Design Patterns in Blockchain-Based-ML-Deployment
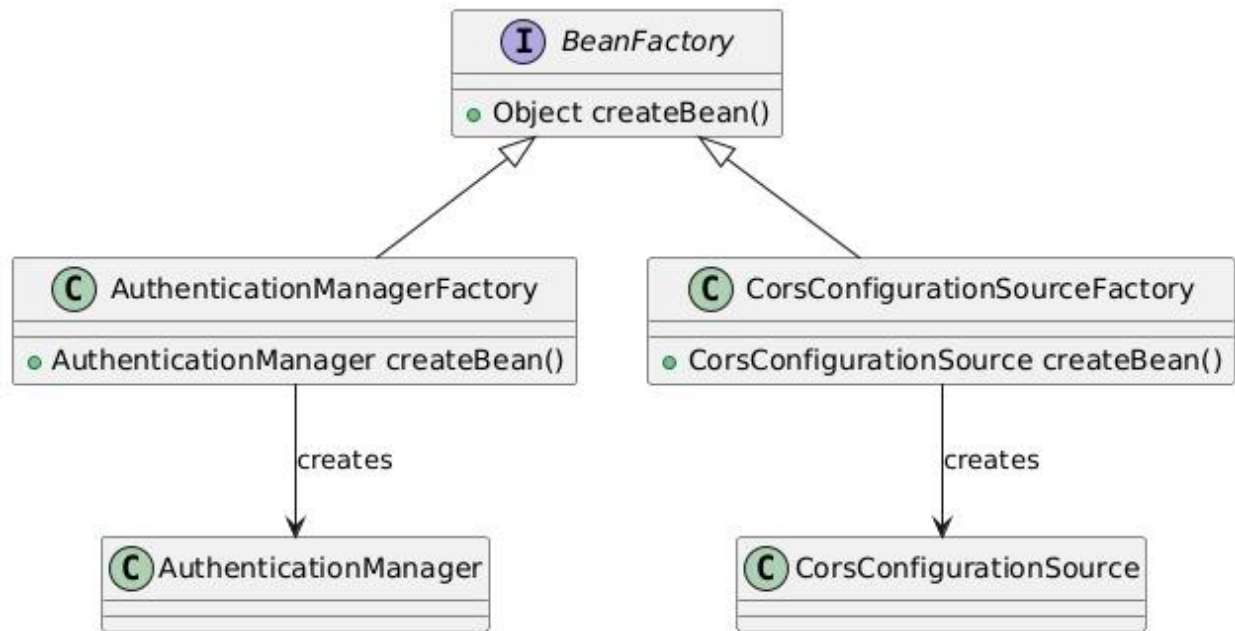
Class Diagram

