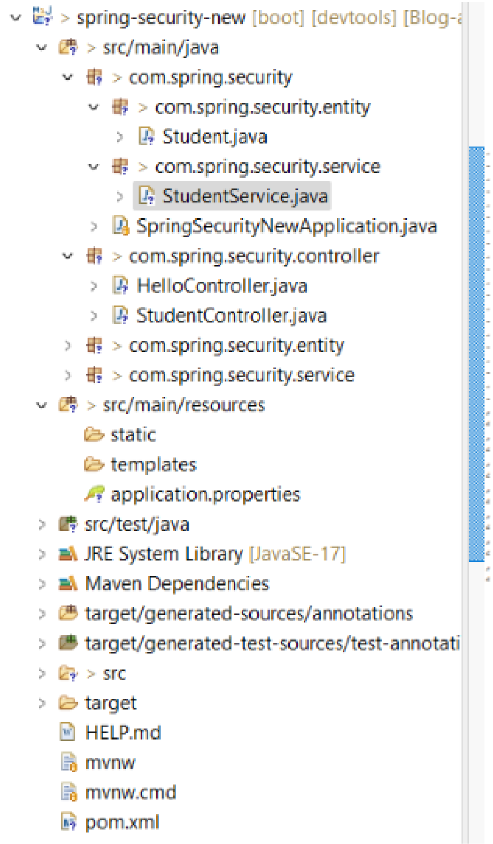
Error Without CSRF Token

- **Understanding CSRF (Cross-Site Request Forgery)**: CSRF is a type of attack that tricks the user into executing unwanted actions on a web application where they are authenticated. CSRF tokens are used to prevent such attacks by adding an extra layer of verification.
- **Error Without CSRF Token**:
  - When trying to make a POST, PUT, DELETE, or any state-changing request without a CSRF token, the server may respond with a 403 Forbidden error indicating a missing or invalid CSRF token.
  - This happens because CSRF protection is enabled by default in Spring Security for non-GET requests.

Project Structure:



```
> spring-security-new [boot] [devtools] [Blog-a
  > src/main/java
    > com.spring.security
      > com.spring.security.entity
          Student.java
      > com.spring.security.service
          StudentService.java
        SpringSecurityNewApplication.java
    > com.spring.security.controller
        HelloController.java
        StudentController.java
    > com.spring.security.entity
    > com.spring.security.service
  > src/main/resources
      static
      templates
      application.properties
  src/test/java
  JRE System Library [JavaSE-17]
  Maven Dependencies
  target/generated-sources/annotations
  target/generated-test-sources/test-annotati
  > src
  target
  HELP.md
  mvnw
  mvnw.cmd
  pom.xml
```

login.html

login page :

```
<!DOCTYPE html>
<html lang="en">
 <head>
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
  <meta name="description" content="">
  <meta name="author" content="">
  <title>Please sign in</title>
  <link href="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0-beta/css/bootstrap.min.css"
        rel="stylesheet" integrity="sha384-
       /Y6pD6FV/Vv2HJnA6t+vslU6fwYXjCFtcEpHbNJ0lyAFsXTsjBbfaDjzALeQsN6M"
       crossorigin="anonymous">
  <link href="https://getbootstrap.com/docs/4.0/examples/signin/signin.css" rel="stylesheet"
       integrity="sha384-
       oOE/3m0LUMPub4kaC09mrdEhIc+e3exm4xOGxAmuFXhBNF4hcg/6MiAXAf5p0P5
       6" crossorigin="anonymous"/>
 </head>
 <body>
   <div class="container">
    <form class="form-signin" method="post" action="/login">
      <h2 class="form-signin-heading">Please sign in</h2>
      <div class="alert alert-success" role="alert">You have been signed out</div>
       <p>
        <label for="username" class="sr-only">Username</label>
        <input type="text" id="username" name="username" class="form-control"
           placeholder="Username" required autofocus>
      </p>
      <p>
        <label for="password" class="sr-only">Password</label>
        <input type="password" id="password" name="password" class="form-control"
            placeholder="Password" required>
      </p>
     <input name="_csrf" type="hidden"
       value="YxSzD99jndn06qhYNArI_UR0lYnZgdkkSZApPGiutUQZ9SdgUSXQPrtVq-
       zZ05hgDSf8ySJNuOu94-kJf_UeBV6ehXwpxhRV" />
      <button class="btn btn-lg btn-primary btn-block" type="submit">Sign in</button>
    </form>
  </div>
 </body>
</html>
```

logout.html

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no">
    <meta name="description" content="">
    <meta name="author" content="">
    <title>Confirm Log Out?</title>
    <link href="https://maxcdn.bootstrapcdn.com/bootstrap/4.0.0-beta/css/bootstrap.min.css"
            'rel="stylesheet" integrity="sha384-
            /Y6pD6FV/Vv2HJnA6t+vslU6fwYXjCFtcEpHbNJ0lyAFsXTsjBbfaDjzALeQsN6M"
            crossorigin="anonymous">
   <link href="https://getbootstrap.com/docs/4.0/examples/signin/signin.css" rel="stylesheet"
            integrity="sha384-
            oOE/3m0LUMPub4kaC09mrdEhIc+e3exm4xOGxAmuFXhBNF4hcg/6MiAXAf5p0P5
            6" crossorigin="anonymous"/>
  </head>
  <body>
     <div class="container">
      <form class="form-signin" method="post" action="/logout">
        <h2 class="form-signin-heading">Are you sure you want to log out?</h2>
        <input name="_csrf" type="hidden" value="C-yWbXKOzTA1L-
            20Fnf48Gi4C4T0s9cHoVX-l-
            vTtY7s_uXjP9z1DhTs9QAYS97VJlrMw1jbJryV0LMqlzGYro21gb_bm9fQ" />
        <button class="btn btn-lg btn-primary btn-block" type="submit">Log Out</button>
      </form>
    </div>
  </body>
</html>
```

StudentController.java

