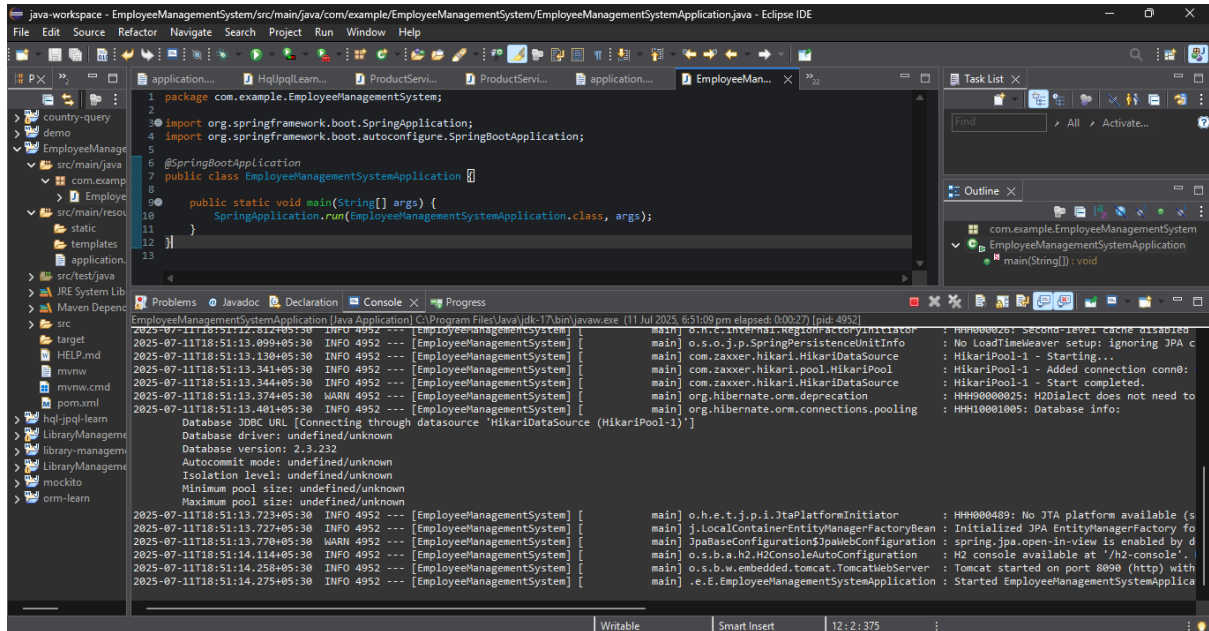


Spring Data JPA and Hibernate

Exercise 1: Employee Management System - Overview and Setup

Output:



```
1 package com.example.EmployeeManagementSystem;
2
3 import org.springframework.boot.SpringApplication;
4 import org.springframework.boot.autoconfigure.SpringBootApplication;
5
6 @SpringBootApplication
7 public class EmployeeManagementSystemApplication {
8
9     public static void main(String[] args) {
10         SpringApplication.run(EmployeeManagementSystemApplication.class, args);
11     }
12 }
13
```

EmployeeManagementSystemApplication [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (11 Jul 2025, 6:51:09 pm elapsed: 0:00:27) [pid: 4952]

2025-07-11T18:51:13.099+05:30 INFO 4952 --- [EmployeeManagementSystem] [main] o.s.o.j.p.SpringPersistenceUnitInfo : No LoadTimeWeaver setup; ignoring JPA class loader

2025-07-11T18:51:13.130+05:30 INFO 4952 --- [EmployeeManagementSystem] [main] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Starting...

2025-07-11T18:51:13.341+05:30 INFO 4952 --- [EmployeeManagementSystem] [main] com.zaxxer.hikari.pool.HikariPool : HikariPool-1 - Added connection conn0:

2025-07-11T18:51:13.344+05:30 INFO 4952 --- [EmployeeManagementSystem] [main] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Start completed.

2025-07-11T18:51:13.374+05:30 WARN 4952 --- [EmployeeManagementSystem] [main] org.hibernate.orm.deprecation : HHH00000025: H2Dialect does not need to

2025-07-11T18:51:13.401+05:30 INFO 4952 --- [EmployeeManagementSystem] [main] org.hibernate.orm.connections.pooling : HHH10001005: Database Info:

Database JDBC URL [Connecting through datasource 'HikariDataSource (HikariPool-1)']

Database driver: undefined/unknown

Database version: 2.3.232

Autocommit mode: undefined/unknown

Isolation level: undefined/unknown

Minimum pool size: undefined/unknown

Maximum pool size: undefined/unknown

2025-07-11T18:51:13.723+05:30 INFO 4952 --- [EmployeeManagementSystem] [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH000489: No JTA platform available (s

2025-07-11T18:51:13.727+05:30 INFO 4952 --- [EmployeeManagementSystem] [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory fo

2025-07-11T18:51:13.770+05:30 WARN 4952 --- [EmployeeManagementSystem] [main] JpaBaseConfiguration\$JpaWebConfiguration : spring.jpa.open-in-view is enabled by d

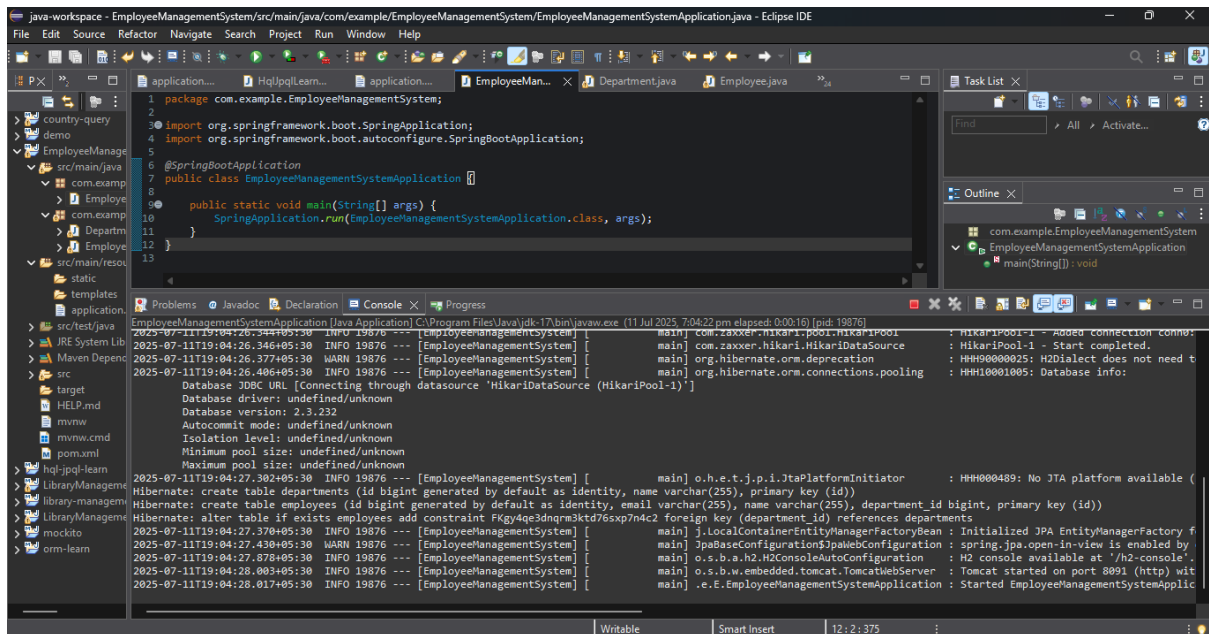
2025-07-11T18:51:14.114+05:30 INFO 4952 --- [EmployeeManagementSystem] [main] o.s.b.a.h2.H2ConsoleAutoConfiguration : H2 console available at '/h2-console'.

