Library Management Module

Introduction

This custom Odoo module is developed to provide a comprehensive solution for managing a library system. It enables seamless management of books and authors, alongside an efficient borrowing flow that tracks book loans and returns. The module enhances user experience with an intuitive menu structure, allowing users to easily navigate between Books, Authors, and Borrowing Records.

Environment Setup and Dependencies

Before starting the development of the *Library Management* module, it was essential to prepare a complete Odoo development environment. This includes installing and configuring several core tools and dependencies required to run Odoo 18.0 smoothly on a Linux-based system (e.g., Ubuntu).

The setup ensures that the system is fully equipped to support Odoo's backend, PostgreSQL database, and the virtual Python environment where all dependencies are managed.

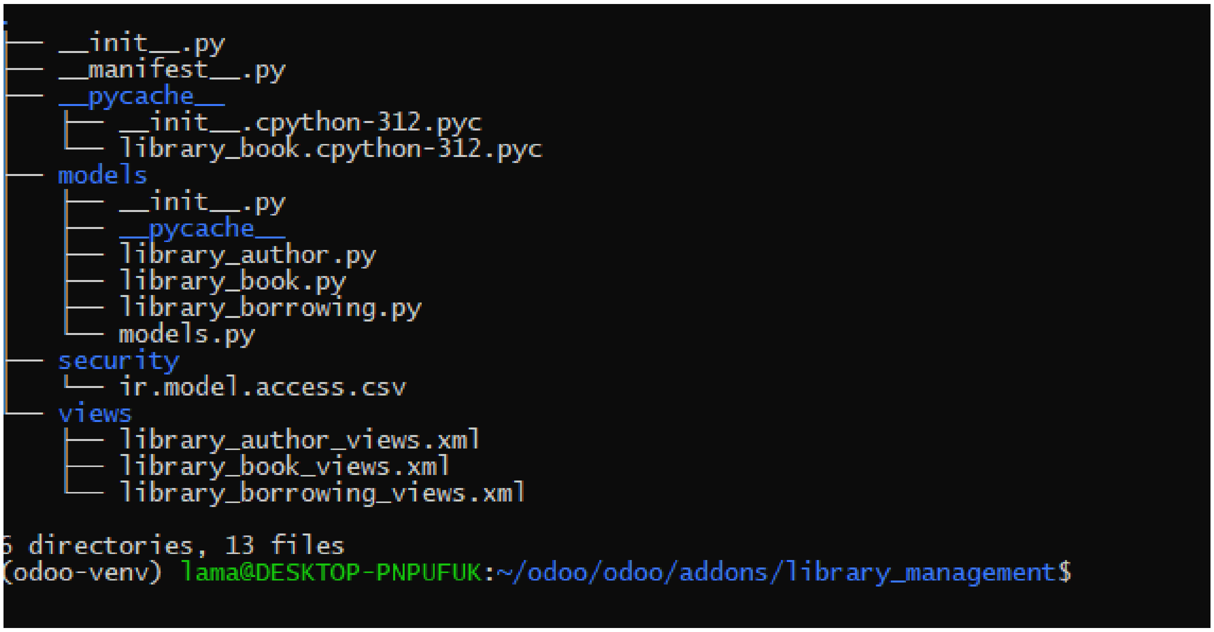
The following components were installed and configured:

- **Python 3.12+**: Required for running Odoo core.
- **PostgreSQL**: Odoo uses PostgreSQL as its database engine.
- **Odoo 18.0 (Community Edition)**: The main open-source ERP framework.
- **Git**: To clone the Odoo source code from GitHub.
- **Odoo Configuration File (`odoo.conf`)**: Created for server settings and database connection.

All the components were installed manually to give full control over the development environment and ensure compatibility with custom modules.

Module Structure and Development

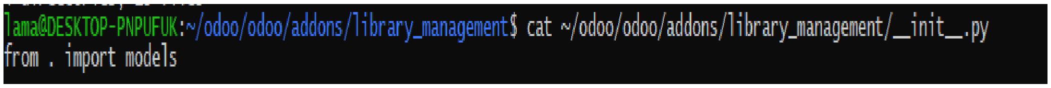
After setting up the development environment, the custom module was created under the following standard Odoo structure. Below is a description of each key file and its role in the module:



```
.
├── __init__.py
├── __manifest__.py
├── __pycache__
│   ├── __init__.cpython-312.pyc
│   └── library_book.cpython-312.pyc
├── models
│   ├── __init__.py
│   ├── __pycache__
│   ├── library_author.py
│   ├── library_book.py
│   ├── library_borrowing.py
│   └── models.py
├── security
│   └── ir.model.access.csv
└── views
    ├── library_author_views.xml
    ├── library_book_views.xml
    └── library_borrowing_views.xml

5 directories, 13 files
(odoo-venv) lama@DESKTOP-PNPUFUK:~/odoo/odoo/addons/library_management$
```

