestController
@Scope(value = "session")
@RequestMapping(value = "/api/")
public class TestController1 {

    @Autowired
    User user;

    public TestController1() {
        System.out.println("TestController1 instance initialization");
    }

    @PostConstruct
    public void init() {
        System.out.println("TestController1 object hashCode: " + this.hashCode() +
            " User object hashCode: " + user.hashCode());
    }

    @GetMapping(path = "/fetchUser")
    public ResponseEntity<String> getUserDetails() {
        System.out.println("fetchUser api invoked");
        return ResponseEntity.status(HttpStatus.OK).body("");
    }

    @GetMapping(path = "/logout")
    public ResponseEntity<String> getUserDetails(HttpServletRequest request) {
        System.out.println("end the session");
        HttpSession session = request.getSession();
        session.invalidate();
        return ResponseEntity.status(HttpStatus.OK).body("");
    }
}
```

```
@Component
public class User {

    public User() {
        System.out.println("User initialization");
    }

    @PostConstruct
    public void init(){
        System.out.println("User object hashCode: " + this.hashCode());
    }

    public void dummyMethod(){

    }
}
```

```
2024-05-01T15:37:03.271+05:30 INFO 46071 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:37:03.272+05:30 INFO 46071 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:37:03.710+05:30 INFO 46071 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T15:37:03.714+05:30 INFO 46071 --- [main] o.apache.catalina.core.StandardService
2024-05-01T15:37:03.714+05:30 INFO 46071 --- [main] o.apache.catalina.core.StandardEngine
2024-05-01T15:37:03.739+05:30 INFO 46071 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T15:37:03.740+05:30 INFO 46071 --- [main] w.s.c.ServletWebServerApplicationContext
User initialization
User object hashCode: 254812619
2024-05-01T15:37:03.928+05:30 INFO 46071 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T15:37:03.924+05:30 INFO 46071 --- [main] c.c.l.SpringbootApplication
```

1. localhost:8090/api/fetchUser

```
2024-05-01T15:37:03.271+05:30 INFO 46071 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:37:03.272+05:30 INFO 46071 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:37:03.710+05:30 INFO 46071 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T15:37:03.714+05:30 INFO 46071 --- [main] o.apache.catalina.core.StandardService
2024-05-01T15:37:03.714+05:30 INFO 46071 --- [main] o.apache.catalina.core.StandardEngine
2024-05-01T15:37:03.739+05:30 INFO 46071 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T15:37:03.740+05:30 INFO 46071 --- [main] w.s.c.ServletWebServerApplicationContext
User initialization
User object hashCode: 254812619
2024-05-01T15:37:03.928+05:30 INFO 46071 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T15:37:03.924+05:30 INFO 46071 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:37:26.050+05:30 INFO 46071 --- [nio-8090-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T15:37:26.051+05:30 INFO 46071 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
2024-05-01T15:37:26.051+05:30 INFO 46071 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
TestController1 instance initialization
TestController1 object hashCode: 1476370807 User object hashCode: 254812619
fetchUser api invoked
```

2. localhost:8090/api/fetchUser

```
2024-05-01T15:37:03.271+05:30 INFO 46071 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:37:03.272+05:30 INFO 46071 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:37:03.710+05:30 INFO 46071 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T15:37:03.714+05:30 INFO 46071 --- [main] o.apache.catalina.core.StandardService
2024-05-01T15:37:03.714+05:30 INFO 46071 --- [main] o.apache.catalina.core.StandardEngine
2024-05-01T15:37:03.739+05:30 INFO 46071 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T15:37:03.740+05:30 INFO 46071 --- [main] w.s.c.ServletWebServerApplicationContext
User initialization
User object hashCode: 254812619
2024-05-01T15:37:03.928+05:30 INFO 46071 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T15:37:03.924+05:30 INFO 46071 --- [main] c.c.l.SpringbootApplication
2024-05-01T15:37:26.050+05:30 INFO 46071 --- [nio-8090-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T15:37:26.051+05:30 INFO 46071 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
2024-05-01T15:37:26.051+05:30 INFO 46071 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
TestController1 instance initialization
TestController1 object hashCode: 1476370807 User object hashCode: 254812619
fetchUser api invoked
fetchUser api invoked
```

3. localhost:8090/api/logout

```
2024-05-01T17:46:42.430+05:30 INFO 52913 --- [main] w.s.c.ServletWebServerApplicationContext
User initialization
User object hashCode: 254812619
2024-05-01T17:46:42.585+05:30 INFO 52913 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T17:46:42.590+05:30 INFO 52913 --- [main] c.c.l.SpringbootApplication
2024-05-01T17:46:47.076+05:30 INFO 52913 --- [nio-8090-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T17:46:47.076+05:30 INFO 52913 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
2024-05-01T17:46:47.077+05:30 INFO 52913 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
TestController1 instance initialization
TestController1 object hashCode: 406833946 User object hashCode: 254812619
fetchUser api invoked
fetchUser api invoked
end the session
```

4. localhost:8090/api/fetchUser

```
2024-05-01T17:46:42.402+05:30 INFO 52913 --- [main] o.apache.catalina.core.StandardEngine
2024-05-01T17:46:42.429+05:30 INFO 52913 --- [main] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T17:46:42.430+05:30 INFO 52913 --- [main] w.s.c.ServletWebServerApplicationContext
User initialization
User object hashCode: 254812619
2024-05-01T17:46:42.585+05:30 INFO 52913 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer
2024-05-01T17:46:42.590+05:30 INFO 52913 --- [main] c.c.l.SpringbootApplication
2024-05-01T17:46:47.076+05:30 INFO 52913 --- [nio-8090-exec-1] o.a.c.c.C.[Tomcat].[localhost].[/]
2024-05-01T17:46:47.076+05:30 INFO 52913 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
2024-05-01T17:46:47.077+05:30 INFO 52913 --- [nio-8090-exec-1] o.s.web.servlet.DispatcherServlet
TestController1 instance initialization
TestController1 object hashCode: 406833946 User object hashCode: 254812619
fetchUser api invoked
fetchUser api invoked
end the session
TestController1 instance initialization
TestController1 object hashCode: 754846954 User object hashCode: 254812619
fetchUser api invoked
```