Workshop #11(b)

Normalization

Aitrich Technologies Pvt. Ltd.

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# Introduction

This document explains the workshop module for the topic, Normalization. It illustrates different normalization levels.

This document comes along with the workshop, contains the tables for a Real estate firm project. Students may closely examine the usages of each Normalization in order to avail a hands-on experience.

# Objectives

The objectives of this workshop are to allow the student to explore and try the theory he learned during the lecture, and to make him well versed in the topic, so that he can use it in the further Java Programming endeavours.

# How is it organized?

The workshop is for a real- estate firm that lists property for sale. Test cases are distributed into three distinct levels where each level represents one major type of Normalization.

**Unnormalized relations:**

**Relation 1: Sales\_Branch**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Branch\_id** | **Address** | **State** | **City** | **Zipcode** | **Employee**  **Name** | **Employee**  **Address** | **Employee**  **Phone** | **Designation** |
| 1111 | 10 Main St. | Canberra | Albury | 734001 | Alston  Barry  Chatwin  Arleen | 2531 ROCKY RIDGE RD  328 FIRST ST  3089 E SHIELDS  11 STATE HWY 49 | 800-221-1212  702-505-8888  800-247-8726  800-433-7300 | ABR  ABRM  AHS  AHWD |
| 1123 | 15 New St. | Gold Creek | Glebe | 72656 | Alda  Corwin  Cyril  Cuthbert | 53 PAT'S RANCH RD  711 STATE HWY 49  22621 LAKE FOREST DR  801 W FLORIDA AVE | 800-352-0714  800-525-0280  800-221-1212 877-432-3473 | ALHS  AHWD  ABRM  ABR |
| 1245 | 10 Old St. | Balmain | Yamba | 73895 | Coana  Annette  Burgh  Cultra | 8171 MARGUERITE PKWY  640 E 1ST ST  14001 NEWPORT AVE  17080 BEAR VALLEY RD | 800-367-5320  800-652-6541  800-637-2247  800-635-8787 | AREP  ALHD  ASP  AHS |
| 1231 | 01 Carg St. | Hobart | Mudgee | 73965 | Glamis  Hawick  Norwich | 26503 GOLDEN VALLEY R  209 ELLA GRASSO TURNPIKE  51 E ALTAMONTE DR | 808-873-0877  800-448-4226  800-435-9792 | AHWD  ABRM  ABR |

**Relation 2: Property**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Property**  **Id** | **Property**  **Address** | **State** | **City** | **Zip code** | **Rate** | **Owner**  **Name** | **Owner**  **Address** | **Owner**  **Phone** |
| 1189 | 11322 OLD SHELL & MCGREGO | AL | LOWEL | 75623 | 45,000 | Groby  Kirkby | 1167 LINCOLN AVE  1368 MADERA R Y | 800-333-0276  866-266-5588 |
| 1156 | 6601 AIRPORT BLVD | AL | MALVERN | 75896 | 78,250 | Guildford | 1640 E 1ST S 1ST | 877-237-6627 |
| 1147 | 11774 L ORANGE BEACH A T | AR | MARION | 74123 | 1,50000 | Hawick  Leigh | 26503 GOLDEN VALLEY R  4184 TWEEDY BLVD | 800-237-6639  371 67006006 |
| 1148 | 4725 MAIN S L FOLEY BEACH & CANA | AL | NORTH LITTLE ROCK | 78963 | 10,50000 | Plaistow  Teston  Welwyn | 732 MONTAN  4184 TWEEDY BLVD  4184 TWEEDY BLVD | 888-912-8466  (+7317) 258-0950  603 2171 9333 |
| 1123 | 10951 L ROCKY RIDGE | AR | ROGERS | 74125 | 2,00000 | Naas | 1620 MENDOCINO AVE | (044) 490-3490 |