2025-07-11T18:51:14.258+05:30 INFO 4952 --- [EmployeeManagementSystem] [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8090 (http) with

2025-07-11T18:51:14.275+05:30 INFO 4952 --- [EmployeeManagementSystem] [main] .e.E.EmployeeManagementSystemApplication : Started EmployeeManagementSystemApplica

Exercise 2: Employee Management System - Creating Entities

Output:



```
1 package com.example.EmployeeManagementSystem;
2
3 import org.springframework.boot.SpringApplication;
4 import org.springframework.boot.autoconfigure.SpringBootApplication;
5
6 @SpringBootApplication
7 public class EmployeeManagementSystemApplication {
8
9     public static void main(String[] args) {
10         SpringApplication.run(EmployeeManagementSystemApplication.class, args);
11     }
12 }
13
```

EmployeeManagementSystemApplication [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (11 Jul 2025, 7:04:22 pm elapsed: 0:00:16) [pid: 19876]

2025-07-11T19:04:26.344+05:30 INFO 19876 --- [EmployeeManagementSystem] [main] com.zaxxer.hikari.pool.HikariPool : HikariPool-1 - Added connection conn0:

2025-07-11T19:04:26.346+05:30 INFO 19876 --- [EmployeeManagementSystem] [main] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Start completed.

2025-07-11T19:04:26.377+05:30 WARN 19876 --- [EmployeeManagementSystem] [main] org.hibernate.orm.deprecation : HHH00000025: H2Dialect does not need t

2025-07-11T19:04:26.406+05:30 INFO 19876 --- [EmployeeManagementSystem] [main] org.hibernate.orm.connections.pooling : HHH10001005: Database Info:

Database JDBC URL [Connecting through datasource 'HikariDataSource (HikariPool-1)']

Database driver: undefined/unknown

Database version: 2.3.232

Autocommit mode: undefined/unknown

Isolation level: undefined/unknown

Minimum pool size: undefined/unknown

Maximum pool size: undefined/unknown

2025-07-11T19:04:27.302+05:30 INFO 19876 --- [EmployeeManagementSystem] [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH000489: No JTA platform available (

2025-07-11T19:04:27.304+05:30 INFO 19876 --- [EmployeeManagementSystem] [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory f

2025-07-11T19:04:27.306+05:30 INFO 19876 --- [EmployeeManagementSystem] [main] JpaBaseConfiguration\$JpaWebConfiguration : spring.jpa.open-in-view is enabled by

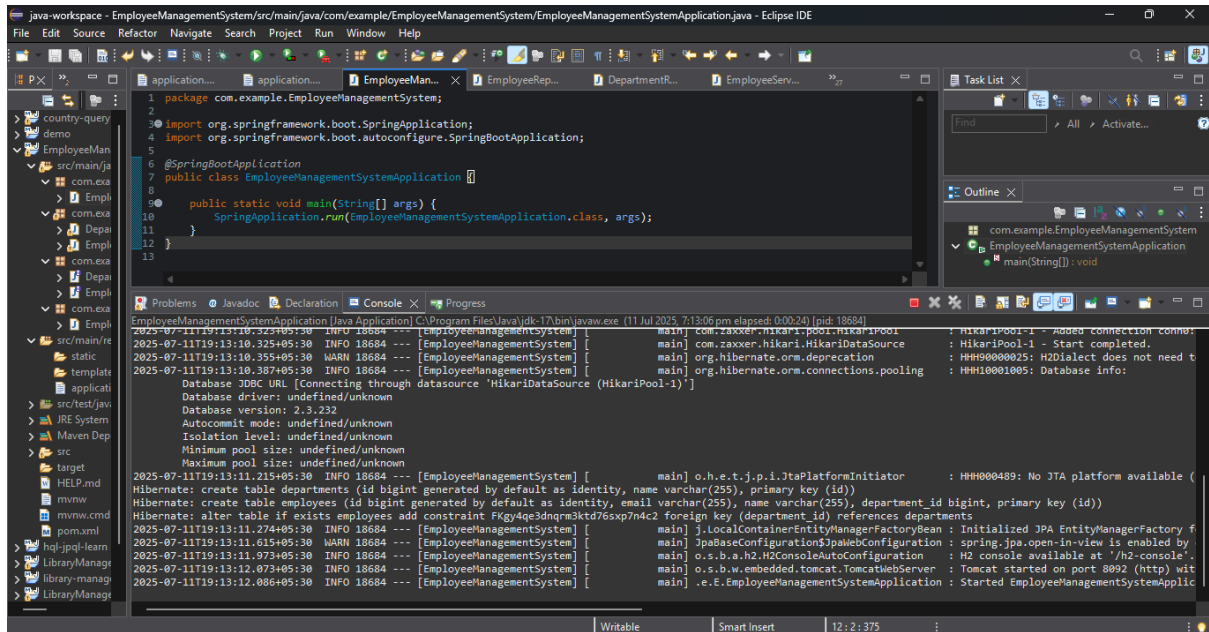
2025-07-11T19:04:27.378+05:30 INFO 19876 --- [EmployeeManagementSystem] [main] o.s.b.a.h2.H2ConsoleAutoConfiguration : H2 console available at '/h2-console'.

