**Database design**

**Database Design Statute：**

1. Fields that express the concept of yes or no must be named is\_xxx with unsigned tinyint data type (1 for yes, 0 for no).

Note: Any field that is non-negative must be unsigned, the is\_xxx nomenclature is adhered to in order to clarify the meaning and range of values.

Example: A field name expressing logical deletion is\_deleted, where 1 means deleted and 0 means not deleted.

1. Table names and field names must be in lower case letters or numbers, and it is forbidden to start with a number or to have only a number between two underscores. Database field names can be costly to modify, and field names need to be considered carefully.

Note: MySQL is case-insensitive under Windows, but is case-sensitive by default under Linux. Therefore, database names, table names and field names are not allowed to have any capital letters in them to avoid any extraneous problems.

1. Table names do not use plural nouns.

Note: The table name should only indicate the content of the entities inside the table, not the number of entities, and corresponds to the DO class name in the singular form, in line with the expression convention.

1. To disable reserved words such as desc, range, match, delayed, etc., please refer to the official MySQL reserved words.
2. The primary key index is the name of the pk\_ field; the unique index is the name of the uk\_ field; and the common index is the name of the idx\_ field.

Note: pk\_ is the primary key; uk\_ is the unique key; idx\_ is short for index.

1. The decimal type is decimal and float and double are prohibited.

Note: Both float and double suffer from a loss of precision when stored and may give incorrect results when comparing values. If you are storing data in a range other than decimal, it is recommended that you split the data into integers and decimals and store them separately.

1. If the stored strings are almost equal in length, use the char fixed-length string type.
2. varchar is a variable-length string that is not pre-allocated storage space and should not exceed 5000 in length. If the storage length is greater than this value, define the field type as text and separate it out into a table with a primary key to avoid affecting the efficiency of other field indexes.
3. The table must have three fields: id, create\_time, update\_time.

Note: The id must be the primary key, of type bigint unsigned, self-incrementing for a single table, and in steps of 1. The create\_time and update\_time are both of type datetime, the former in the present tense for active creation, the latter in the past participle for passive update.

When updating a data table record, you must also update the update\_time field of the record to the current time.

1. The naming of tables should preferably follow the "business name\_table\_role".

Example: book\_info / book\_chapter / user\_bookshelf / user\_comment / author\_info

1. The library name and the application name should match as closely as possible.
2. Field comments need to be updated promptly if the meaning of a field is changed or if the status represented by a field is appended.
3. Fields are allowed to be appropriately redundant to improve query performance, but data consistency must be considered. Redundant fields should follow:

Not fields that are frequently modified.

Not a uniquely indexed field.

Not a varchar extra-long field, much less a text field.

1. Fields that are unique in business, even if they are combined fields, must be uniquely indexed.
2. Forbid join for more than three tables, keep the data types of the fields to be joined absolutely identical, and ensure that the fields to be joined are indexed when querying multiple tables.

Note: Pay attention to table indexes and SQL performance even for two-table joins.

1. When creating an index on a varchar field, you must specify the length of the index, it is not necessary to create an index on the whole field, according to the actual text distinction to determine the length of the index.
2. Note: The length of an index and the degree of distinction are an oxymoron. Generally for string type data, an index of length 20 will have a distinction of 90% or more, which can be determined by using the distinction of count(distinct left(column name, index length))/count(\*).
3. Avoid the following extreme misconceptions when creating indexes:

It is better to have an index than an index. Think that one query requires one index to be built.

Skimp on index creation. Think that indexes consume space and severely slow down the updating of records and the addition of rows.

Resist unique indexes. Believes that unique indexes should always be solved at the application level by "lookup before insertion".