Singleton Pattern
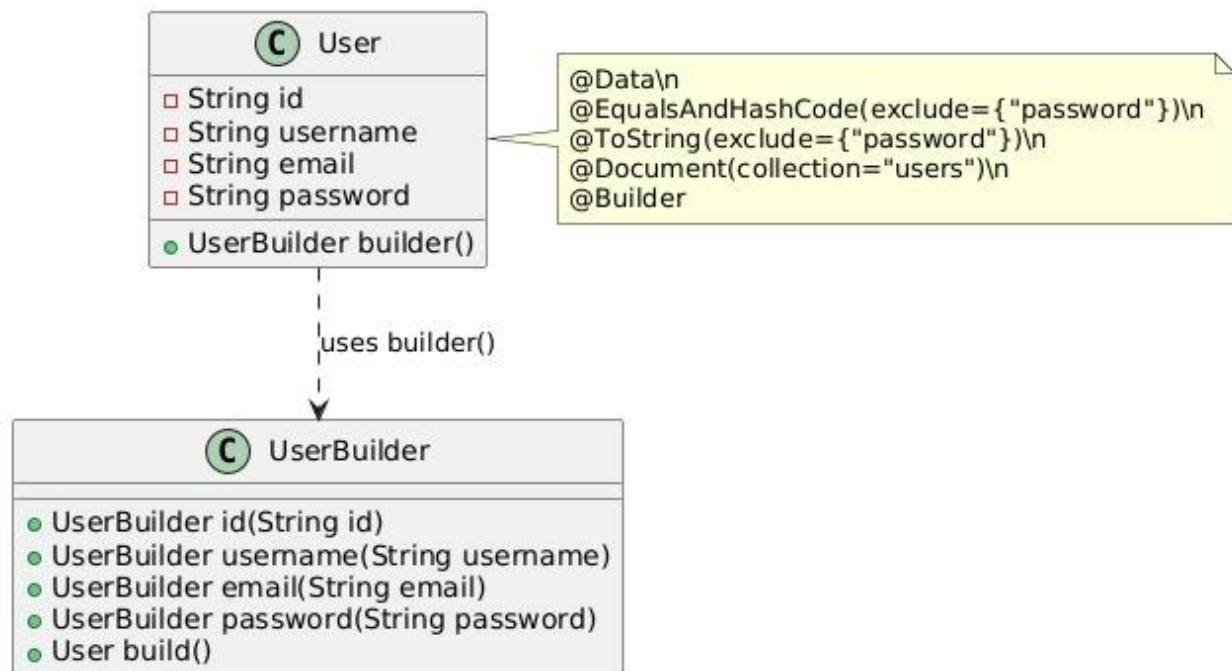

Singleton Pattern in Spring (Bean Scope)
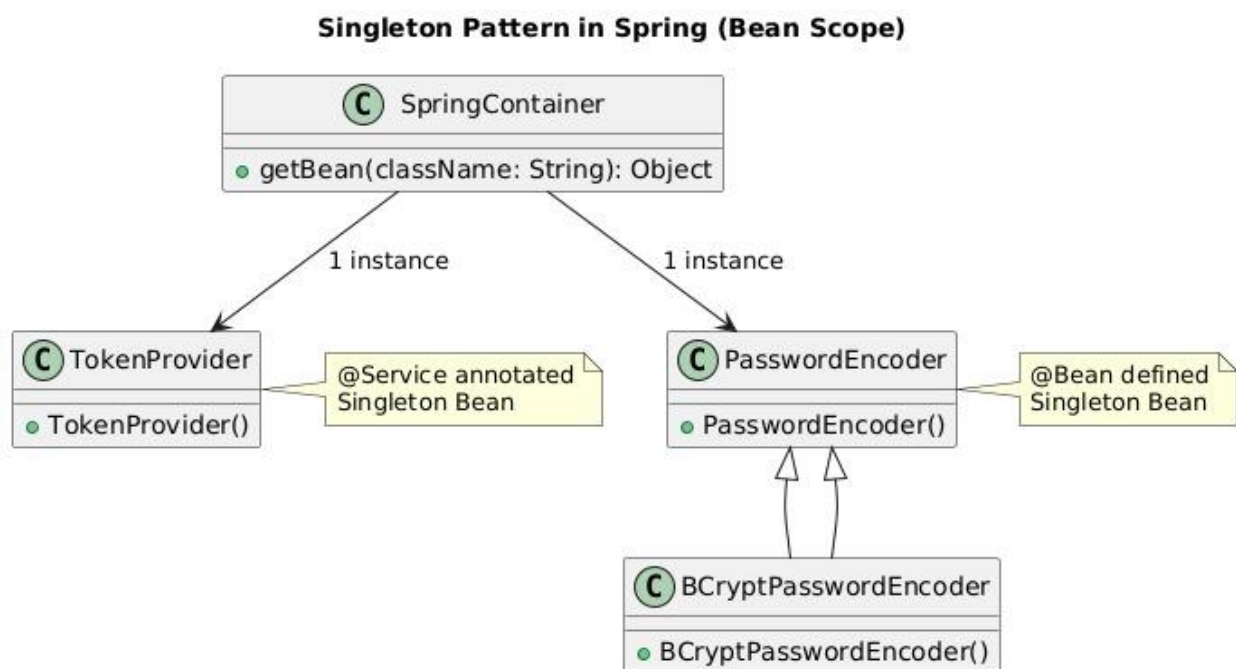
Factory Pattern

