

In this exercise, you'll implement a generic repository pattern

1. BaseEntity - abstract class

- Attributes
 - 0. id: int
 - 1. created: Date (java.util)
- Methods
 - 0. Constructor that takes id as parameter. and assign new date object to "created" field.
 - 1. getId(): int and getCreated():Date

2. User - child of BaseEntity

- Attributes
 - 0. username: String
 - 1. email: String
- Methods
 - 0. Constructor that takes id, username and email.
 - 1. getUsername(): String and setUsername(username:String)
 - 2. getEmail(): String and setEmail(email:String)
 - 3. toString():String (returns a string in format:

"User [email=" + email + ", username=" + username + "];"

3. Role - child of BaseEntity

- Attributes
 - 0. name: String
- Methods
 - 0. Constructor that takes id and name
 - 1. getName(): String and setName(name: string)
 - 2. toString(): String (returns a string in format:

"Role [name=" + name + "]"

4. **IGenericRepository<T extends BaseEntity>** - Generic interface. T is child of BaseEntity
 - Methods
 0. add(element: T): void
 0. adds element to data source
 1. if datasource already contains an element with same id throws RuntimeException.
 1. get(id: int) : T
 0. returns the element with specified id.
 2. remove(id: int): void
 0. removes the element with specified id.
 3. update(element: T) : void
 0. updates the element in datasource
 1. if there is no element in data source with same id throws RuntimeException
 4. count(): int
 0. returns the total number of records in datasoruce.
5. **GenericRepository<T extends BaseEntity>** - abstract class and implements IGenericRepository<T>
 - Attributes
 0. dataSource : a Collection (Map or Set)
6. **IUserRepository** - interface extended from IGenericRepository with User type.
 - Methods
 0. getByEmail(email: String): User
 0. returns the user with specified email
 1. if there is no user associated with email throws RuntimeException
7. **UserRepository** - extends GenericRepository with User type and implements IUserRepository
8. **IRoleRepository** - interface extended from IGenericRepository with Role type
 - Methods
 0. getByName(name: String): Role
 0. returns the role with specified name
 1. if there is no role associated with name throws RuntimeException
9. **RoleRepository** - extends GenericRepository with Role type and implements IRoleRepository.