2025-07-11T19:04:28.003+05:30 INFO 19876 --- [EmployeeManagementSystem] [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8091 (http) wit

2025-07-11T19:04:28.017+05:30 INFO 19876 --- [EmployeeManagementSystem] [main] .e.E.EmployeeManagementSystemApplication : Started EmployeeManagementSystemApplic

Exercise 3: Employee Management System - Creating Repositories

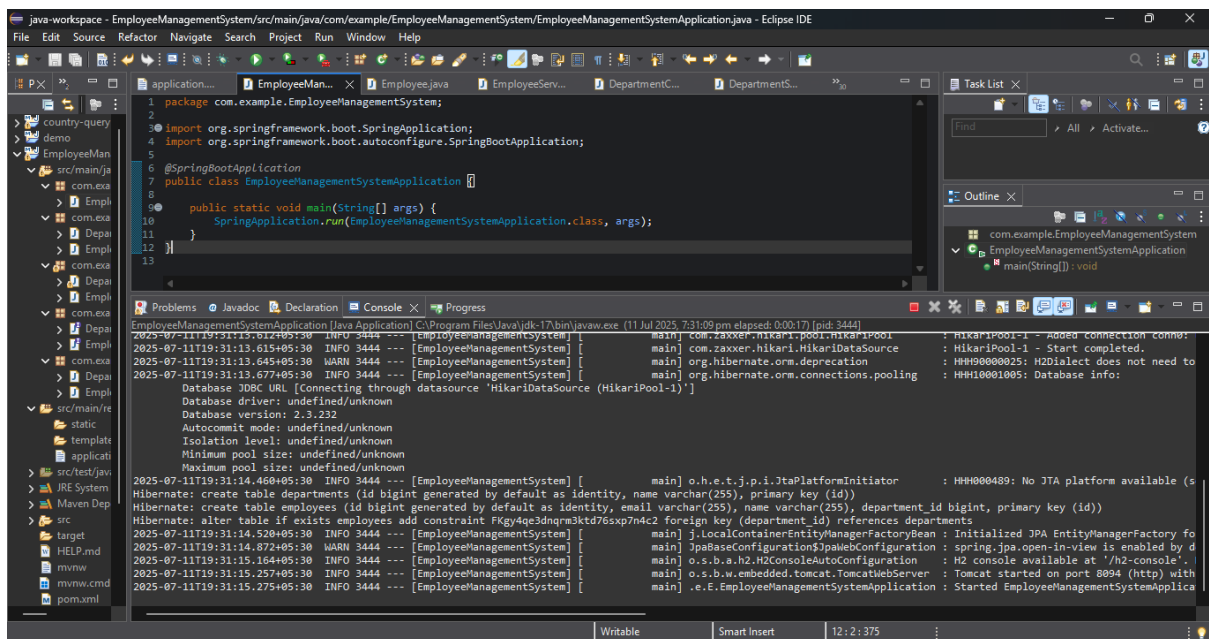
Output:



```
EmployeeManagementSystemApplication [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (11 Jul 2025, 7:13:06 pm elapsed: 0:00:24) [pid: 18684]
2025-07-11T19:13:10.325+05:30 INFO 18684 --- [EmployeeManagementSystem] [main] com.zaxxer.hikari.pool.HikariPool : HikariPool-1 - Added connection connor:
2025-07-11T19:13:10.325+05:30 INFO 18684 --- [EmployeeManagementSystem] [main] com.zaxxer.hikari.pool.HikariPool : HikariPool-1 - Start completed.
2025-07-11T19:13:10.355+05:30 WARN 18684 --- [EmployeeManagementSystem] [main] org.hibernate.orm.deprecation : HHH90000025: H2Dialect does not need to
2025-07-11T19:13:10.387+05:30 INFO 18684 --- [EmployeeManagementSystem] [main] org.hibernate.orm.connections.pooling : HHH10001005: Database info:
Database JDBC URL [Connecting through datasource 'HikariDataSource (HikariPool-1)']
Database driver: undefined/unknown
Database version: 2.3.232
Autocommit mode: undefined/unknown
Isolation level: undefined/unknown
Minimum pool size: undefined/unknown
Maximum pool size: undefined/unknown
2025-07-11T19:13:11.215+05:30 INFO 18684 --- [EmployeeManagementSystem] [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH000489: No JTA platform available (
Hibernate: create table departments (id bigint generated by default as identity, name varchar(255), primary key (id))
Hibernate: create table employees (id bigint generated by default as identity, email varchar(255), name varchar(255), department_id bigint, primary key (id))
Hibernate: alter table if exists employees add constraint FKgy4qe3dnqrm3ktd76sxp7n4c2 foreign key (department_id) references departments
2025-07-11T19:13:11.274+05:30 INFO 18684 --- [EmployeeManagementSystem] [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory fo
2025-07-11T19:13:11.615+05:30 WARN 18684 --- [EmployeeManagementSystem] [main] jpaBaseConfiguration$JpaWebConfiguration : spring.jpa.open-in-view is enabled by
2025-07-11T19:13:11.973+05:30 INFO 18684 --- [EmployeeManagementSystem] [main] o.s.b.a.h2.H2ConsoleAutoConfiguration : H2 console available at '/h2-console'.
2025-07-11T19:13:12.073+05:30 INFO 18684 --- [EmployeeManagementSystem] [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8092 (http) wit
2025-07-11T19:13:12.086+05:30 INFO 18684 --- [EmployeeManagementSystem] [main] .e.E.EmployeeManagementSystemApplication : Started EmployeeManagementSystemApplic
```