**Summary of system functions**

**Home:** Rotation chart, recommendation of the week, popular recommendation, fine recommendation, click list, new book list, updated list, latest news, friend link, feedback message

**News module:** News category, news list, news reading

**Novel Search:** Search novels according to keywords such as book title, author name and filtering conditions such as channel, category, finished or not, word count, update mode

**Novel details page:** Novel information display, author information display, latest chapter summary, latest reviews, comments, add to bookshelf, similar recommendations

**Novel Comments Page:** Novel comments section, comments display, post comments

**Contents page:** Contents of the novel

**Novel content page:** Subscribe to novel chapters, read novel content, comment on novel paragraphs

**Ranking:** Click list, update list, new book list, review list

**Author Module:** Register as a writer, publish your work and manage chapters

**Database relationship diagram**

**Home Module**

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| --- | --- | --- | --- |
| **Home\_book** | | | |
| id |  | PK | BIGINT UNSIGNED |
| type | Type of recommendation |  | TINYINT UNSIGNED |
| sort | Order of recommendation |  | TINYINT UNSIGNED |
| book\_id | ID of recommended novel | FK | BIGINT UNSIGNED |
| create\_time | Time of creating novels |  | DATETIME |
| update\_time | Time of updating novels |  | DATETIME |

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| --- | --- | --- | --- | --- |
| **Book\_info** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| Work\_direction | Direction of novel |  | TINYINT UNSIGNED |  |
| Category\_id | Id of category |  | BIGINT UNSIGNED |  |
| category\_name | Name of category |  | VARCHAR | 50 |
| pic\_url | url of cover of novel |  | VARCHAR | 200 |
| book\_name | Name of novel |  | VARCHAR | 50 |
| author\_id | Id of author |  | BIGINT UNSIGNED |  |
| author\_name | Name of author |  | VARCHAR | 50 |
| book\_desc | Description of novel |  | VARCHAR | 2000 |
| score | Score of novels |  | TINYINT UNSIGNED |  |
| book\_status | Status of novel |  | TINYINT UNSIGNED |  |
| visit\_count | Amount of visit times |  | BIGINT UNSIGNED |  |
| word\_count | Number of words in total |  | INT UNSIGNED |  |
| comment\_count | Number of comments |  | INT UNSIGNED |  |
| last\_chapter\_id | Id of the last chapter |  | BIGINT UNSIGNED |  |
| last\_chapter\_name | Name of the last chapter |  | VARCHAR | 50 |
| last\_chapter\_update\_time | Updating time of the last chapter |  | DATETIME |  |
| is\_vip | Paid novel or not |  | TINYINT UNSIGNED |  |
| create\_time | Creating time of novel |  | DATETIME |  |
| update time | Updating time of novel |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **Home\_friend\_link** | | | | |
| Id |  | <PK> | BIGINT UNSIGNED |  |
| link\_name | Name of url of novel |  | VARCHAR | 50 |
| link\_url | url of novel |  | VARCHAR | 100 |
| sort | Index of order |  | TINYINT UNSIGNED |  |
| Is\_open | The novel is open or not |  | TINYINT UNSIGNED |  |
| Create\_time | Creating time of novel |  | DATETIME |  |
| Update\_time | Updating time of novel |  | DATETIME |  |

**News Module**

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| --- | --- | --- | --- | --- |
| **News\_category** | | | | |
| Id |  | <PK> | BIGINT UNSIGNED |  |
| Name | Name of category |  | VARCHAR | 20 |
| Sort | Index of order |  | TINYINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **News\_info** | | | | |
| Id |  | <PK> | BIGINT UNSIGNED |  |
| Category\_id | Id of category of news | <FK> | BIGINT UNSIGNED |  |
| Categpry\_name | Name of category of news |  | VARCHAR | 50 |
| Source\_name | Source of news |  | VARCHAR | 50 |
| title | Title of news |  | VARCHAR | 100 |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **News\_content** | | | | |
| Id |  | <PK> | BIGINT UNSIGNED |  |
| News\_id | Id of news | <FK> | BIGINT UNSIGNED |  |
| Content | Content of news |  | MEDIUMTEXT |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

