**Spring data JPA HandsOn**

**HandsOn 1**

**Spring Data JPA – Quick Example**

* **Spring Initializr**

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* **MySql**

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* **Outline**

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* **application.properties**

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* **com.cognizant.ormlearn – OrmLearnApplication.java**

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* **com.cognizant.ormlearn.model – Country.java**

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* **com.cognizant.ormlearn.repository – CountryRepository.java**

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* **com.cognizant.ormlearn.service – CountryService.java**

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* **Console Output**

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* **MySql output**

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**HandsOn 4**

**Difference between JPA, Hibernate and Spring Data JPA**

1. **Java Persistence API (JPA)**

* It is a Java standard (part of Java EE) that defines how to map Java objects to database tables.
* JPA only provides interfaces and annotations—it doesn’t offer actual database access logic.
* You need a provider (like Hibernate) to use JPA in real applications.

1. **Hibernate**

* Hibernate is a widely used ORM (Object Relational Mapping) tool that implements the JPA specification.
* It simplifies database interactions by converting Java objects to SQL queries and vice versa.
* Offers features like caching, lazy loading, and advanced query support (HQL).

1. **Spring Data JPA**

* Built on top of JPA and integrates with Spring Boot for ease of development.  
  Automatically generates CRUD operations—no need to write SQL or boilerplate DAO code.
* Helps in managing repositories using interfaces, and provides custom query support using method names or @Query annotations.
* Still requires an underlying JPA provider (e.g., Hibernate) to work.

1. **Code Comparison**

* **Traditional Hibernate Example:**

Session session = sessionFactory.openSession();

Transaction tx = session.beginTransaction();

session.save(employee);

tx.commit();

session.close();

* **Spring Data JPA Equivalent:**

@Autowired

private EmployeeRepository employeeRepo;

employeeRepo.save(employee);

**HandsOn 5**

**Implement services for managing Country**

* **application.properties**

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* **com.cognizant.ormlearn – OrmLearnApplication.java**

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* **com.cognizant.ormlearn.service – CountryService.java**

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* **com.cognizant.ormlearn.service – CountryServiceImpl.java**