Exercise 4: Employee Management System - Implementing CRUD Operations

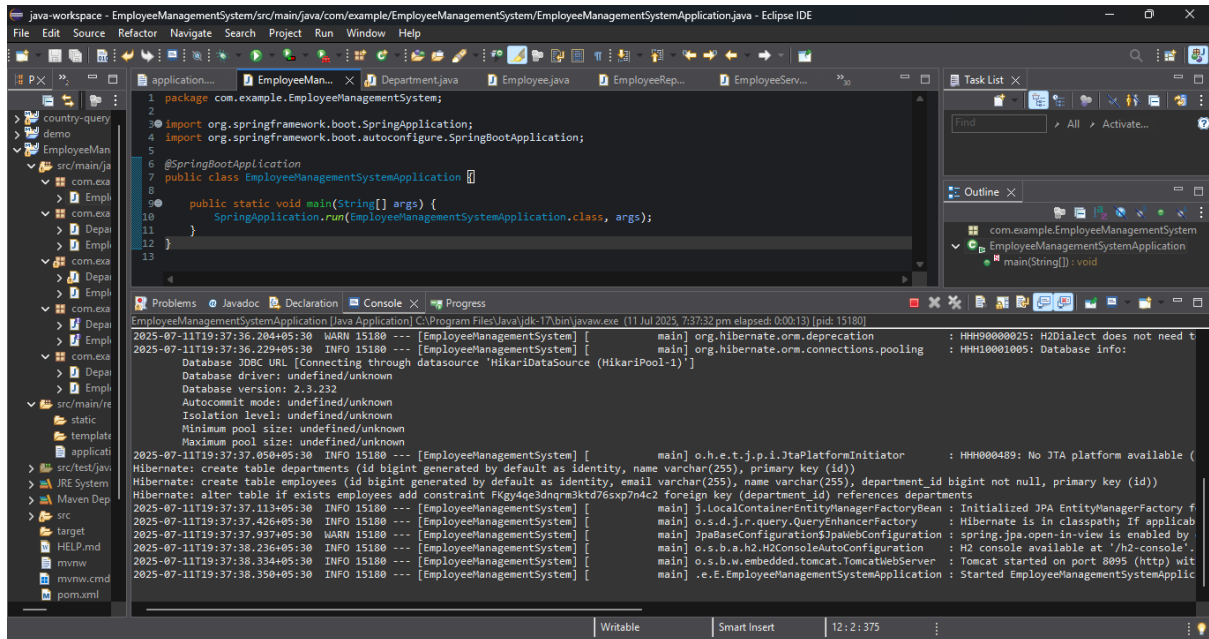
Output:



```
EmployeeManagementSystemApplication [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (11 Jul 2025, 7:31:09 pm elapsed: 0:00:17) [pid: 3444]
2025-07-11T19:31:13.615+05:30 INFO 3444 --- [EmployeeManagementSystem] [main] com.zaxxer.hikari.pool.HikariPool : HikariPool-1 - Added connection connor:
2025-07-11T19:31:13.615+05:30 INFO 3444 --- [EmployeeManagementSystem] [main] com.zaxxer.hikari.pool.HikariPool : HikariPool-1 - Start completed.
2025-07-11T19:31:13.645+05:30 WARN 3444 --- [EmployeeManagementSystem] [main] org.hibernate.orm.deprecation : HHH90000025: H2Dialect does not need to
2025-07-11T19:31:13.677+05:30 INFO 3444 --- [EmployeeManagementSystem] [main] org.hibernate.orm.connections.pooling : HHH10001005: Database info:
Database JDBC URL [Connecting through datasource 'HikariDataSource (HikariPool-1)']
Database driver: undefined/unknown
Database version: 2.3.232
Autocommit mode: undefined/unknown
Isolation level: undefined/unknown
Minimum pool size: undefined/unknown
Maximum pool size: undefined/unknown
2025-07-11T19:31:14.460+05:30 INFO 3444 --- [EmployeeManagementSystem] [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH000489: No JTA platform available (s
Hibernate: create table departments (id bigint generated by default as identity, name varchar(255), primary key (id))
Hibernate: create table employees (id bigint generated by default as identity, email varchar(255), name varchar(255), department_id bigint, primary key (id))
Hibernate: alter table if exists employees add constraint FKgy4qe3dnqrm3ktd76sxp7n4c2 foreign key (department_id) references departments
2025-07-11T19:31:14.520+05:30 INFO 3444 --- [EmployeeManagementSystem] [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory fo
2025-07-11T19:31:14.872+05:30 INFO 3444 --- [EmployeeManagementSystem] [main] jpaBaseConfiguration$JpaWebConfiguration : spring.jpa.open-in-view is enabled by d
2025-07-11T19:31:15.164+05:30 INFO 3444 --- [EmployeeManagementSystem] [main] o.s.b.a.h2.H2ConsoleAutoConfiguration : H2 console available at '/h2-console'.
2025-07-11T19:31:15.257+05:30 INFO 3444 --- [EmployeeManagementSystem] [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8094 (http) with
2025-07-11T19:31:15.275+05:30 INFO 3444 --- [EmployeeManagementSystem] [main] .e.E.EmployeeManagementSystemApplication : Started EmployeeManagementSystemApplica
```

Exercise 5: Employee Management System - Defining Query Methods

Output:



```
java-workspace - EmployeeManagementSystem/src/main/java/com/example/EmployeeManagementSystem/EmployeeManagementSystemApplication.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

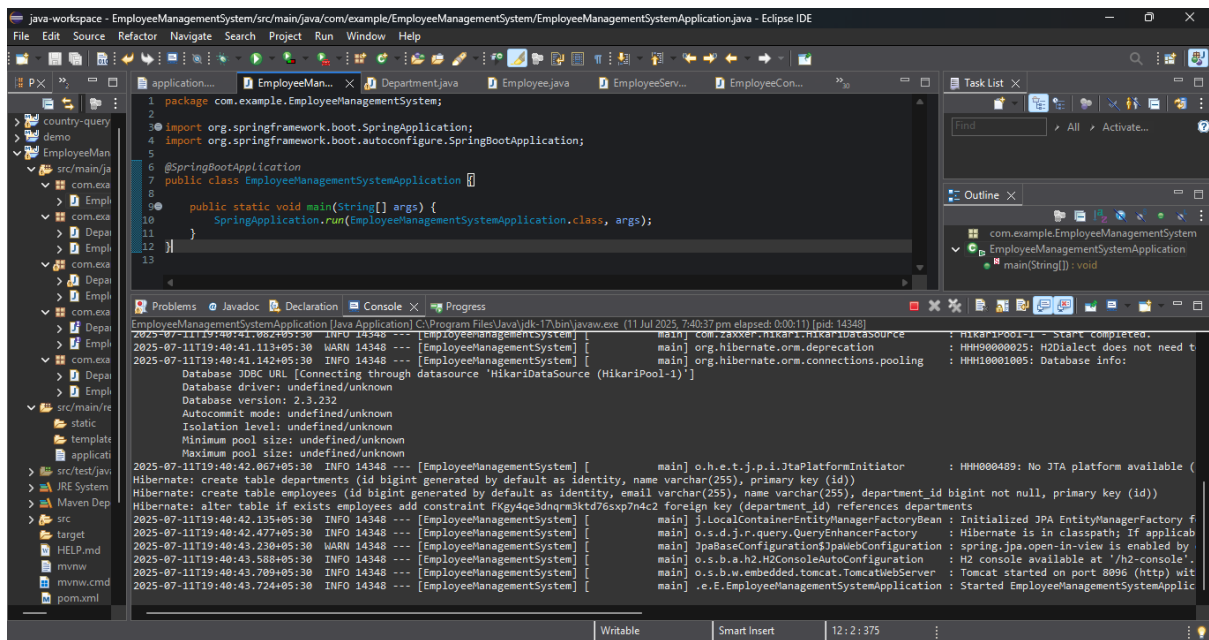
1 package com.example.EmployeeManagementSystem;
2
3 import org.springframework.boot.SpringApplication;
4 import org.springframework.boot.autoconfigure.SpringBootApplication;
5
6 @SpringBootApplication
7 public class EmployeeManagementSystemApplication {
8
9     public static void main(String[] args) {
10         SpringApplication.run(EmployeeManagementSystemApplication.class, args);
11     }
12 }
13

Problems Javadoc Declaration Console Progress
EmployeeManagementSystemApplication [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (11 Jul 2025, 7:37:32 pm elapsed: 0:00:13) [pid: 15180]
2025-07-11T19:37:36.204+05:30 WARN 15180 --- [EmployeeManagementSystem] [main] org.hibernate.orm.deprecation : HHH0000025: H2Dialect does not need t
2025-07-11T19:37:36.229+05:30 INFO 15180 --- [EmployeeManagementSystem] [main] org.hibernate.orm.connections.pooling : HHH10001005: Database info:
Database JDBC URL [connecting through datasource 'HikariDataSource (HikariPool-1)']
Database driver: undefined/unknown
Database version: 2.3.232
Autocommit mode: undefined/unknown
Isolation level: undefined/unknown
Minimum pool size: undefined/unknown
Maximum pool size: undefined/unknown
2025-07-11T19:37:37.050+05:30 INFO 15180 --- [EmployeeManagementSystem] [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH000489: No JTA platform available (
Hibernate: create table departments (id bigint generated by default as identity, name varchar(255), primary key (id))
Hibernate: alter table employees (id bigint generated by default as identity, email varchar(255), department_id bigint not null, primary key (id))
2025-07-11T19:37:37.113+05:30 INFO 15180 --- [EmployeeManagementSystem] [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory f
2025-07-11T19:37:37.426+05:30 INFO 15180 --- [EmployeeManagementSystem] [main] o.s.d.j.r.query.QueryEnhancerFactory : Hibernate is in classpath; If applicab
2025-07-11T19:37:37.937+05:30 WARN 15180 --- [EmployeeManagementSystem] [main] JpaBaseConfiguration$JpaWebConfiguration : spring.jpa.open-in-view is enabled by
2025-07-11T19:37:38.236+05:30 INFO 15180 --- [EmployeeManagementSystem] [main] o.s.b.a.h2.H2ConsoleAutoConfiguration : H2 console available at '/h2-console'.
2025-07-11T19:37:38.334+05:30 INFO 15180 --- [EmployeeManagementSystem] [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8095 (http wit
2025-07-11T19:37:38.350+05:30 INFO 15180 --- [EmployeeManagementSystem] [main] .e.E.EmployeeManagementSystemApplication : Started EmployeeManagementSystemApplic

Writable Smart Insert 12:2:375
```