**Novel Module**

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| --- | --- | --- | --- | --- |
| **Book\_category** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| Work\_direction | Direction of novel |  | TINYINT UNSIGNED |  |
| Name | Name of category |  | VARCHAR | 20 |
| Sort | Index of order |  | TINYINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **Author\_info** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| User\_id | Id of users | FK | BIGINT UNSIGNED |  |
| Invite\_code | The code of a new author joining in this platform | FK | VARCHAR | 20 |
| Pen\_name | Pen name of an author |  | VARCHAR | 20 |
| Tel\_phone | Telephone number of an author |  | VARCHAR | 20 |
| Chat\_account | QQ number or WeChat number of an author |  | VARCHAR | 50 |
| Email | Email of an author |  | VARCHAR | 50 |
| Work\_direction | Direction of a novel |  | TINYINT UNSIGNED |  |
| status | 0 represents normal status |  | TINYINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **Book\_info** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| Work\_direction | Direction of novel |  | TINYINT UNSIGNED | N |
| Category\_id | Id of category |  | BIGINT UNSIGNED |  |
| category\_name | Name of category |  | VARCHAR | 50 |
| pic\_url | url of cover of novel |  | VARCHAR | 200 |
| book\_name | Name of novel |  | VARCHAR | 50 |
| author\_id | Id of author |  | BIGINT UNSIGNED |  |
| author\_name | Name of author |  | VARCHAR | 50 |
| book\_desc | Description of novel |  | VARCHAR | 2000 |
| score | Score of novels |  | TINYINT UNSIGNED |  |
| book\_status | Status of novel |  | TINYINT UNSIGNED |  |
| visit\_count | Amount of visit times |  | BIGINT UNSIGNED |  |
| word\_count | Number of words in total |  | INT UNSIGNED |  |
| comment\_count | Number of comments |  | INT UNSIGNED |  |
| last\_chapter\_id | Id of the last chapter |  | BIGINT UNSIGNED |  |
| last\_chapter\_name | Name of the last chapter |  | VARCHAR | 50 |
| last\_chapter\_update\_time | Updating time of the last chapter |  | DATETIME |  |
| is\_vip | Paid novel or not |  | TINYINT UNSIGNED |  |
| create\_time | Creating time of novel |  | DATETIME |  |
| update time | Updating time of novel |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **Book\_chapter** | | | | |
| id |  | PK | BIGINT UNSIGNED |  |
| Book\_id | Id of a novel | FK | BIGINT UNSIGNED |  |
| Chapter\_num | Number of a chapter |  | SMALLINT UNSIGNED |  |
| Chapter\_name | Name of a chapter |  | VARCHAR | 100 |
| word\_count | Number of words in a chapter |  | INT UNSIGNED |  |
| is\_vip | Paid novel or not |  | TINYINT UNSIGNED |  |
| create\_time | Creating time of novel |  | DATETIME |  |
| update time | Updating time of novel |  | DATETIME |  |
| **Book\_content** | | | | |
| id | Primary key | PK | BIGINT UNSIGNED |  |
| Chapter\_id | Id of a chapter | FK | BIGINT UNSIGNED |  |
| Content | Content of a chapter |  | MEDIUMTEXT |  |
| create\_time | Creating time of novel |  | DATETIME |  |
| update time | Updating time of novel |  | DATETIME |  |
| **Book\_comment** | | | | |
| id | Primary key | PK | BIGINT UNSIGNED |  |
| Book\_id | Id of a novel | FK | BIGINT UNSIGNED |  |
| User\_id | Id of users |  | BIGINT UNSIGNED |  |
| Comment\_content | Content of a comment |  | VARCHAR | 512 |
| Reply\_count | Number of replies under a comment |  | INT UNSIGNED |  |
| Audit\_status | Status of a comment that if this comment is approved by our platform |  | TINYINT UNSIGNED |  |
| create\_time | Creating time of novel |  | DATETIME |  |
| update time | Updating time of novel |  | DATETIME |  |