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* **data.sql**
* insert into country (co\_code, co\_name) values ("AF", "Afghanistan");
* insert into country (co\_code, co\_name) values ("AL", "Albania");
* insert into country (co\_code, co\_name) values ("DZ", "Algeria");
* insert into country (co\_code, co\_name) values ("AS", "American Samoa");
* insert into country (co\_code, co\_name) values ("AD", "Andorra");
* insert into country (co\_code, co\_name) values ("AO", "Angola");
* insert into country (co\_code, co\_name) values ("AI", "Anguilla");
* insert into country (co\_code, co\_name) values ("AQ", "Antarctica");
* insert into country (co\_code, co\_name) values ("AG", "Antigua and Barbuda");
* insert into country (co\_code, co\_name) values ("AR", "Argentina");
* insert into country (co\_code, co\_name) values ("AM", "Armenia");
* insert into country (co\_code, co\_name) values ("AW", "Aruba");
* insert into country (co\_code, co\_name) values ("AU", "Australia");
* insert into country (co\_code, co\_name) values ("AT", "Austria");
* insert into country (co\_code, co\_name) values ("AZ", "Azerbaijan");
* insert into country (co\_code, co\_name) values ("BS", "Bahamas");
* insert into country (co\_code, co\_name) values ("BH", "Bahrain");
* insert into country (co\_code, co\_name) values ("BD", "Bangladesh");
* insert into country (co\_code, co\_name) values ("BB", "Barbados");
* insert into country (co\_code, co\_name) values ("BY", "Belarus");
* insert into country (co\_code, co\_name) values ("BE", "Belgium");
* insert into country (co\_code, co\_name) values ("BZ", "Belize");
* insert into country (co\_code, co\_name) values ("BJ", "Benin");
* insert into country (co\_code, co\_name) values ("BM", "Bermuda");
* insert into country (co\_code, co\_name) values ("BT", "Bhutan");
* insert into country (co\_code, co\_name) values ("BO", "Bolivia, Plurinational State of");
* insert into country (co\_code, co\_name) values ("BQ", "Bonaire, Sint Eustatius and Saba");
* insert into country (co\_code, co\_name) values ("BA", "Bosnia and Herzegovina");
* insert into country (co\_code, co\_name) values ("BW", "Botswana");
* insert into country (co\_code, co\_name) values ("BV", "Bouvet Island");
* insert into country (co\_code, co\_name) values ("BR", "Brazil");
* insert into country (co\_code, co\_name) values ("IO", "British Indian Ocean Territory");
* insert into country (co\_code, co\_name) values ("BN", "Brunei Darussalam");
* insert into country (co\_code, co\_name) values ("BG", "Bulgaria");
* insert into country (co\_code, co\_name) values ("BF", "Burkina Faso");
* insert into country (co\_code, co\_name) values ("BI", "Burundi");
* insert into country (co\_code, co\_name) values ("KH", "Cambodia");
* insert into country (co\_code, co\_name) values ("CM", "Cameroon");
* insert into country (co\_code, co\_name) values ("CA", "Canada");
* insert into country (co\_code, co\_name) values ("CV", "Cape Verde");
* insert into country (co\_code, co\_name) values ("KY", "Cayman Islands");
* insert into country (co\_code, co\_name) values ("CF", "Central African Republic");
* insert into country (co\_code, co\_name) values ("TD", "Chad");
* insert into country (co\_code, co\_name) values ("CL", "Chile");
* insert into country (co\_code, co\_name) values ("CN", "China");
* insert into country (co\_code, co\_name) values ("CX", "Christmas Island");
* insert into country (co\_code, co\_name) values ("CC", "Cocos (Keeling) Islands");
* insert into country (co\_code, co\_name) values ("CO", "Colombia");
* insert into country (co\_code, co\_name) values ("KM", "Comoros");
* insert into country (co\_code, co\_name) values ("CG", "Congo");
* insert into country (co\_code, co\_name) values ("CD", "Congo, the Democratic Republic of the");
* insert into country (co\_code, co\_name) values ("CK", "Cook Islands");
* insert into country (co\_code, co\_name) values ("CR", "Costa Rica");
* insert into country (co\_code, co\_name) values ("HR", "Croatia");
* insert into country (co\_code, co\_name) values ("CU", "Cuba");
* insert into country (co\_code, co\_name) values ("CW", "Curaçao");
* insert into country (co\_code, co\_name) values ("CY", "Cyprus");
* insert into country (co\_code, co\_name) values ("CZ", "Czech Republic");
* insert into country (co\_code, co\_name) values ("CI", "Côte d'Ivoire");
* insert into country (co\_code, co\_name) values ("DK", "Denmark");
* insert into country (co\_code, co\_name) values ("DJ", "Djibouti");
* insert into country (co\_code, co\_name) values ("DM", "Dominica");
* insert into country (co\_code, co\_name) values ("DO", "Dominican Republic");
* insert into country (co\_code, co\_name) values ("EC", "Ecuador");
* insert into country (co\_code, co\_name) values ("EG", "Egypt");
* insert into country (co\_code, co\_name) values ("SV", "El Salvador");
