# The Book catalogue



Figure 1 Book Catalogue

A company holds a catalogue of books from a wide variety of publishers and in all formats, varying from printed (hardback, paperback, etc.) to electronic. The information on books is supplied by **publisher**s. The catalogue **organiser** maintains the publisher information, only allowing vetted publishers access to add new books. The catalogue organiser also maintains the bookCategorys and bookformats that can be allocated to books.

New books are added by one of the vetted publishers. The publisher can only add their own books, accessing the system using their PUBID and PPASSWORD. When the book (BOOK row) is added, the publisher chooses formats (BFORMAT) in which the book will be published, giving prices (PRICE) and release dates (RELEASE\_DATE) for each format in which the book will be published. The publisher picks the author from the list of authors in the system. If the author is not already in the system, the publisher can add the author, entering the First (authFName) and last name (authLName) of each author and entering a password for the author (APASSWORD). The author’s id (authid) is generated automatically. A publisher can also change his / her own password (PPASSWORD).

An **author** can access the system using his / her authId and password (apassword) and change his / her own biography (authBiog) and password (apassword).

**Members of the public** can view all information in the catalogue, except for passwords (apassword, ppassword), CategoryId, PubId and authid and reviewno. If a member of the public wishes to add a review, he / she can pick a book (ISBN) and add a review (up to 255 characters). An e-mail address must be provided also.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Category ID:** | JFIC | Category Description: | | | Children's Fiction | | |
|  |  |  |  |  |  |  |  |
| **ISBN** | **Title** | **No Pages** | **Auth Id** | **Author Name** | | **Publisher Id** | **Publisher Name** |
| 747532745 | Harry Potter and the Philosopher's Stone | 224 | 1 | J.K. | Rowling | BBRY | Bloomsbury |
| 747532745 | Harry Potter and the Philosopher's Stone | 224 | 1 | J.K. | Rowling | SCHO | Scholastic |
| 747546290 | Harry Potter and the Prisoner of Azkabhan | 320 | 1 | J.K. | Rowling | BBRY | Bloomsbury |
| 747546290 | Harry Potter and the Prisoner of Azkabhan | 320 | 1 | J.K. | Rowling | SCHO | Scholastic |
| 1904233651 | Twilight | 464 | 83 | Stephanie | Meyers | ATOM | ATOM |
| 1904233880 | New Moon | 479 | 83 | Stephanie | Meyers | ATOM | ATOM |
| 0007325983 | Skulduggery Pleasant Mortal Coil | 320 | 567 | Derek | Landy | HACO | Harper Collins |
| 0007382197 | The Night Before The Night Before Christmas | 48 | 484 | Richard | Scarry | HACO | Harper Collins |

Figure 2 List of Children’s fiction titles.

2. The cataloguing company received this report which may cause them to reorganise the structure of their tables. A close look at the data shows that some titles are published by more than one publisher, and the number of pages in the book depends on who is publishing it. In order to come up with the new structure, normalisation is required. Please note that the titles ‘Harry Potter and the ...’ also appear on the List of Junior adventure titles (JADV).

(a) Represent the report in unnormalised form, first normal form, second normal form and third normal form.. (4x5 marks)

(b) Draw an Entity Relationship diagram of the third normal form, giving the forms meaningful names. (5 marks)

(c) Explain why forms are normalized. (5 marks)

FORM = CATID + CATDESC + {ISBN + TITLE + NOPAGES + AUTHID + AUTHNAME + PUBID + PUBNAME}

INF:

Rules:

* Separate repeating groups from the main form (FORM) calling the new form F1.
* Add the key to FORM to the F1, marking it as a foreign key.
* Find the key to F1.

FORM = CATID + CATDESC

F1 = CATID\* + ISBN + TITLE + NOPAGES + AUTHID + AUTHNAME + PUBID + PUBNAME

2NF:

Rules:

* For ANY FORM THAT HAS A COMPOUND KEY, CHECK THE NON-KEY ATTRIBUTES.
  + If THEY ARE ONLY DEPENDENT ON A SUBSET OF THE KEY, FORM A NEW FORM (F2 ,ETC) WITH THE SUB-KEY AS ITS PRIMARY KEY.
  + Mark THE KEY AS FOREIGN IN THE INITIAL FORM. Move THE DEPENDENT ATTRIBUTES TO THE NEW FORM.

FORM = CATID + CATDESC

F1 = CATID\* + ISBN\*

f2 = ISBN + TITLE + NOPAGES + AUTHID + AUTHNAME + PUBID + PUBNAME

3nf:

Look at non-key attributes (only forms that have > 1 non-key attribute need be considered). if one depends on another, copy the determining set of attributes to a new form marking them as foreign in the original.

Move the dependent attributes to the new form.

FORM = CATID + CATDESC

F1 = CATID\* + ISBN\*

f2 = ISBN + TITLE + NOPAGES + AUTHID\* + PUBID\*

f3 = pubid + PUBNAME

F4 = AUTHID + AUTHNAME