Exercise 6: Employee Management System - Implementing Pagination and Sorting

Output:



```
java-workspace - EmployeeManagementSystem/src/main/java/com/example/EmployeeManagementSystem/EmployeeManagementSystemApplication.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

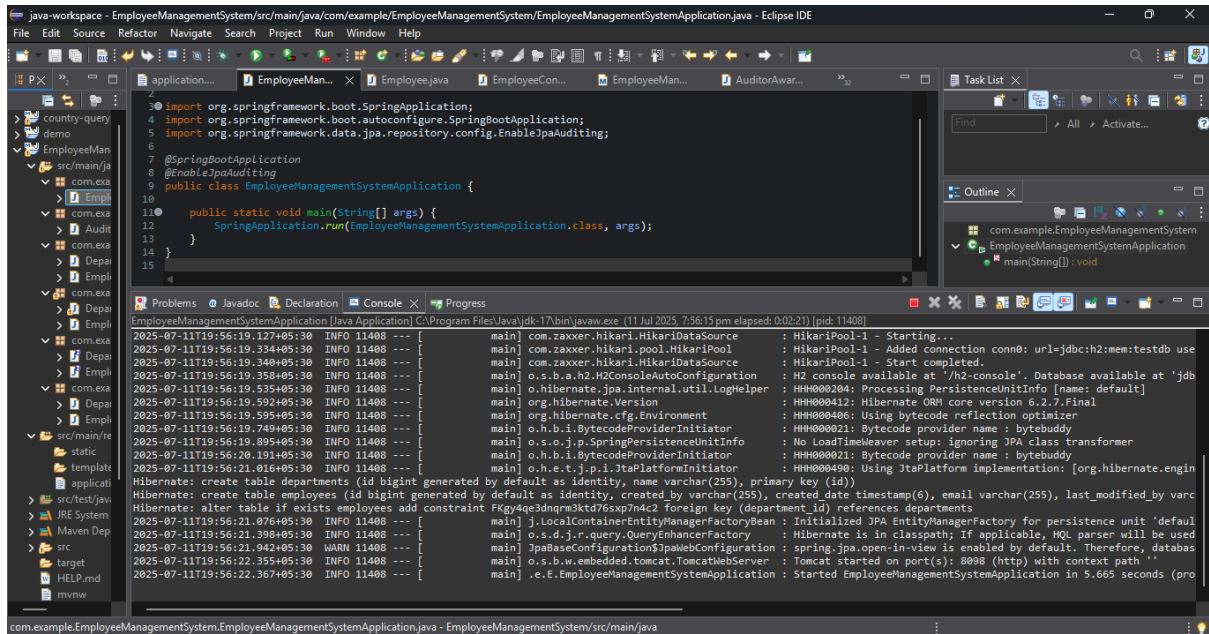
1 package com.example.EmployeeManagementSystem;
2
3 import org.springframework.boot.SpringApplication;
4 import org.springframework.boot.autoconfigure.SpringBootApplication;
5
6 @SpringBootApplication
7 public class EmployeeManagementSystemApplication {
8
9     public static void main(String[] args) {
10         SpringApplication.run(EmployeeManagementSystemApplication.class, args);
11     }
12 }
13

Problems Javadoc Declaration Console Progress
EmployeeManagementSystemApplication [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (11 Jul 2025, 7:40:37 pm elapsed: 0:00:11) [pid: 14348]
2025-07-11T19:40:41.113+05:30 INFO 14348 --- [EmployeeManagementSystem] [main] org.springframework.jdbc.datasource.lookup.HikariDataSourceLookup : HikariPool-1 - Start completed.
2025-07-11T19:40:41.113+05:30 WARN 14348 --- [EmployeeManagementSystem] [main] org.hibernate.orm.deprecation : HHH0000025: H2Dialect does not need t
2025-07-11T19:40:41.142+05:30 INFO 14348 --- [EmployeeManagementSystem] [main] org.hibernate.orm.connections.pooling : HHH10001005: Database info:
Database JDBC URL [connecting through datasource 'HikariDataSource (HikariPool-1)']
Database driver: undefined/unknown
Database version: 2.3.232
Autocommit mode: undefined/unknown
Isolation level: undefined/unknown
Minimum pool size: undefined/unknown
Maximum pool size: undefined/unknown
2025-07-11T19:40:42.067+05:30 INFO 14348 --- [EmployeeManagementSystem] [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH000489: No JTA platform available (
Hibernate: create table departments (id bigint generated by default as identity, name varchar(255), primary key (id))
Hibernate: alter table employees (id bigint generated by default as identity, email varchar(255), department_id bigint not null, primary key (id))
2025-07-11T19:40:42.427+05:30 INFO 14348 --- [EmployeeManagementSystem] [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory f
2025-07-11T19:40:43.230+05:30 INFO 14348 --- [EmployeeManagementSystem] [main] o.s.d.j.r.query.QueryEnhancerFactory : Hibernate is in classpath; If applicab
2025-07-11T19:40:43.588+05:30 INFO 14348 --- [EmployeeManagementSystem] [main] JpaBaseConfiguration$JpaWebConfiguration : spring.jpa.open-in-view is enabled by
2025-07-11T19:40:43.709+05:30 INFO 14348 --- [EmployeeManagementSystem] [main] o.s.b.a.h2.H2ConsoleAutoConfiguration : H2 console available at '/h2-console'.
2025-07-11T19:40:43.724+05:30 INFO 14348 --- [EmployeeManagementSystem] [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8096 (http wit
2025-07-11T19:40:43.724+05:30 INFO 14348 --- [EmployeeManagementSystem] [main] .e.E.EmployeeManagementSystemApplication : Started EmployeeManagementSystemApplic

Writable Smart Insert 12:2:375
```