**User Module**

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| **User\_feedback** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED | N |
| User\_id | Id of user who gives feedback | FK | BIGINT UNSIGNED |  |
| content | Content of feedback |  | VARCHAR | 512 |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |
| **User\_pay\_log** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| User\_id | Id of user who charged | FK | BIGINT UNSIGNED | N |
| Pay\_channel | The way of users paying |  | TINYINT UNSIGNED |  |
| Out\_trade\_no | number of orders of provider |  | VARCHAR | 64 |
| Amount | Amount of money a use paid |  | INT UNSIGNED |  |
| Product\_type | Type of the product |  | TINYINT UNSIGNED |  |
| Product\_id | Id of the product |  | BIGINT UNSIGNED |  |
| Product\_name | Name of the product |  | VARCHAR | 255 |
| Product\_value | Value of the product |  | INT UNSIGNED |  |
| Pay\_time | Time of users paying |  | DATETIME |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |
| **User\_consume\_log** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED | N |
| User\_id | Id of user who bought production | FK | BIGINT UNSIGNED |  |
| Amount | Amount of money users paid for production |  | INT UNSIGNED |  |
| Product\_value | Value of the product |  | TINYINT UNSIGNED |  |
| Product\_id | Id of the product |  | BIGINT UNSIGNED |  |
| Product\_name | Name of the product |  | VARCHAR | 50 |
| Product\_value | Value of the product |  | INT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **User\_info** | | | | |
| Id  1 | Primary key | PK | BIGINT UNSIGNED |  |
| username | Name of a user |  | VARCHAR | 50 |
| password | Password for login |  | VARCHAR | 100 |
| salt | salt |  | VARCHAR | 8 |
| Nick\_name | Nick name |  | VARCHAR | 50 |
| User\_photo | User avatar |  | VARCHAR | 100 |
| User\_sex | Gender of users |  | TINYINT UNSIGNED |  |
| Account\_balance | Balance of an account |  | BIGINT UNSIGNED |  |
| status | Status of an account |  | TINYINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **User\_bookshelf** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| User\_id | Id of users | FK | BIGINT UNSIGNED |  |
| Book\_id | Id of a book | FK | BIGINT UNSIGNED |  |
| Pre\_content\_id | The id of the chapter this user read last time |  | BIGINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |
| **User\_read\_history** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| User\_id  N | Id of users | FK | BIGINT UNSIGNED |  |
| Book\_id | Id of a book | FK | BIGINT UNSIGNED |  |
| Pre\_content\_id | The id of the chapter this user read last time |  | BIGINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |
| **Book\_comment** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| Book\_id | Id of a book which is given a comment | FK | BIGINT UNSIGNED |  |
| User\_id | Id of users who give comments | FK | BIGINT UNSIGNED |  |
| Comment\_content | The content of a comment |  | VARCHAR | 512 |
| Reply\_count | The total number of comments of this book |  | INT UNSIGNED |  |
| Audit\_status | Whether this comment is approved by our platform |  | TINYINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **User\_bookshelf** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED | N |
| User\_id | Id of users | FK | BIGINT UNSIGNED |  |
| Book\_id | Id of a book | FK | BIGINT UNSIGNED |  |
| Pre\_content\_id | The id of the chapter this user read last time |  | BIGINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |
| **User\_read\_history** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| User\_id | Id of users | FK | BIGINT UNSIGNED |  |
| Book\_id | Id of a book | FK | BIGINT UNSIGNED | N |
| Pre\_content\_id | The id of the chapter this user read last time |  | BIGINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |
| **Book\_comment** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| Book\_id | Id of a book which is given a comment | FK | BIGINT UNSIGNED | N |
| User\_id | Id of users who give comments | FK | BIGINT UNSIGNED |  |
| Comment\_content | The content of a comment |  | VARCHAR | 512 |
| Reply\_count | The total number of comments of this book |  | INT UNSIGNED |  |
| Audit\_status | Whether this comment is approved by our platform |  | TINYINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **Book\_info** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| Work\_direction  1 | Direction of novel |  | TINYINT UNSIGNED |  |
| Category\_id | Id of category |  | BIGINT UNSIGNED |  |
| category\_name | Name of category |  | VARCHAR | 50 |
| pic\_url | url of cover of novel |  | VARCHAR | 200 |
| book\_name | Name of novel |  | VARCHAR | 50 |
| author\_id | Id of author |  | BIGINT UNSIGNED |  |
| author\_name | Name of author |  | VARCHAR | 50 |
| book\_desc | Description of novel |  | VARCHAR | 2000 |
| score | Score of novels |  | TINYINT UNSIGNED |  |
| book\_status | Status of novel |  | TINYINT UNSIGNED |  |
| visit\_count | Amount of visit times |  | BIGINT UNSIGNED |  |
| word\_count | Number of words in total |  | INT UNSIGNED |  |
| comment\_count | Number of comments |  | INT UNSIGNED |  |
| last\_chapter\_id | Id of the last chapter |  | BIGINT UNSIGNED |  |
| last\_chapter\_name | Name of the last chapter |  | VARCHAR | 50 |
| last\_chapter\_update\_time | Updating time of the last chapter |  | DATETIME |  |
| is\_vip | Paid novel or not |  | TINYINT UNSIGNED |  |
| create\_time | Creating time of novel |  | DATETIME |  |
| update time | Updating time of novel |  | DATETIME |  |

