

Spring Boot: Working with Stored Procedures

1. What is a Stored Procedure?

A stored procedure is a precompiled group of SQL statements stored in the database.

It can take input (IN), return output (OUT), or both. It allows encapsulating business logic inside the database.

2. Two Ways to Call Stored Procedures in Spring Boot

2.1 Using @NamedStoredProcedureQuery (Annotation-based)

- Tied to Entity class using annotations
- Works well with simple IN parameters and when procedure returns data mapped to an entity
- Requires @NamedStoredProcedureQueries in case of multiple procedures

Example:

```
@Entity
@NamedStoredProcedureQueries({
    @NamedStoredProcedureQuery(
        name = "Employee.getById",
        procedureName = "get_employee_by_id",
        resultClasses = Employee.class,
        parameters = {
            @StoredProcedureParameter(mode = ParameterMode.IN, name = "empld", type = Integer.class)
        }
    )
})
public class Employee { ... }
```

In Repository:

```
@Procedure(name = "Employee.getById")
List<Employee> getEmployeeById(@Param("empld") Integer id);
```

2.2 Using EntityManager.createStoredProcedureQuery() (Programmatic approach)

- Cleaner and more flexible
- No annotations required
- Supports complex IN/OUT parameters and dynamic queries
- Keeps DB logic out of the entity class

Example:

```
@PersistenceContext
private EntityManager entityManager;

public List<Employee> getEmployeeById(int id) {
    StoredProcedureQuery query = entityManager.createStoredProcedureQuery("get_employee_by_id",
Employee.class);
    query.registerStoredProcedureParameter("empld", Integer.class, ParameterMode.IN);
    query.setParameter("empld", id);
    return query.getResultList();
}
```

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3. Which Approach to Use?

Use `@NamedStoredProcedureQuery` when:

- You have simple IN parameters
- Procedure returns full entity objects
- You're using Spring Data JPA repositories

Use `EntityManager.createStoredProcedureQuery` when:

- You need OUT parameters or custom result sets
- You want clean entity classes
- You want dynamic and flexible procedure execution