* insert into country (co\_code, co\_name) values ("GQ", "Equatorial Guinea");
* insert into country (co\_code, co\_name) values ("ER", "Eritrea");
* insert into country (co\_code, co\_name) values ("EE", "Estonia");
* insert into country (co\_code, co\_name) values ("ET", "Ethiopia");
* insert into country (co\_code, co\_name) values ("FK", "Falkland Islands (Malvinas)");
* insert into country (co\_code, co\_name) values ("FO", "Faroe Islands");
* insert into country (co\_code, co\_name) values ("FJ", "Fiji");
* insert into country (co\_code, co\_name) values ("FI", "Finland");
* insert into country (co\_code, co\_name) values ("FR", "France");
* insert into country (co\_code, co\_name) values ("GF", "French Guiana");
* insert into country (co\_code, co\_name) values ("PF", "French Polynesia");
* insert into country (co\_code, co\_name) values ("TF", "French Southern Territories");
* insert into country (co\_code, co\_name) values ("GA", "Gabon");
* insert into country (co\_code, co\_name) values ("GM", "Gambia");
* insert into country (co\_code, co\_name) values ("GE", "Georgia");
* insert into country (co\_code, co\_name) values ("DE", "Germany");
* insert into country (co\_code, co\_name) values ("GH", "Ghana");
* insert into country (co\_code, co\_name) values ("GI", "Gibraltar");
* insert into country (co\_code, co\_name) values ("GR", "Greece");
* insert into country (co\_code, co\_name) values ("GL", "Greenland");
* insert into country (co\_code, co\_name) values ("GD", "Grenada");
* insert into country (co\_code, co\_name) values ("GP", "Guadeloupe");
* insert into country (co\_code, co\_name) values ("GU", "Guam");
* insert into country (co\_code, co\_name) values ("GT", "Guatemala");
* insert into country (co\_code, co\_name) values ("GG", "Guernsey");
* insert into country (co\_code, co\_name) values ("GN", "Guinea");
* insert into country (co\_code, co\_name) values ("GW", "Guinea-Bissau");
* insert into country (co\_code, co\_name) values ("GY", "Guyana");
* insert into country (co\_code, co\_name) values ("HT", "Haiti");
* insert into country (co\_code, co\_name) values ("HM", "Heard Island and McDonald Islands");
* insert into country (co\_code, co\_name) values ("VA", "Holy See (Vatican City State)");
* insert into country (co\_code, co\_name) values ("HN", "Honduras");
* insert into country (co\_code, co\_name) values ("HK", "Hong Kong");
* insert into country (co\_code, co\_name) values ("HU", "Hungary");
* insert into country (co\_code, co\_name) values ("IS", "Iceland");
* insert into country (co\_code, co\_name) values ("IN", "India");
* insert into country (co\_code, co\_name) values ("ID", "Indonesia");
* insert into country (co\_code, co\_name) values ("IR", "Iran, Islamic Republic of");
* insert into country (co\_code, co\_name) values ("IQ", "Iraq");
* insert into country (co\_code, co\_name) values ("IE", "Ireland");
* insert into country (co\_code, co\_name) values ("IM", "Isle of Man");
* insert into country (co\_code, co\_name) values ("IL", "Israel");
* insert into country (co\_code, co\_name) values ("IT", "Italy");
* insert into country (co\_code, co\_name) values ("JM", "Jamaica");
* insert into country (co\_code, co\_name) values ("JP", "Japan");
* insert into country (co\_code, co\_name) values ("JE", "Jersey");
* insert into country (co\_code, co\_name) values ("JO", "Jordan");
* insert into country (co\_code, co\_name) values ("KZ", "Kazakhstan");
* insert into country (co\_code, co\_name) values ("KE", "Kenya");
* insert into country (co\_code, co\_name) values ("KI", "Kiribati");
* insert into country (co\_code, co\_name) values ("KP", "Democratic People's Republic of Korea");
* insert into country (co\_code, co\_name) values ("KR", "Republic of Korea");
* insert into country (co\_code, co\_name) values ("KW", "Kuwait");
* insert into country (co\_code, co\_name) values ("KG", "Kyrgyzstan");
* insert into country (co\_code, co\_name) values ("LA", "Lao People's Democratic Republic");
* insert into country (co\_code, co\_name) values ("LV", "Latvia");
* insert into country (co\_code, co\_name) values ("LB", "Lebanon");
* insert into country (co\_code, co\_name) values ("LS", "Lesotho");
* insert into country (co\_code, co\_name) values ("LR", "Liberia");
* insert into country (co\_code, co\_name) values ("LY", "Libya");
* insert into country (co\_code, co\_name) values ("LI", "Liechtenstein");
* insert into country (co\_code, co\_name) values ("LT", "Lithuania");
* insert into country (co\_code, co\_name) values ("LU", "Luxembourg");
* insert into country (co\_code, co\_name) values ("MO", "Macao");
* insert into country (co\_code, co\_name) values ("MK", "Macedonia, the Former Yugoslav Republic of");
* insert into country (co\_code, co\_name) values ("MG", "Madagascar");
* insert into country (co\_code, co\_name) values ("MW", "Malawi");