```
@RestController
public class StudentController {

        @Autowired
        private StudentService studentService;


        @GetMapping("/students")
        public ResponseEntity<List<Student>> getStudents(){

           return ResponseEntity.ok(studentService.getStudents());

        }

        @PostMapping("/students")
        public ResponseEntity<Student> addStudent(@RequestBody Student student ){
            if(studentService.addStudent(student)) {
                 return ResponseEntity.ok(student);
             }else {
                 return ResponseEntity.internalServerError().build();
             }
        }
}
```

StudentService.java

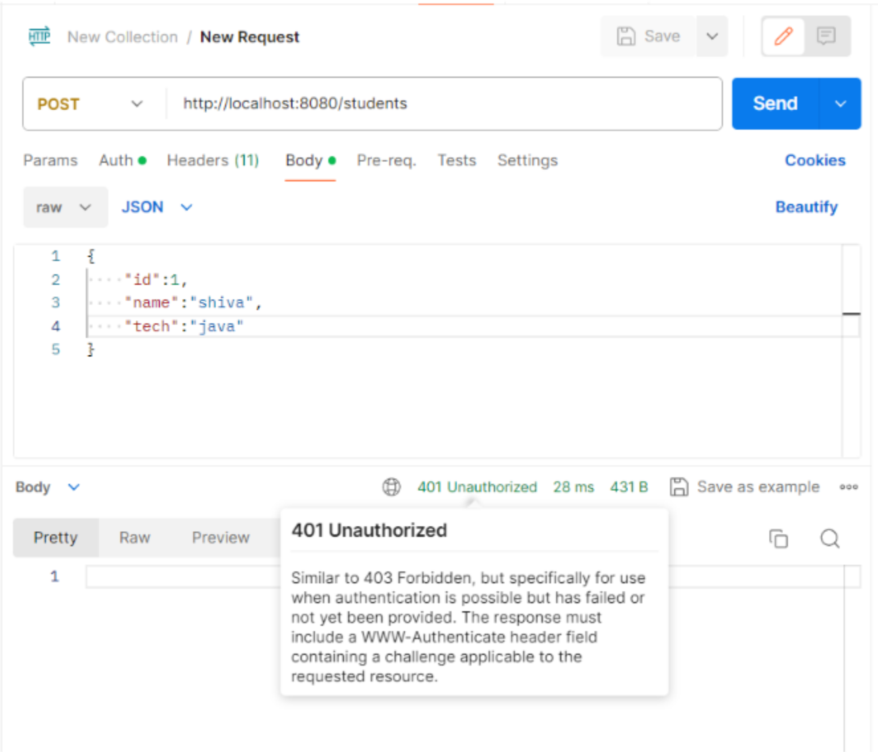
```
@Service
public class StudentService {

        private static List<Student> students=new ArrayList<>(List.of(
                        new Student(1,"Shiva","Java"),
                        new Student(2,"Muskan","Python")
                        ));

        public List<Student> getStudents(){
                return students;
        }

        public boolean addStudent(Student student) {
                return students.add(student);
        }
}
```

Student.java

```
package com.spring.security.entity;

import lombok.AllArgsConstructor;
import lombok.Data;
import lombok.NoArgsConstructor;

@Data
@NoArgsConstructor
@AllArgsConstructor
public class Student {

	private int id;
	private String name;
	private String tech;

}
```

Without token:

For POST method:



http://localhost:8080/students

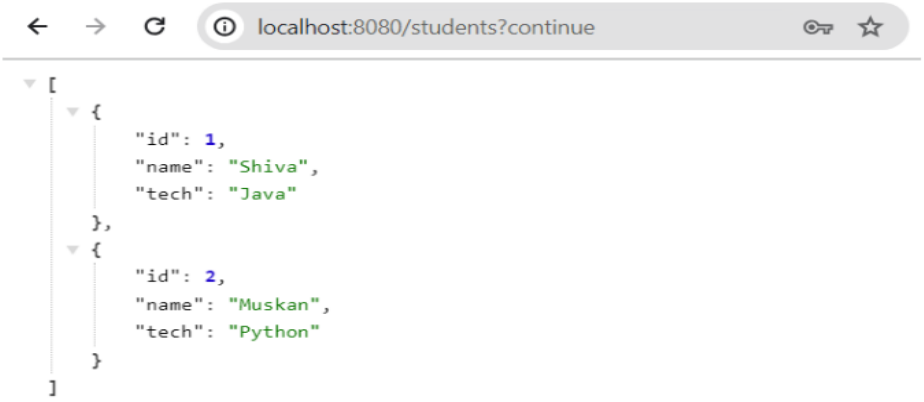
```
{
    "id":1,
    "name":"shiva",
    "tech":"java"
}
```

401 Unauthorized 28 ms 431 B

401 Unauthorized

Similar to 403 Forbidden, but specifically for use when authentication is possible but has failed or not yet been provided. The response must include a WWW-Authenticate header field containing a challenge applicable to the requested resource.

For GET method:



```
[
  {
    "id": 1,
    "name": "Shiva",
    "tech": "Java"
  },
  {
    "id": 2,
    "name": "Muskan",
    "tech": "Python"
  }
]
```

Browser

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