**Author module**

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| --- | --- | --- | --- | --- |
| **User\_info [Information of users]** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| username | Name of a user |  | VARCHAR | 50 |
| password | Password for login |  | VARCHAR | 100 |
| salt | salt |  | VARCHAR | 8 |
| Nick\_name | Nick name |  | VARCHAR | 50 |
| User\_photo | User avatar |  | VARCHAR | 100 |
| User\_sex | Gender of users |  | TINYINT UNSIGNED |  |
| Account\_balance | Balance of an account |  | BIGINT UNSIGNED |  |
| status | Status of an account |  | TINYINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **Author\_code [Invited code of authors]** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| Invite\_code | The code of a new author joining in this platform |  | VARCHAR | 100 |
| Validity\_time | The expiration of this code |  | DATETIME |  |
| Is\_used | Whether this code is used |  | TINYINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **Author\_info [Information of authors]**  1 | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| User\_id | Id of users | FK | BIGINT UNSIGNED |  |
| Invite\_code | The code of a new author joining in this platform | FK | VARCHAR | 20 |
| Pen\_name | Pen name of an author |  | VARCHAR | 20 |
| Tel\_phone | Telephone number of an author |  | VARCHAR | 20 |
| Chat\_account | QQ number or WeChat number of an author |  | VARCHAR | 50 |
| Email | Email of an author |  | VARCHAR | 50 |
| Work\_direction | Direction of a novel |  | TINYINT UNSIGNED |  |
| status | 0 represents normal status |  | TINYINT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |

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| --- | --- | --- | --- | --- |
| **Author\_income [in total]** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| Author\_id | The id of this author | FK | BIGINT UNSIGNED |  |
| Book\_id | The id of this book |  | BIGINT UNSIGNED |  |
| Income\_month | The number of months of this book that makes income |  | DATE |  |
| Pre\_tax\_income | Income including tax |  | INT UNSIGNED |  |
| After\_tax\_income | Income excluding tax |  | INT UNSIGNED |  |
| Pay\_status | The status of paying |  | TINYINT UNSIGNED |  |
| Confirm\_status | The confirm status of income |  | TINYINT UNSIGNED |  |
| Detail | Detail |  | VARCHAR | 255 |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |
| **Author\_income\_detail [in detail]** | | | | |
| Id | Primary key | PK | BIGINT UNSIGNED |  |
| Author\_id | The id of this author | FK | BIGINT UNSIGNED |  |
| Book\_id | The id of this book |  | BIGINT UNSIGNED |  |
| Income\_date | The date of getting income |  | DATE |  |
| Income\_account | The total number of subscriptions |  | INT UNSIGNED |  |
| Income\_count | The times of subscription |  | INT UNSIGNED |  |
| Income\_number | The number of subscribed users |  | INT UNSIGNED |  |
| Create\_time | Creating time of news |  | DATETIME |  |
| Update\_time | Updating time of news |  | DATETIME |  |