Spring Factory Pattern for Bean Creation

```
                    ┌─────────────────────────┐
                    │  (I)  BeanFactory        │
                    ├─────────────────────────┤
                    │  ● Object createBean()   │
                    └─────────────────────────┘
                         △              △
              ┌──────────┘              └──────────┐
┌────────────────────────────────────┐  ┌────────────────────────────────────────┐
│ (C) AuthenticationManagerFactory   │  │ (C) CorsConfigurationSourceFactory      │
├────────────────────────────────────┤  ├────────────────────────────────────────┤
│ ● AuthenticationManager createBean()│  │ ● CorsConfigurationSource createBean()  │
└────────────────────────────────────┘  └────────────────────────────────────────┘
                │                                        │
              creates                                 creates
                ▼                                        ▼
┌────────────────────────────────┐        ┌────────────────────────────────────┐
│ (C) AuthenticationManager      │        │ (C) CorsConfigurationSource         │
├────────────────────────────────┤        ├────────────────────────────────────┤
│                                │        │                                     │
└────────────────────────────────┘        └────────────────────────────────────┘
```

Builder Pattern (via Lombok)

Builder Pattern using Lombok

C User
- □ String id
- □ String username
- □ String email
- □ String password
- ● UserBuilder builder()

@Data\n
@EqualsAndHashCode(exclude={"password"})\n
@ToString(exclude={"password"})\n
@Document(collection="users")\n
@Builder

uses builder()

C UserBuilder
- ● UserBuilder id(String id)
- ● UserBuilder username(String username)
- ● UserBuilder email(String email)
- ● UserBuilder password(String password)
- ● User build()

Facade Pattern

Facade Pattern in Spring Service (UserService)

C UserService
● updateProfile(currentUser: UserPrincipal, request: ProfileUpdateRequest) : User ● otherMethods()

uses   uses   returns

C UserPrincipal		C ProfileUpdateRequest		C User
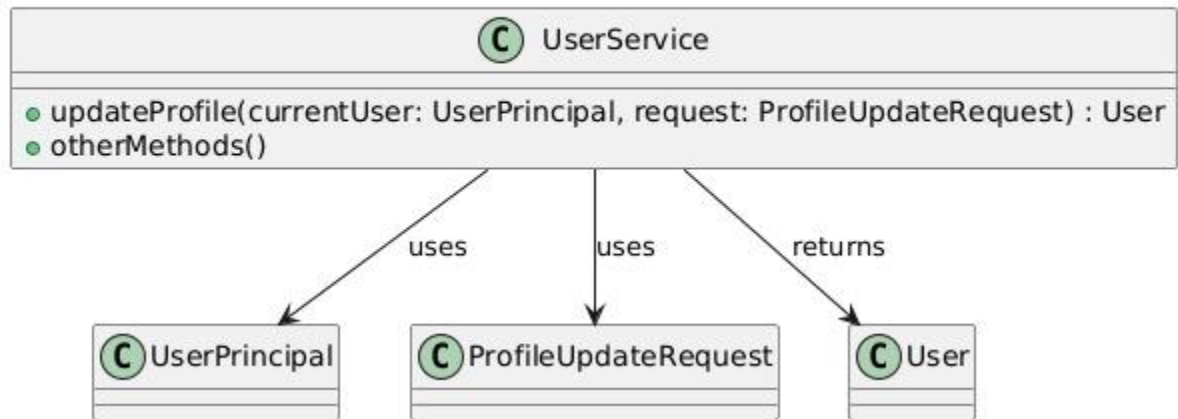
Adapter Pattern

Adapter Pattern in Spring Security (CustomUserDetailsService)