Assumptions are made at various points since enough information in not available in the question.

Below are the table names with description:

* Role

It is a master table that consists of following data. Role ID is used to reference in User Table. Maximum Days is how long can the items be issued. Maximum Items is at most how many resources can be issued.

|  |  |  |  |
| --- | --- | --- | --- |
| Role\_id | Role\_name | Maximum\_days | Maximum\_items |
| 1 | Faculty | 120 | 300 |
| 2 | Graduate | 120 | 150 |
| 3 | Undergraduate | 21 | 5 |
| 4 | Guest | 10 | 3 |

* Department

Master table. Department ID is referenced in User.

|  |  |
| --- | --- |
| Department\_id | Department\_name |
| 1 | Computer Science |
| 2 | Software Engineering |
| 3 | Mechanical Engineering |
| 4 | Electrical Engineering |

* Contact Method

Master table. Using contact\_id in User Contact.

|  |  |
| --- | --- |
| Contact\_id | Contact\_type |
| 1 | Mobile Number |
| 2 | Office Number |
| 3 | Home Number |
| 4 | Home Address |
| 5 | Office Address |
| 6 | Personal Email |
| 7 | Work Email |

* User Contact Details

This table holds user contact data. Linked with netid in User and contact\_id in Contact Method.

Sample Data:

|  |  |  |  |
| --- | --- | --- | --- |
| netID | Contact\_id | Value | Country (nullable) |
| Vxk180003 | 1 | 1234567890 | United States |
| Vxk180003 | 5 | Civil Lines, Pune | India |
| Vxk180003 | 6 | [Vedantkumar.007@gmail.com](mailto:Vedantkumar.007@gmail.com) | Null |
| Pxk150009 | 4 | Cavalier Dr, Richardson | United States |

* User

This table binds all user information. Assuming, Gender will always be Male and Female. When Is\_active value is false, it means alumni.

Sample Data:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| netID | UTDID | Name | Role\_id | Gender | Department\_id | Is\_active |
| Vxk180003 | 123456 | Vedant Kumar | 2 | M | 1 | True |
| Jxk170001 | 543216 | John Cole | 1 | M | 1 | True |
| Hxp160041 | 789456 | Jenny Hole | 3 | F | 3 | False |

* Resources

Master data for all kind of available resources in the library. See sample data to know subset of kind of resources in library. Assuming, Fine\_per\_day and maximum\_fine can be fine-tuned depending upon resource type.

Sample Data:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| resource\_id | Resource\_type | Fine\_per\_day (nullable) | Maximum\_fine (nullable) | Is\_loanable |
| 1 | Paperback Books | .5 | 50 | True |
| 2 | e-Books | Null | Null | False |
| 3 | Hardbound Books | .5 | 50 | True |
| 4 | Magazines | .5 | 50 | True |
| 5 | Journals | .25 | 25 | True |
| 6 | Rare Books | Null | Null | False |
| 7 | Laptop | 5 | 100 | True |
| 8 | Calculators | 2 | 20 | True |
| 9 | Manuscripts | Null | Null | False |
| 10 | CD | 1 | 20 | True |
| 11 | DVD | 1 | 20 | True |

* Composer

This table which consists of all authors of all books, crew and cast of all CDs and DVDs, and even manufacturer of calculator and laptop. An assumption is made that person name is not same with same profession. Set a unique constraint to the combination of name and profession fields.

Sample Data:

|  |  |  |
| --- | --- | --- |
| Composer\_id | Name | Profession (nullable) |
| 1 | John Cole | Author |
| 2 | David Guetta | Musician |
| 3 | Brad Pitt | Actor |
| 4 | Sai Ram | Author |
| 5 | Barack Obama | Director |
| 6 | Donald Trump | Producer |
| 7 | Dell | null |

* Publisher

This table consists of all publishers whose published books are available in the library. If a publisher exists, then it’s published book will also exist.

Sample Data:

|  |  |
| --- | --- |
| Publisher\_id | Publisher\_name |
| 1 | Frank publications |
| 2 | Safari Online |
| 3 | McGraw |

* Genre

Master Data to know all types of available genres in the library. If any type of Genre exists, then a resource must also exist.

Sample Data:

|  |  |
| --- | --- |
| Genre\_id | Genre\_name |
| 1 | Fiction |
| 2 | Non-Fiction |
| 3 | Poetry |

* Resource Details

This table holds the details of every resource available in the library.

An assumption is made that ISBN can be different for every edition and each paper type resource has ISBN. A publisher can be changed for every edition but same for each edition. Authors can be changed for every edition. Publication Date is same for each edition. All books with same ISBN are kept together.

Sample Data:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ISBN | Resource\_id | title | Edition  (nullable) | Publication\_date | Publisher\_id | Available\_Copies | Dewey\_decimal\_system\_number (nullable) | Congress\_catalogue\_number | Pages | Item\_type | description |
| “123456” | 3 | Introduction to Algorithm | 2 | 08-28-2010 | 1 | 5 | XXXX | ZZZZ | 500 | 1 | For CS folks |

* User Loaned Details

This table holds information when a resource is issued to a user. Fine is calculated and updated after each day by scheduling. Due\_date is set based on current\_date + maximum\_days of role table. An assumption is made that multiple copies of the same book cannot be issued to the same user.

Sample Data:

|  |  |  |  |
| --- | --- | --- | --- |
| ISBN | Netid | Due\_date | Fine (derived attribute) |
| “123456” | Vxk180003 | 12/12/2019 | Null |
| “541245” | Pxk180012 | 07/07/2019 | 50 |

* Resource Composer

This table maps the author of the book. An assumption is made that title of the book is unique.

Sample Data:

|  |  |
| --- | --- |
| Composer\_id | title |
| 1 | “123456” |
| 2 | “456123” |
| 3 | Star Wars |

* Digital Resource Details

This table is used to maintain details of CD, DVD resources. The parent entity is Resources.

Sample Data:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Movie\_title | Resource\_id | Running\_time | Year | Genre\_id | Storyline | Congress\_cat\_num |
| Star Wars | 10 | 115 | 1996 | 2 | “Alien War” | xxxxx |
| Iron Man | 11 | 150 | 1999 | 3 | “Super hero” | xxxxx |