**First Normal Form:**

**Relation 1 : Sales\_Branch**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Branch\_id** | **Address** | **State** | **City** | **Zipcode** | **Employee**  **Name** | **Employee**  **Address** | **Employee**  **Phone** | **Designation** |
| 1111 | 10 Main St. | Canberra | Albury | 734001 | Alston | 2531 ROCKY RIDGE RD | 800-221-1212 | ABR |
| 1111 | 10 Main St. | Canberra | Albury | 734001 | Barry | 328 FIRST ST | 702-505-8888 | ABRM |
| 1111 | 10 Main St. | Canberra | Albury | 734001 | Chatwin | 3089 E SHIELDS | 800-247-8726 | AHS |
| 1111 | 10 Main St. | Canberra | Albury | 734001 | Arleen | 11 STATE HWY 49 | 800-433-7300 | AHWD |
| 1123 | 15 New St. | Gold Creek | Glebe | 72656 | Alda | 53 PAT'S RANCH RD | 800-352-0714 | ALHS |
| 1123 | 15 New St. | Gold Creek | Glebe | 72656 | Corwin | 711 STATE HWY 49 | 800-525-0280 | AHWD |
| 1123 | 15 New St. | Gold Creek | Glebe | 72656 | Cyril | 22621 LAKE FOREST DR | 800-221-1212 | ABRM |
| 1123 | 15 New St. | Gold Creek | Glebe | 72656 | Cuthbert | 801 W FLORIDA AVE | 877-432-3473 | ABR |
| 1245 | 10 Old St. | Balmain | Yamba | 73895 | Coana | 8171 MARGUERITE PKWY | 800-367-5320 | AREP |
| 1245 | 10 Old St. | Balmain | Yamba | 73895 | Annette | 640 E 1ST ST | 800-652-6541 | ALHD |
| 1245 | 10 Old St. | Balmain | Yamba | 73895 | Burgh | 14001 NEWPORT AVE | 800-637-2247 | ASP |
| 1245 | 10 Old St. | Balmain | Yamba | 73895 | Cultra | 17080 BEAR VALLEY RD | 800-635-8787 | AHS |
| 1231 | 01 Carg St. | Hobart | Mudgee | 73965 | Glamis | 26503 GOLDEN VALLEY R | 808-873-0877 | AHWD |
| 1231 | 01 Carg St. | Hobart | Mudgee | 73965 | Hawick | 209 ELLA GRASSO TURNPIKE | 800-448-4226 | ABRM |
| 1231 | 01 Carg St. | Hobart | Mudgee | 73965 | Norwich | 51 E ALTAMONTE DR | 800-435-9792 | ABRM |

**First Normal Form:**

**Relation 2 : Property**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Property  Id | Property  Address | State | City | Zip code | Rate | Owner  Name | Owner  Address | Owner  Phone |
| 1189 | 11322 OLD SHELL & MCGREGO | AL | LOWEL | 75623 | 45,000 | Groby | 1167 LINCOLN AVE | 800-333-0276 |
| 1189 | 11322 OLD SHELL & MCGREGO | AL | LOWEL | 75623 | 45,000 | Kirkby | 1368 MADERA R Y | 866-266-5588 |
| 1156 | 6601 AIRPORT BLVD | AL | MALVERN | 75896 | 78,250 | Guildford | 1640 E 1ST S 1ST | 877-237-6627 |
| 1147 | 11774 L ORANGE BEACH A T | AR | MARION | 74123 | 1,50000 | Hawick | 26503 GOLDEN VALLEY R | 800-237-6639 |
| 1147 | 11774 L ORANGE BEACH A T | AR | MARION | 74123 | 1,50000 | Leigh | 4184 TWEEDY BLVD | 371 67006006 |
| 1148 | 4725 MAIN S L FOLEY BEACH & CANA | AL | NORTH LITTLE ROCK | 78963 | 2,00000 | Kirkby | 1368 MADERA R Y | 866-266-5588 |
| 1148 | 4725 MAIN S L FOLEY BEACH & CANA | AL | NORTH LITTLE ROCK | 78963 | 2,00000 | Teston | 4184 TWEEDY BLVD | (+7317) 258-0950 |
| 1148 | 4725 MAIN S L FOLEY BEACH & CANA | AL | NORTH LITTLE ROCK | 78963 | 2,00000 | Welwyn | 4184 TWEEDY BLVD | 603 2171 9333 |
| 1123 | 10951 L ROCKY RIDGE | AR | ROGERS | 74125 | 2,00000 | Naas | 1620 MENDOCINO AVE | (044) 490-3490 |

**Second Normal Form**

Relation 1: Sales\_Branch

The Sales\_Branch relation is splits in to two separate relations

* Branch
* Employees

**Relation 1: Branches**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Branch\_id** | **Address** | **State** | **City** | **Zip code** |
| 1111 | 10 Main St. | Canberra | Albury | 734001 |
| 1123 | 15 New St. | Gold Creek | Glebe | 72656 |
| 1245 | 10 Old St. | Balmain | Yampa | 73895 |
| 1231 | 01 Carg St. | Hobart | Mudgee | 73965 |