Exercise 7: Employee Management System - Enabling Entity Auditing

Output:



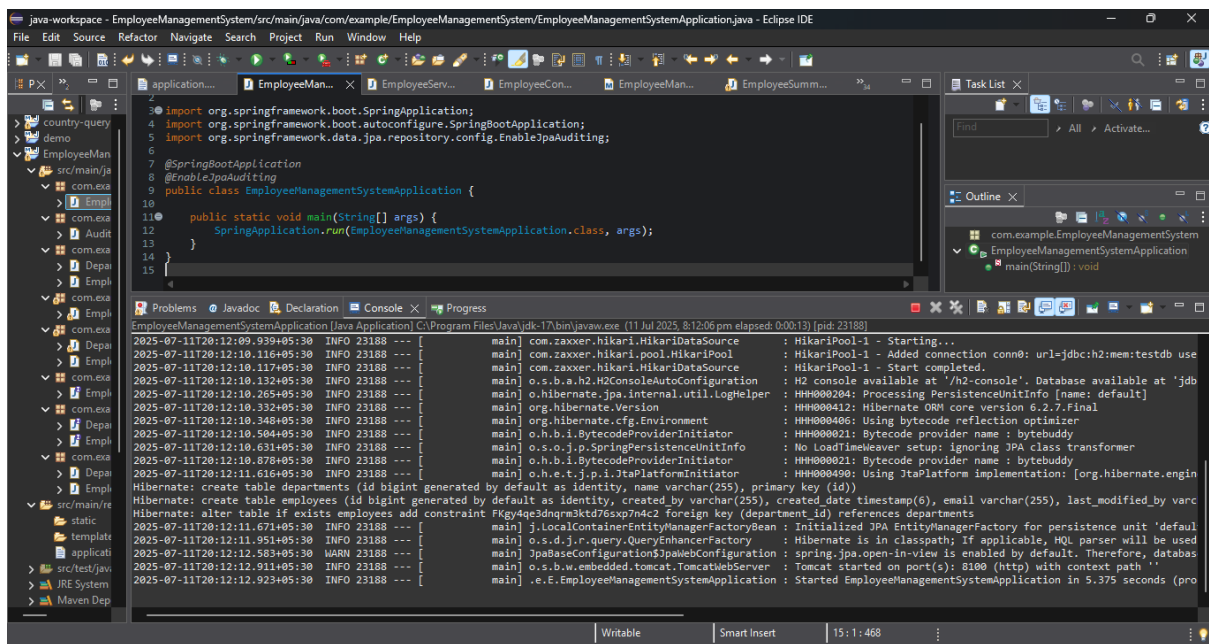
```
java-workspace - EmployeeManagementSystem/src/main/java/com/example/EmployeeManagementSystem/EmployeeManagementSystemApplication.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

P X  application... EmployeeMan... Employee.java EmployeeCon... EmployeeMan... AuditorAwar...
src/main/java/com/example/EmployeeManagementSystem/EmployeeManagementSystemApplication.java
1 import org.springframework.boot.SpringApplication;
2 import org.springframework.boot.autoconfigure.SpringBootApplication;
3 import org.springframework.data.jpa.repository.config.EnableJpaAuditing;
4
5 @SpringBootApplication
6 @EnableJpaAuditing
7 public class EmployeeManagementSystemApplication {
8
9     public static void main(String[] args) {
10         SpringApplication.run(EmployeeManagementSystemApplication.class, args);
11     }
12 }
13
14
15

Problems Declaration Console Progress
EmployeeManagementSystemApplication [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (11 Jul 2025, 7:56:15 pm elapsed: 0:02:21) [pid: 11408]
2025-07-11T19:56:19.127+05:30 INFO 11408 --- [main] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Starting...
2025-07-11T19:56:19.334+05:30 INFO 11408 --- [main] com.zaxxer.hikari.pool.HikariPool : HikariPool-1 - Added connection conn0: url=jdbc:h2:mem:testdb use
2025-07-11T19:56:19.340+05:30 INFO 11408 --- [main] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Start completed.
2025-07-11T19:56:19.358+05:30 INFO 11408 --- [main] o.s.b.a.h2.H2ConsoleAutoConfiguration : H2 console available at '/h2-console'. Database available at 'jdbc
2025-07-11T19:56:19.355+05:30 INFO 11408 --- [main] org.hibernate.jpa.internal.util.LogHelper : HHH000204: Processing PersistenceUnitInfo [name: default]
2025-07-11T19:56:19.592+05:30 INFO 11408 --- [main] org.hibernate.Version : HHH000412: Hibernate ORM core version 6.2.7.Final
2025-07-11T19:56:19.595+05:30 INFO 11408 --- [main] org.hibernate.cfg.Environment : HHH000406: Using bytecode reflection optimizer
2025-07-11T19:56:19.595+05:30 INFO 11408 --- [main] o.h.b.i.BytecodeProviderInitiator : HHH000021: Bytecode provider name : bytebuddy
2025-07-11T19:56:19.895+05:30 INFO 11408 --- [main] o.s.o.j.p.SpringPersistenceUnitInfo : No LoadTimeWeaver setup: ignoring JPA class transformer
2025-07-11T19:56:20.191+05:30 INFO 11408 --- [main] o.h.b.i.BytecodeProviderInitiator : HHH000021: Bytecode provider name : bytebuddy
2025-07-11T19:56:21.016+05:30 INFO 11408 --- [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH000490: Using JtaPlatform implementation: [org.hibernate.engine
Hibernate: create table departments (id bigint generated by default as identity, name varchar(255), primary key (id))
Hibernate: create table employees (id bigint generated by default as identity, created_by varchar(255), created_date timestamp(6), email varchar(255), last_modified_by varc
Hibernate: alter table if exists employees add constraint FKgy4qe3dnqrm3ktd76sxp7n4c2 foreign key (department_id) references departments
2025-07-11T19:56:21.076+05:30 INFO 11408 --- [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory for persistence unit 'default'
2025-07-11T19:56:21.398+05:30 INFO 11408 --- [main] o.s.d.j.r.query.QueryEnhancerFactory : Hibernate is in classpath; If applicable, HQL parser will be used
2025-07-11T19:56:21.342+05:30 WARN 11408 --- [main] JpaBaseConfigurationJpaWebConfiguration : spring.jpa.open-in-view is enabled by default. Therefore, databas
2025-07-11T19:56:22.355+05:30 INFO 11408 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with context path ''
2025-07-11T19:56:22.367+05:30 INFO 11408 --- [main] o.e.f.EmployeeManagementSystemApplication : Started EmployeeManagementSystemApplication in 5.665 seconds (pro
```

Exercise 8: Employee Management System - Creating Projections

Output:



