Proceso de Normalización

# Tabla Inicial

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| numSala | M2sala | ubiSala | tipoSala | codAparato | descAparato | edoAparato | salaAparato |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| descClase | diaClase | horaClase | codClase | salaClase | DNI | nomMonitor |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| telMonitor | titulo | experiencia | clasesImpartidas | numSocio | nomSocio | telSocio | dirSocio |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| profesionSocio | datosBancarios | clasesSocio | numPista | ubiPista | edoPista | fechaReserva |

|  |  |
| --- | --- |
| horaReserva | socioReserva |

# Primera Forma Normal

Para verificar que la tabla esté en 1FN, debemos asegurarnos que todos los dominios de todos los atributos sean atómicos.

* Dominios no-atomicos

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| numSala | M2sala | ubiSala | tipoSala | codAparato | descAparato | edoAparato | salaAparato |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| descClase | diaClase | horaClase | codClase | salaClase | DNI | nomMonitor |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| telMonitor | titulo | experiencia | clasesImpartidas | numSocio | nomSocio | telSocio | dirSocio |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| profesionSocio | datosBancarios | clasesSocio | numPista | ubiPista | edoPista | fechaReserva |

|  |  |
| --- | --- |
| horaReserva | socioReserva |

Para que *clasesImpartidas* se vuelva atómico, podemos agregar un atributo llamado *monitorClase* que relacione los atributos de clase a un monitor, ya que cada clase es impartida por un monitor.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| descClase | diaClase | horaClase | codClase | salaClase | monClase | DNI | nomMonitor |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| telMonitor | titulo | experiencia | numSocio | nomSocio | telSocio | dirSocio |

En el caso de *clasesSocio*, será necesario añanir otra tabla que relacione *numSocio* con *codClase*.

|  |  |
| --- | --- |
| **Asiste** |  |
| numSocio | codigoClase |

# Segunda Forma Normal

Para que las relaciones estén en 2FN, debemos verificar que están en 1FN (sí lo están), y que los atributos no-clave dependan por completo de la clave primaria, que ningún atributo dependa solamente de una porción de la llave primaria.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| numSala | M2sala | ubiSala | tipoSala | codAparato | descAparato | edoAparato | salaAparato |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| descClase | diaClase | horaClase | codClase | salaClase | monitorClase | DNI | nomMonitor |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| telMonitor | titulo | experiencia | numSocio | nomSocio | telSocio | dirSocio |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| profesionSocio | datosBancarios | numPista | ubiPista | edoPista | fechaReserva |

|  |  |
| --- | --- |
| horaReserva | socioReserva |

|  |  |
| --- | --- |
| **Asiste** |  |
| numSocio | codigoClase |

Hay que separar toda la tabla en sub-tablas de cada porción de clave primaria para que todos los atributos dependan de toda la clave primaria.

|  |  |  |  |
| --- | --- | --- | --- |
| **Aparato** |  |  |  |
| codAparato | descripAparato | estadoAparato | salaAparato |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sala** |  |  |  |
| numSala | M2Ocupa | ubicacionSala | tipoSala |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Clase** |  |  |  |  |  |
| codigoClase | diaClase | horaClase | descripClase | salaClase | monitorClase |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Monitor** |  |  |  |  |
| DNI | nombreMonitor | telMonitor | titulo | Experiencia |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Socio** |  |  |  |  |  |
| numSocio | nombreSocio | telSocio | dirSocio | profesionSocio | datosBancarios |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PistaSquash** |  |  |  |  |  |
| numPista | ubicacionPista | estadoPista | fechaReserva | horaReserva | socioReserva |

|  |  |
| --- | --- |
| **Asiste** |  |
| numSocio | codigoClase |

# Tercera Forma Normal

Una relación está en 3FN si está en 2FN y todos los atributos no-clave dependen de manera no transitiva de la clave primaria.

* Dependencias transitivas.

|  |  |  |  |
| --- | --- | --- | --- |
| **Aparato** |  |  |  |
| codAparato | descripAparato | estadoAparato | salaAparato |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sala** |  |  |  |
| numSala | M2Ocupa | ubicacionSala | tipoSala |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Clase** |  |  |  |  |  |
| codigoClase | diaClase | horaClase | descripClase | salaClase | monitorClase |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Monitor** |  |  |  |  |
| DNI | nombreMonitor | telMonitor | titulo | Experiencia |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Socio** |  |  |  |  |  |
| numSocio | nombreSocio | telSocio | dirSocio | profesionSocio | datosBancarios |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **PistaSquash** |  |  |  |  |  |
| numPista | ubicacionPista | estadoPista | fechaReserva | horaReserva | socioReserva |

|  |  |
| --- | --- |
| **Asiste** |  |
| numSocio | codigoClase |

Para eliminar la transitividad de las relaciones que contienen los atributos *salaAparato*, *salaClase,* y *monitorClase*, dichos atributos pueden sustiturse por sus respectivas claves primarias.

|  |  |  |  |
| --- | --- | --- | --- |
| **Aparato** |  |  |  |
| codAparato | descripAparato | estadoAparato | numSala |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sala** |  |  |  |
| numSala | M2Ocupa | ubicacionSala | tipoSala |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Clase** |  |  |  |  |  |
| codigoClase | diaClase | horaClase | descripClase | numSala | DNI |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Monitor** |  |  |  |  |
| DNI | nombreMonitor | telMonitor | titulo | Experiencia |

Para la relación de reservas con PistaSquash será necesario dividir la tabla PistaSquash de tal manera que su atributo en común sea numPista. Seguido de esto, cambiar el atributo *socioReserva* a su clave primaria respectiva.

|  |  |  |
| --- | --- | --- |
| **PistaSquash** |  |  |
| numPista | ubicacionPista | estadoPista |

|  |  |  |  |
| --- | --- | --- | --- |
| Reserva |  |  |  |
| numPista | fechaReserva | horaReserva | numSocio |

# Cuarta Forma Normal

Para que una relación este en 4FN, debe estar en 3FN y no tener dependencias de valores múltiples.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sala** |  |  |  |
| numSala | M2Ocupa | ubicacionSala | tipoSala |

|  |  |  |  |
| --- | --- | --- | --- |
| **Aparato** |  |  |  |
| codigoAparato | descrioAparato | estadoAparato | numSala |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Clase** |  |  |  |  |  |
| codigoClase | diaClase | horaClase | descripClase | numSala | DNI |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Monitor** |  |  |  |  |
| DNI | nombreMonitor | telMonitor | titulo | experiencia |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Socio** |  |  |  |  |  |
| numSocio | nombreSocio | telSocio | dirSocio | datosBancarios | profesionSocio |

|  |  |
| --- | --- |
| **Asiste** |  |
| codigoClase | numSocio |

|  |  |  |
| --- | --- | --- |
| **PistaSquash** |  |  |
| numPista | ubicacionPista | estadoPista |

|  |  |  |  |
| --- | --- | --- | --- |
| **Reserva** |  |  |  |
| numSocio | numPista | fechaReserva | horaReserva |

Aquí ya la tenemos en 4FN ya que todos los atributos dependen de la clave primaria y son independientes entre si. Aparte de que ninguna tupla puede contener valores múltiples acerca de una entidad.