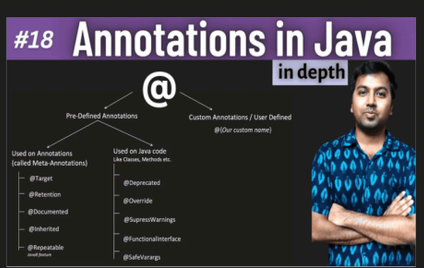
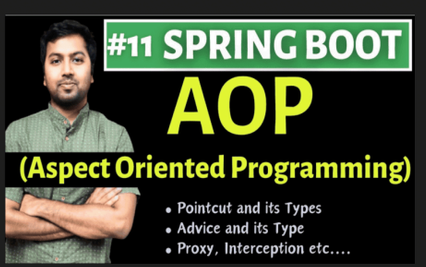
Interceptor:
it's a mediator, which get invoked before or after your actual code.

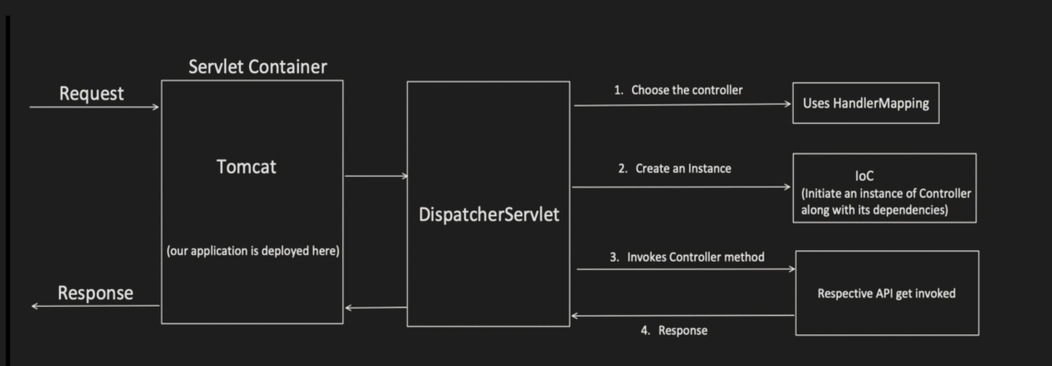
In future topics below, we might need to write our custom interceptors:
- *Springboot Caching,*
- *Springboot logging,*
- *Springboot Authentication etc..*

Pre-requisite to understand custom interceptor better:





Custom Interceptor for Requests before even reaching to specific Controller class



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

    @Autowired
    User user;

    @GetMapping(path = "/getUser")
    public String getUser() {
        user.getUser();
        return "success";
    }
}
```

```java
@Component
public class MyCustomInterceptor implements HandlerInterceptor {

    @Override
    public boolean preHandle(HttpServletRequest request, HttpServletResponse response, Object handler) throws Exception {
        System.out.println("inside pre handle Method");
        return true;
    }

    @Override
    public void postHandle(HttpServletRequest request, HttpServletResponse response, Object handler, @Nullable ModelAndView modelAndView) throws Exception {
        System.out.println("inside post handle method");

    }

    @Override
    public void afterCompletion(HttpServletRequest request, HttpServletResponse response, Object handler, @Nullable Exception ex) throws Exception {
        System.out.println("inside after completion method");
    }
}
```

```java
@Configuration
public class AppConfig implements WebMvcConfigurer {

    @Autowired
    MyCustomInterceptor myCustomInterceptor;

    @Override
    public void addInterceptors(InterceptorRegistry registry) {
        registry.addInterceptor(myCustomInterceptor)
                .addPathPatterns("/api/*") // Apply to these URL patterns
                .excludePathPatterns("/api/updateUser", "/api/deleteUser"); // Exclude for these URL patterns
    }
}
```

http://localhost:8080/api/getUser

```
2024-08-31T23:01:49.217+05:30  INFO 4417 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet        : Completed initialization in 0 ms
inside pre handle Method
hitting db to get the userdata
inside post handle method
inside after completion method
```

Custom Interceptor for Requests after reaching to specific Controller class

Step1: Creation of custom annotation

We can create Custom Annotation using keyword *"@interface"* java Annotation.

```java
public @interface MyCustomAnnotation {
}
```

```java
public class User {

    @MyCustomAnnotation
    public void updateUser(){
        //some business logic
    }
}
```

2 Important Meta Annotation properties are:

- @Target :
  this meta annotation, tells where we can apply the particular annotation on method or class or constructor etc.