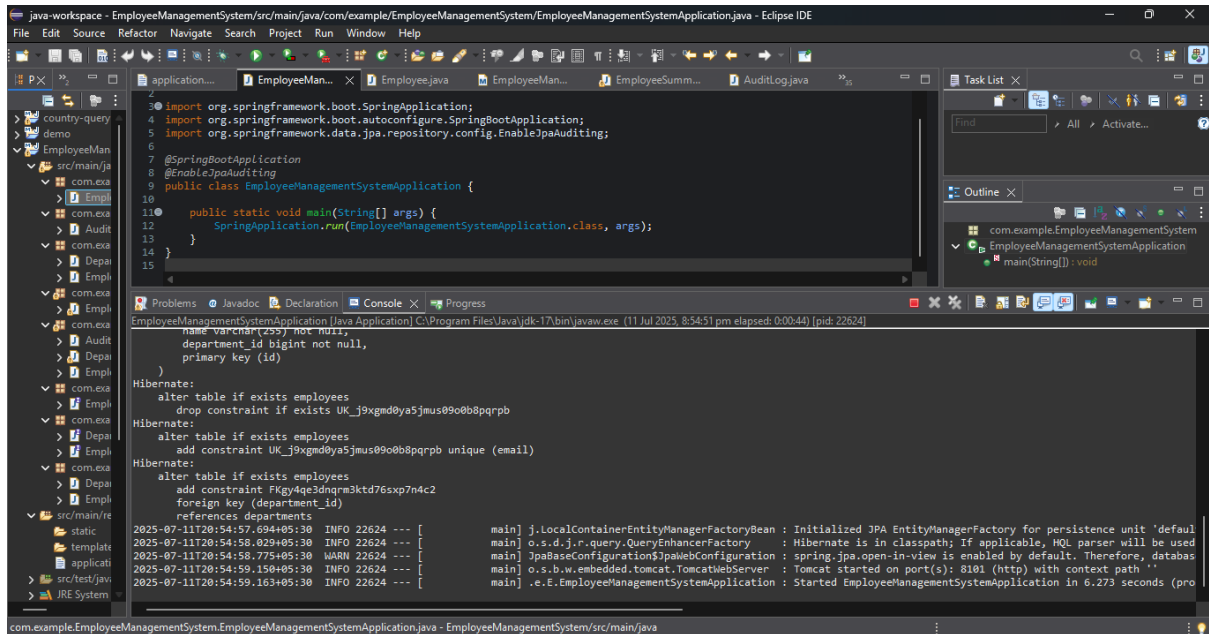
```
java-workspace - EmployeeManagementSystem/src/main/java/com/example/EmployeeManagementSystem/EmployeeManagementSystemApplication.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

P X  application... EmployeeMan... EmployeeServ... EmployeeCon... EmployeeMan... EmployeeSumm...
src/main/java/com/example/EmployeeManagementSystem/EmployeeManagementSystemApplication.java
1 import org.springframework.boot.SpringApplication;
2 import org.springframework.boot.autoconfigure.SpringBootApplication;
3 import org.springframework.data.jpa.repository.config.EnableJpaAuditing;
4
5 @SpringBootApplication
6 @EnableJpaAuditing
7 public class EmployeeManagementSystemApplication {
8
9     public static void main(String[] args) {
10         SpringApplication.run(EmployeeManagementSystemApplication.class, args);
11     }
12 }
13
14
15

Problems Declaration Console Progress
EmployeeManagementSystemApplication [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (11 Jul 2025, 8:12:06 pm elapsed: 0:00:13) [pid: 23188]
2025-07-11T20:12:09.939+05:30 INFO 23188 --- [main] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Starting...
2025-07-11T20:12:10.116+05:30 INFO 23188 --- [main] com.zaxxer.hikari.pool.HikariPool : HikariPool-1 - Added connection conn0: url=jdbc:h2:mem:testdb use
2025-07-11T20:12:10.117+05:30 INFO 23188 --- [main] com.zaxxer.hikari.HikariDataSource : HikariPool-1 - Start completed.
2025-07-11T20:12:10.132+05:30 INFO 23188 --- [main] o.s.b.a.h2.H2ConsoleAutoConfiguration : H2 console available at '/h2-console'. Database available at 'jdbc
2025-07-11T20:12:10.165+05:30 INFO 23188 --- [main] org.hibernate.jpa.internal.util.LogHelper : HHH000204: Processing PersistenceUnitInfo [name: default]
2025-07-11T20:12:10.332+05:30 INFO 23188 --- [main] org.hibernate.Version : HHH000412: Hibernate ORM core version 6.2.7.Final
2025-07-11T20:12:10.340+05:30 INFO 23188 --- [main] org.hibernate.cfg.Environment : HHH000406: Using bytecode reflection optimizer
2025-07-11T20:12:10.504+05:30 INFO 23188 --- [main] o.h.b.i.BytecodeProviderInitiator : HHH000021: Bytecode provider name : bytebuddy
2025-07-11T20:12:10.631+05:30 INFO 23188 --- [main] o.s.o.j.p.SpringPersistenceUnitInfo : No LoadTimeWeaver setup: ignoring JPA class transformer
2025-07-11T20:12:10.670+05:30 INFO 23188 --- [main] o.h.b.i.BytecodeProviderInitiator : HHH000021: Bytecode provider name : bytebuddy
2025-07-11T20:12:11.616+05:30 INFO 23188 --- [main] o.h.e.t.j.p.i.JtaPlatformInitiator : HHH000490: Using JtaPlatform implementation: [org.hibernate.engine
Hibernate: create table departments (id bigint generated by default as identity, name varchar(255), primary key (id))
Hibernate: alter table if exists employees add constraint FKgy4qe3dnqrm3ktd76sxp7n4c2 foreign key (department_id) references departments
2025-07-11T20:12:11.671+05:30 INFO 23188 --- [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory for persistence unit 'default'
2025-07-11T20:12:11.951+05:30 INFO 23188 --- [main] o.s.d.j.r.query.QueryEnhancerFactory : Hibernate is in classpath; If applicable, HQL parser will be used
2025-07-11T20:12:12.583+05:30 WARN 23188 --- [main] JpaBaseConfigurationJpaWebConfiguration : spring.jpa.open-in-view is enabled by default. Therefore, databas
2025-07-11T20:12:12.911+05:30 INFO 23188 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8100 (http) with context path ''
2025-07-11T20:12:12.923+05:30 INFO 23188 --- [main] o.e.f.EmployeeManagementSystemApplication : Started EmployeeManagementSystemApplication in 5.375 seconds (pro
```