**Relation 2 : Employees**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Employee**  **Id** | **Employee**  **Name** | **Employee**  **Address** | **Employee**  **Phone** | **Designation** | **Branch\_id** |
| 2111 | Alston | 2531 ROCKY RIDGE RD | 800-221-1212 | ABR | 1111 |
| 2112 | Barry | 328 FIRST ST | 702-505-8888 | ABRM | 1111 |
| 2113 | Chatwin | 3089 E SHIELDS | 800-247-8726 | AHS | 1111 |
| 2114 | Arleen | 11 STATE HWY 49 | 800-433-7300 | AHWD | 1111 |
| 2115 | Alda | 53 PAT'S RANCH RD | 800-352-0714 | ALHS | 1123 |
| 2116 | Corwin | 711 STATE HWY 49 | 800-525-0280 | AHWD | 1123 |
| 2117 | Cyril | 22621 LAKE FOREST DR | 800-221-1212 | ABRM | 1123 |
| 2118 | Cuthbert | 801 W FLORIDA AVE | 877-432-3473 | ABR | 1123 |
| 2119 | Coana | 8171 MARGUERITE PKWY | 800-367-5320 | AREP | 1245 |
| 2120 | Annette | 640 E 1ST ST | 800-652-6541 | ALHD | 1245 |
| 2121 | Burgh | 14001 NEWPORT AVE | 800-637-2247 | ASP | 1245 |
| 2122 | Cultra | 17080 BEAR VALLEY RD | 800-635-8787 | AHS | 1245 |
| 2123 | Glamis | 26503 GOLDEN VALLEY R | 808-873-0877 | AHWD | 1231 |
| 2124 | Hawick | 209 ELLA GRASSO TURNPIKE | 800-448-4226 | ABRM | 1231 |
| 2125 | Norwich | 51 E ALTAMONTE DR | 800-435-9792 | ABRM | 1231 |

**Second Normal Form of Relation 2: Property**

The Property relation is splits in to three separate relations

* Property
* Owner
* Property\_Owner

**Relation 3: Property**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Property**  **Id** | **Property**  **Address** | **State** | **City** | **Zip code** | **Rate** |
| 1189 | 11322 OLD SHELL & MCGREGO | AL | LOWEL | 75623 | 45,000 |
| 1156 | 6601 AIRPORT BLVD | AL | MALVERN | 75896 | 78,250 |
| 1147 | 11774 L ORANGE BEACH A T | AR | MARION | 74123 | 1,50000 |
| 1148 | 4725 MAIN S L FOLEY BEACH & CANA | AL | NORTH LITTLE ROCK | 78963 | 10,50000 |
| 1123 | 10951 L ROCKY RIDGE | AR | ROGERS | 74125 | 2,00000 |

**Relation 4: Owner**

|  |  |  |  |
| --- | --- | --- | --- |
| **Owner**  **Id** | **Owner**  **Name** | **Owner**  **Address** | **Owner**  **Phone** |
| 111 | Groby | 1167 LINCOLN AVE | 800-333-0276 |
| 112 | Kirkby | 1368 MADERA R Y | 866-266-5588 |
| 113 | Guildford | 1640 E 1ST S 1ST | 877-237-6627 |
| 114 | Hawick | 26503 GOLDEN VALLEY R | 800-237-6639 |
| 115 | Leigh | 4184 TWEEDY BLVD | 371 67006006 |
| 116 | Teston | 4184 TWEEDY BLVD | (+7317) 258-0950 |
| 117 | Welwyn | 4184 TWEEDY BLVD | 603 2171 9333 |
| 118 | Naas | 1620 MENDOCINO AVE | (044) 490-3490 |

**Relation 5: Property\_Owner**

|  |  |  |
| --- | --- | --- |
| Property\_Owner  Id | Property\_id | Owner\_id |
| 1121 | 1189 | 111 |
| 1126 | 1189 | 112 |
| 1122 | 1156 | 113 |
| 1123 | 1147 | 114 |
| 1127 | 1147 | 115 |
| 1124 | 1148 | 112 |
| 1128 | 1148 | 116 |
| 1129 | 1148 | 117 |
| 1125 | 1123 | 118 |

**What you need to do?**

You need to explore through the above tables and understand how each normalization is used.

You may add your own test cases and try out more scenarios until you become well versed and confident on the topic.