* insert into country (co\_code, co\_name) values ("MY", "Malaysia");
* insert into country (co\_code, co\_name) values ("MV", "Maldives");
* insert into country (co\_code, co\_name) values ("ML", "Mali");
* insert into country (co\_code, co\_name) values ("MT", "Malta");
* insert into country (co\_code, co\_name) values ("MH", "Marshall Islands");
* insert into country (co\_code, co\_name) values ("MQ", "Martinique");
* insert into country (co\_code, co\_name) values ("MR", "Mauritania");
* insert into country (co\_code, co\_name) values ("MU", "Mauritius");
* insert into country (co\_code, co\_name) values ("YT", "Mayotte");
* insert into country (co\_code, co\_name) values ("MX", "Mexico");
* insert into country (co\_code, co\_name) values ("FM", "Micronesia, Federated States of");
* insert into country (co\_code, co\_name) values ("MD", "Moldova, Republic of");
* insert into country (co\_code, co\_name) values ("MC", "Monaco");
* insert into country (co\_code, co\_name) values ("MN", "Mongolia");
* insert into country (co\_code, co\_name) values ("ME", "Montenegro");
* insert into country (co\_code, co\_name) values ("MS", "Montserrat");
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* insert into country (co\_code, co\_name) values ("MZ", "Mozambique");
* insert into country (co\_code, co\_name) values ("MM", "Myanmar");
* insert into country (co\_code, co\_name) values ("NA", "Namibia");
* insert into country (co\_code, co\_name) values ("NR", "Nauru");
* insert into country (co\_code, co\_name) values ("NP", "Nepal");
* insert into country (co\_code, co\_name) values ("NL", "Netherlands");
* insert into country (co\_code, co\_name) values ("NC", "New Caledonia");
* insert into country (co\_code, co\_name) values ("NZ", "New Zealand");
* insert into country (co\_code, co\_name) values ("NI", "Nicaragua");
* insert into country (co\_code, co\_name) values ("NE", "Niger");
* insert into country (co\_code, co\_name) values ("NG", "Nigeria");
* insert into country (co\_code, co\_name) values ("NU", "Niue");
* insert into country (co\_code, co\_name) values ("NF", "Norfolk Island");
* insert into country (co\_code, co\_name) values ("MP", "Northern Mariana Islands");
* insert into country (co\_code, co\_name) values ("NO", "Norway");
* insert into country (co\_code, co\_name) values ("OM", "Oman");
* insert into country (co\_code, co\_name) values ("PK", "Pakistan");
* insert into country (co\_code, co\_name) values ("PW", "Palau");
* insert into country (co\_code, co\_name) values ("PS", "Palestine, State of");
* insert into country (co\_code, co\_name) values ("PA", "Panama");
* insert into country (co\_code, co\_name) values ("PG", "Papua New Guinea");
* insert into country (co\_code, co\_name) values ("PY", "Paraguay");
* insert into country (co\_code, co\_name) values ("PE", "Peru");
* insert into country (co\_code, co\_name) values ("PH", "Philippines");
* insert into country (co\_code, co\_name) values ("PN", "Pitcairn");
* insert into country (co\_code, co\_name) values ("PL", "Poland");
* insert into country (co\_code, co\_name) values ("PT", "Portugal");
* insert into country (co\_code, co\_name) values ("PR", "Puerto Rico");
* insert into country (co\_code, co\_name) values ("QA", "Qatar");
* insert into country (co\_code, co\_name) values ("RO", "Romania");
* insert into country (co\_code, co\_name) values ("RU", "Russian Federation");
* insert into country (co\_code, co\_name) values ("RW", "Rwanda");
* insert into country (co\_code, co\_name) values ("RE", "Réunion");
* insert into country (co\_code, co\_name) values ("BL", "Saint Barthélemy");
* insert into country (co\_code, co\_name) values ("SH", "Saint Helena, Ascension and Tristan da Cunha");
* insert into country (co\_code, co\_name) values ("KN", "Saint Kitts and Nevis");
* insert into country (co\_code, co\_name) values ("LC", "Saint Lucia");
* insert into country (co\_code, co\_name) values ("MF", "Saint Martin (French part)");
* insert into country (co\_code, co\_name) values ("PM", "Saint Pierre and Miquelon");
* insert into country (co\_code, co\_name) values ("VC", "Saint Vincent and the Grenadines");
* insert into country (co\_code, co\_name) values ("WS", "Samoa");
* insert into country (co\_code, co\_name) values ("SM", "San Marino");
* insert into country (co\_code, co\_name) values ("ST", "Sao Tome and Principe");
* insert into country (co\_code, co\_name) values ("SA", "Saudi Arabia");
* insert into country (co\_code, co\_name) values ("SN", "Senegal");
* insert into country (co\_code, co\_name) values ("RS", "Serbia");
* insert into country (co\_code, co\_name) values ("SC", "Seychelles");
* insert into country (co\_code, co\_name) values ("SL", "Sierra Leone");
* insert into country (co\_code, co\_name) values ("SG", "Singapore");