Exercise 9: Employee Management System - Customizing Data Source Configuration

Output:



```
java-workspace - EmployeeManagementSystem/src/main/java/com/example/EmployeeManagementSystem/EmployeeManagementSystemApplication.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

application... EmployeeMan... Employee.java EmployeeMan... EmployeeSumm... AuditLog.java
2 import org.springframework.boot.SpringApplication;
3 import org.springframework.boot.autoconfigure.SpringBootApplication;
4 import org.springframework.data.jpa.repository.config.EnableJpaAuditing;
5
6
7 @SpringBootApplication
8 @EnableJpaAuditing
9 public class EmployeeManagementSystemApplication {
10
11     public static void main(String[] args) {
12         SpringApplication.run(EmployeeManagementSystemApplication.class, args);
13     }
14 }
15

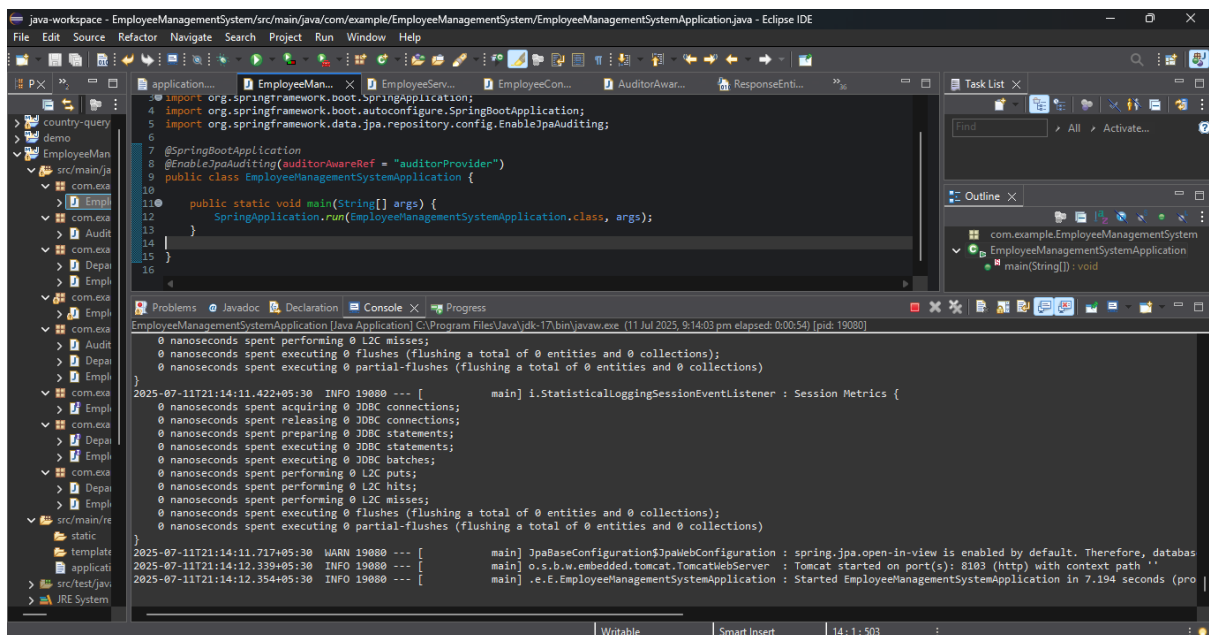
Problems Javadoc Declaration Console Progress
EmployeeManagementSystemApplication [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (11 Jul 2025, 8:54:51 pm elapsed: 0:00:44) [pid: 22624]

Hibernate:
alter table if exists employees
drop constraint if exists UK_j9xgmd0ya5jmus09o0b8qrpq
Hibernate:
alter table if exists employees
add constraint UK_j9xgmd0ya5jmus09o0b8qrpq unique (email)
Hibernate:
alter table if exists employees
add constraint FK_y4qe3dnqr3kt476sxp7n4c2
foreign key (department_id)
references departments

2025-07-11T20:54:57.694+05:30 INFO 22624 --- [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory for persistence unit 'default'
2025-07-11T20:54:58.029+05:30 INFO 22624 --- [main] o.s.d.j.r.query.QueryEnhancerFactory : Hibernate is in classpath; if applicable, HQL parser will be used
2025-07-11T20:54:58.775+05:30 WARN 22624 --- [main] jpaBaseConfiguration$JpaWebConfiguration : spring.jpa.open-in-view is enabled by default. Therefore, database access may be performed during view rendering.
2025-07-11T20:54:59.158+05:30 INFO 22624 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8101 (http) with context path ''
2025-07-11T20:54:59.163+05:30 INFO 22624 --- [main] .e.E.EmployeeManagementSystemApplication : Started EmployeeManagementSystemApplication in 6.273 seconds (process running for 10.057)
```

Exercise 10: Employee Management System - Hibernate-Specific Features

Output:



```
java-workspace - EmployeeManagementSystem/src/main/java/com/example/EmployeeManagementSystem/EmployeeManagementSystemApplication.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help

application... EmployeeMan... EmployeeServ... EmployeeCon... AuditorAware... ResponseEnt...
2 import org.springframework.boot.SpringApplication;
3 import org.springframework.boot.autoconfigure.SpringBootApplication;
4 import org.springframework.data.jpa.repository.config.EnableJpaAuditing;
5
6
7 @SpringBootApplication
8 @EnableJpaAuditing(auditorAwareRef = "auditorProvider")
9 public class EmployeeManagementSystemApplication {
10
11     public static void main(String[] args) {
12         SpringApplication.run(EmployeeManagementSystemApplication.class, args);
13     }
14 }
15
16

Problems Javadoc Declaration Console Progress
EmployeeManagementSystemApplication [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (11 Jul 2025, 9:14:03 pm elapsed: 0:00:54) [pid: 19080]

0 nanoseconds spent performing 0 L2C misses;
0 nanoseconds spent executing 0 flushes (flushing a total of 0 entities and 0 collections);
0 nanoseconds spent executing 0 partial-flushes (flushing a total of 0 entities and 0 collections)
}
2025-07-11T21:14:11.422+05:30 INFO 19080 --- [main] i.StatisticalLoggingSessionEventListener : Session Metrics {
0 nanoseconds spent acquiring 0 JDBC connections;
0 nanoseconds spent releasing 0 JDBC connections;
0 nanoseconds spent preparing 0 JDBC statements;
0 nanoseconds spent executing 0 JDBC statements;
0 nanoseconds spent executing 0 JDBC batches;
0 nanoseconds spent performing 0 L2C puts;
0 nanoseconds spent performing 0 L2C hits;
0 nanoseconds spent performing 0 L2C misses;
0 nanoseconds spent executing 0 flushes (flushing a total of 0 entities and 0 collections);
0 nanoseconds spent executing 0 partial-flushes (flushing a total of 0 entities and 0 collections)
}
2025-07-11T21:14:11.717+05:30 WARN 19080 --- [main] jpaBaseConfiguration$JpaWebConfiguration : spring.jpa.open-in-view is enabled by default. Therefore, database access may be performed during view rendering.
2025-07-11T21:14:12.339+05:30 INFO 19080 --- [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8103 (http) with context path ''
2025-07-11T21:14:12.354+05:30 INFO 19080 --- [main] .e.E.EmployeeManagementSystemApplication : Started EmployeeManagementSystemApplication in 7.194 seconds (process running for 10.057)
```