```java
@Target(ElementType.METHOD)
public @interface MyCustomAnnotation {
}
```

```java
@Target({ElementType.CONSTRUCTOR, ElementType.METHOD, ElementType.PARAMETER, ElementType.FIELD})
public @interface MyCustomAnnotation {
}
```

@Retention:
this meta annotation tell, how the particular annotation will be stored in java.

- RetentionPolicy.*SOURCE :*
  Annotation will be discarded by compiler itself and its not even recorded in .class file.

  RetentionPolicy.*CLASS :*
  Annotation will be recorded in .class file but ignored by JVM during run time.

  RetentionPolicy.*RUNTIME :*
  Annotation will be recorded in .class file and also available during run time.

```java
@Target({ElementType.METHOD})
@Retention(RetentionPolicy.SOURCE)
public @interface MyCustomAnnotation {
}
```

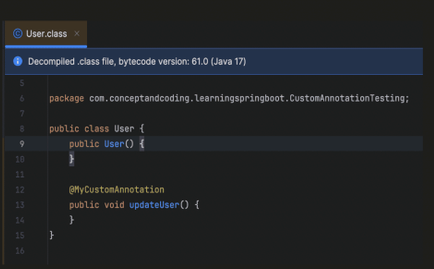
```java
public class User {

    @MyCustomAnnotation
    public void updateUser(){
        //some business logic
    }
}
```


```java
@Target(ElementType.METHOD)
@Retention(RetentionPolicy.RUNTIME)
public @interface MyCustomAnnotation {
}
```

```java
public class User {

    @MyCustomAnnotation
    public void updateUser(){
        //some business logic
    }
}
```



How to create Custom Annotation with methods (more like a fields):

- No parameter, no body
- Return type is restricted to:
  - Primitive type (int, boolean, double etc.)
  - String
  - Enum
  - Class<?>
  - Annotations
  - Array of above types

```java
@Target(ElementType.METHOD)
@Retention(RetentionPolicy.RUNTIME)
public @interface MyCustomAnnotation {

    String key() default "defaultKeyName";
}
```

```java
public class User {

    @MyCustomAnnotation(key = "userKey")
    public void updateUser(){
        //some business logic
    }
}
```

```java
@Target(ElementType.METHOD)
@Retention(RetentionPolicy.RUNTIME)
public @interface MyCustomAnnotation {

    int intKey() default 0;

    String stringKey() default "defaultString";

    Class<?> classTypeKey() default String.class;

    MyCustomEnum enumKey() default MyCustomEnum.ENUM_VAL1;

    String[] stringArrayKey() default {"default1", "default2"};

    int[] intArrayKey() default {1, 2};

}
```

```java
public class User {

    @MyCustomAnnotation(intKey = 10, stringKey = "user", classTypeKey = User.class, enumKey = MyCustomEnum.ENUM_VAL2)
    public void updateUser(){
        //some business logic
    }
}
```

Step2: Creation of Custom Interceptor

```java
@Target({ElementType.METHOD})
@Retention(RetentionPolicy.RUNTIME)
public @interface MyCustomAnnotation {

    String name() default "";

}
```

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

    @Autowired
    User user;

    @GetMapping(path = "/getUser")
    public String getUser(){
        user.getUser();
        return "success";
    }
}
```

```java
@Component
public class User {

    @MyCustomAnnotation(name = "user")
    public void getUser() {
        System.out.println("get the user details");
    }
}
```

```java
@Component
@Aspect
public class MyCustomInterceptor {

    @Around("@annotation(com.conceptandcoding.learningspringboot.CustomInterceptor.MyCustomAnnotation)") //pointcut expression
    public void invoke(ProceedingJoinPoint joinPoint) throws Throwable{ //advice

        System.out.println("do something before actual method");

        Method method = ((MethodSignature)joinPoint.getSignature()).getMethod();
        if(method.isAnnotationPresent(MyCustomAnnotation.class)){
            MyCustomAnnotation annotation = method.getAnnotation(MyCustomAnnotation.class);
            System.out.println("name from annotation: " + annotation.name());
        }

        joinPoint.proceed();
        System.out.println("do something after actual method");
    }
}
```

Output:

```
2024-08-31T17:51:51.344+05:30  INFO 3464 --- [nio-8080-exec-1] o.s.web.servlet.DispatcherServlet        : Completed initialization in 0 ms
do something before actual method
name from annotation: user
get the user details
do something after actual method
```