1)__init__.py

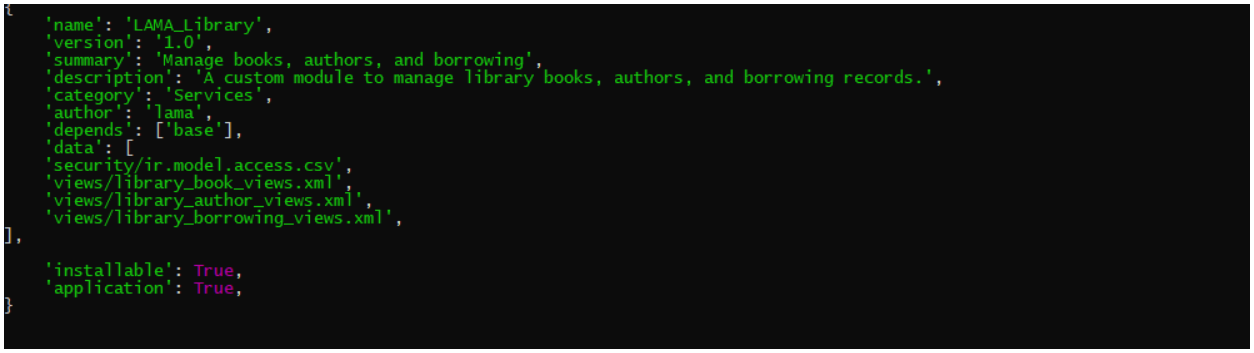
Initializes the Python package and tells Odoo which Python modules to load**.**



```
lama@DESKTOP-PNPUFUK:~/odoo/odoo/addons/library_management$ cat ~/odoo/odoo/addons/library_management/__init__.py
from . import models
```

2)__manifest__.py

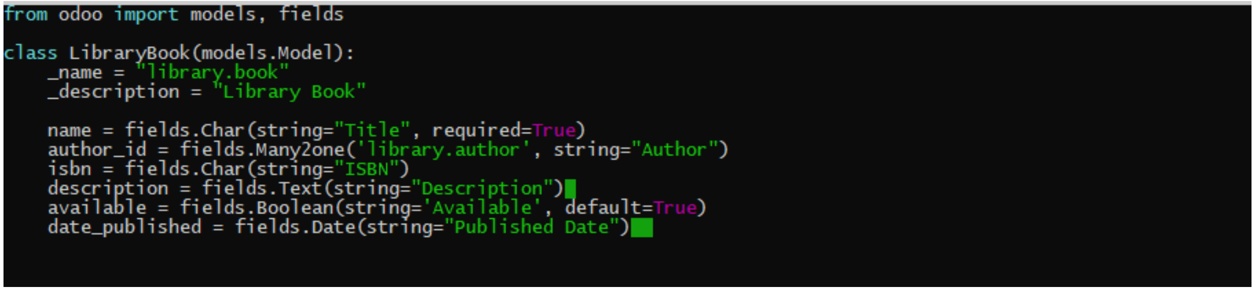
Contains the module metadata such as name, version, dependencies, and the list of files (views, security, etc.) to be loaded.



```
{
    'name': 'LAMA_Library',
    'version': '1.0',
    'summary': 'Manage books, authors, and borrowing',
    'description': 'A custom module to manage library books, authors, and borrowing records.',
    'category': 'Services',
    'author': 'lama',
    'depends': ['base'],
    'data': [
    'security/ir.model.access.csv',
    'views/library_book_views.xml',
    'views/library_author_views.xml',
    'views/library_borrowing_views.xml',
],

    'installable': True,
    'application': True,
}
```