* insert into country (co\_code, co\_name) values ("SX", "Sint Maarten (Dutch part)");
* insert into country (co\_code, co\_name) values ("SK", "Slovakia");
* insert into country (co\_code, co\_name) values ("SI", "Slovenia");
* insert into country (co\_code, co\_name) values ("SB", "Solomon Islands");
* insert into country (co\_code, co\_name) values ("SO", "Somalia");
* insert into country (co\_code, co\_name) values ("ZA", "South Africa");
* insert into country (co\_code, co\_name) values ("GS", "South Georgia and the South Sandwich Islands");
* insert into country (co\_code, co\_name) values ("SS", "South Sudan");
* insert into country (co\_code, co\_name) values ("ES", "Spain");
* insert into country (co\_code, co\_name) values ("LK", "Sri Lanka");
* insert into country (co\_code, co\_name) values ("SD", "Sudan");
* insert into country (co\_code, co\_name) values ("SR", "Suriname");
* insert into country (co\_code, co\_name) values ("SJ", "Svalbard and Jan Mayen");
* insert into country (co\_code, co\_name) values ("SZ", "Swaziland");
* insert into country (co\_code, co\_name) values ("SE", "Sweden");
* insert into country (co\_code, co\_name) values ("CH", "Switzerland");
* insert into country (co\_code, co\_name) values ("SY", "Syrian Arab Republic");
* insert into country (co\_code, co\_name) values ("TW", "Taiwan, Province of China");
* insert into country (co\_code, co\_name) values ("TJ", "Tajikistan");
* insert into country (co\_code, co\_name) values ("TZ", "Tanzania, United Republic of");
* insert into country (co\_code, co\_name) values ("TH", "Thailand");
* insert into country (co\_code, co\_name) values ("TL", "Timor-Leste");
* insert into country (co\_code, co\_name) values ("TG", "Togo");
* insert into country (co\_code, co\_name) values ("TK", "Tokelau");
* insert into country (co\_code, co\_name) values ("TO", "Tonga");
* insert into country (co\_code, co\_name) values ("TT", "Trinidad and Tobago");
* insert into country (co\_code, co\_name) values ("TN", "Tunisia");
* insert into country (co\_code, co\_name) values ("TR", "Turkey");
* insert into country (co\_code, co\_name) values ("TM", "Turkmenistan");
* insert into country (co\_code, co\_name) values ("TC", "Turks and Caicos Islands");
* insert into country (co\_code, co\_name) values ("TV", "Tuvalu");
* insert into country (co\_code, co\_name) values ("UG", "Uganda");
* insert into country (co\_code, co\_name) values ("UA", "Ukraine");
* insert into country (co\_code, co\_name) values ("AE", "United Arab Emirates");
* insert into country (co\_code, co\_name) values ("GB", "United Kingdom");
* insert into country (co\_code, co\_name) values ("US", "United States");
* insert into country (co\_code, co\_name) values ("UM", "United States Minor Outlying Islands");
* insert into country (co\_code, co\_name) values ("UY", "Uruguay");
* insert into country (co\_code, co\_name) values ("UZ", "Uzbekistan");
* insert into country (co\_code, co\_name) values ("VU", "Vanuatu");
* insert into country (co\_code, co\_name) values ("VE", "Venezuela, Bolivarian Republic of");
* insert into country (co\_code, co\_name) values ("VN", "Viet Nam");
* insert into country (co\_code, co\_name) values ("VG", "Virgin Islands, British");
* insert into country (co\_code, co\_name) values ("VI", "Virgin Islands, U.S.");
* insert into country (co\_code, co\_name) values ("WF", "Wallis and Futuna");
* insert into country (co\_code, co\_name) values ("EH", "Western Sahara");
* insert into country (co\_code, co\_name) values ("YE", "Yemen");
* insert into country (co\_code, co\_name) values ("ZM", "Zambia");
* insert into country (co\_code, co\_name) values ("ZW", "Zimbabwe");
* insert into country (co\_code, co\_name) values ("AX", "Åland Islands");
* **Console Output**

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**HandsOn 6**

**Find a country based on country code**

* **application.properties**

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* **com.cognizant.springlearn.service – CountryService.java**

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* **com.cognizant.springlearn.service.exception – CountryNotFoundException.java**

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* **Console Output**

2025-07-05T06:15:10.123+05:30 INFO 14232 --- [ restartedMain] c.c.springlearn.OrmLearnApplication : Starting OrmLearnApplication using Java 21.0.7

2025-07-05T06:15:10.456+05:30 INFO 14232 --- [ restartedMain] c.c.springlearn.OrmLearnApplication : Start testFindCountryByCode

Hibernate: select c1\_0.co\_code, c1\_0.co\_name from country c1\_0 where c1\_0.co\_code=?

2025-07-05T06:15:10.478+05:30 INFO 14232 --- [ restartedMain] c.c.springlearn.OrmLearnApplication : Country: Country{code='IN', name='India'}

2025-07-05T06:15:10.478+05:30 INFO 14232 --- [ restartedMain] c.c.springlearn.OrmLearnApplication : End testFindCountryByCode