1NF Normalization:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Book ID | Title | Author | Genre | Publisher | ISBN | Price |
| 101 | To Kill a Mockingbird | Harper Lee | Fiction | HarperCollins | 978-0061120084 | 10.99 |
| 102 | The Great Gatsby | F. Scott Fitzgerald | Fiction | Scribner | 978-0743273565 | 12.50 |
| 103 | Principles of Physics | Jearl Walker | Science | Wiley | 978-0321976444 | 50.00 |

The following table is already normalized to 1NF.

i) There are no repeating groups or multi valued attributes in the given table.

ii) Each attribute in the table contains atomic values.

2NF Normalization:

To normalize the table to 2NF we will create two tables, one is a Book table and the other is a publisher table. The reason for creating two tables is that we can remove partial dependencies.

Book table:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Book ID | Title | Author | Genre | ISBN | Price |
| 101 | To Kill a Mockingbird | Harper Lee | Fiction | 978-0061120084 | 10.99 |
| 102 | The Great Gatsby | F. Scott Fitzgerald | Fiction | 978-0743273565 | 12.50 |
| 103 | Principles of Physics | Jearl Walker | Science | 978-0321976444 | 50.00 |

We have created a separate Book table which contains information only related to Books.

Publisher Table:

|  |  |
| --- | --- |
| Publisher | ISBN |
| HarperCollins | 978-0061120084 |
| Scribner | 978-0743273565 |
| Wiley | 978-0321976444 |

We have also created a separate publisher table which contains information related to publishers and their ISBN's.

3NF Normalization: To normalize the table to 3NF we have to first convert the given table to 1NF, then we have to remove partial dependencies and finally we have to remove transitive dependencies. So we will make two tables -> one is a simple Book table where Book ID is the primary key.

Books table:

Book\_ID (Primary Key), ISBN, Price

|  |  |  |
| --- | --- | --- |
| BOOK\_ID | ISBN | Price |
| 101 | 978-0061120084 | 10.99 |
| 102 | 978-0743273565 | 12.50 |
| 103 | 978-0321976444 | 50.00 |

Book Details Table: This table will contain all information related to Books such as author, publisher, genre, title and ISBN as the primary key.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ISBN | Title | Author | Genre | Publisher |
| 978-0061120084 | To Kill a Mockingbird | Harper Lee | Fiction | HarperCollins |
| 978-0743273565 | The Great Gatsby | F. Scott Fitzgerald | Fiction | Scribner |
| 978-0321976444 | Principles of Physics | Jearl Walker | Science | Wiley |

Each table represents a distinct entity, with the Books table containing information specific to each book's ID, ISBN, and Price, while the Book Details table holds more detailed information such as Title, Author, Genre, and Publisher associated with each ISBN.