3) `models/library_book.py`

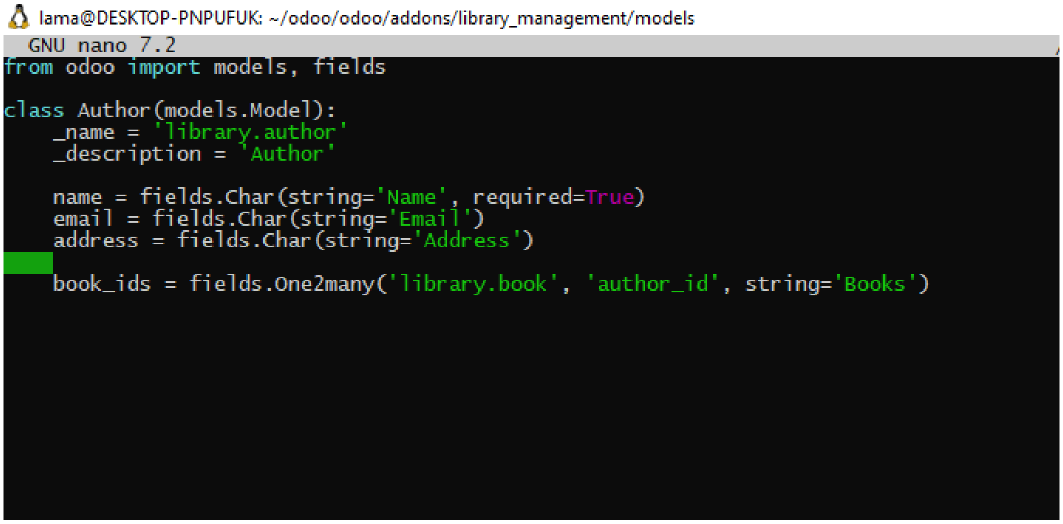
Defines the `library.book` model with fields like title, author, description, publish date, and availability.



```
from odoo import models, fields

class LibraryBook(models.Model):
    _name = "library.book"
    _description = "Library Book"

    name = fields.Char(string="Title", required=True)
    author_id = fields.Many2one('library.author', string="Author")
    isbn = fields.Char(string="ISBN")
    description = fields.Text(string="Description")
    available = fields.Boolean(string='Available', default=True)
    date_published = fields.Date(string="Published Date")
```

4) `models/library_author.py`

Defines the `library.author` model with author information, mainly the name field.

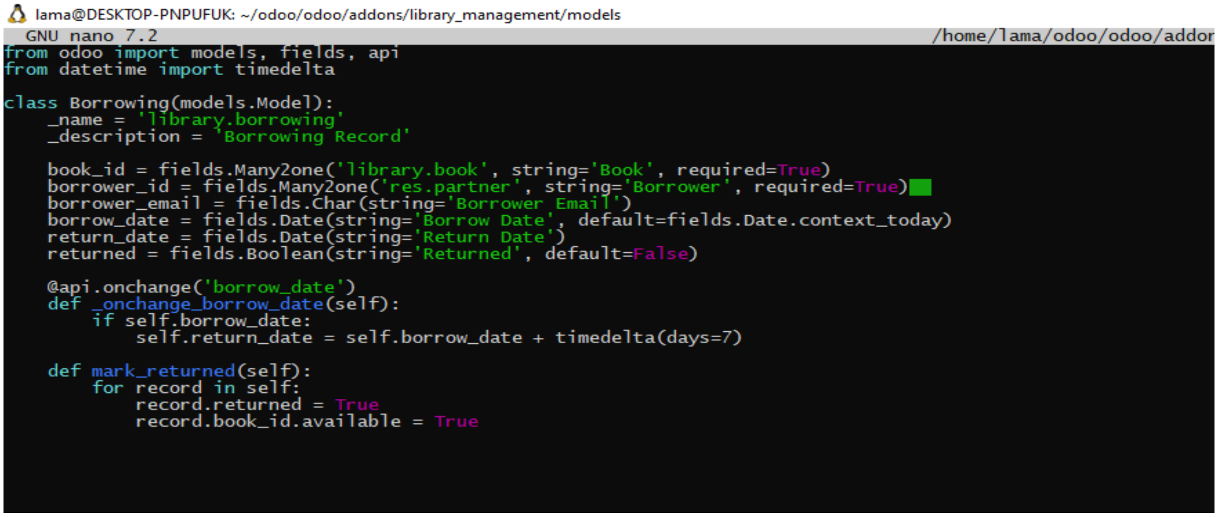


lama@DESKTOP-PNPUFUK: ~/odoo/odoo/addons/library_management/models

```
  GNU nano 7.2
from odoo import models, fields

class Author(models.Model):
    _name = 'library.author'
    _description = 'Author'

    name = fields.Char(string='Name', required=True)
    email = fields.Char(string='Email')
    address = fields.Char(string='Address')

    book_ids = fields.One2many('library.book', 'author_id', string='Books')
```

5)models/library_borrowing.py

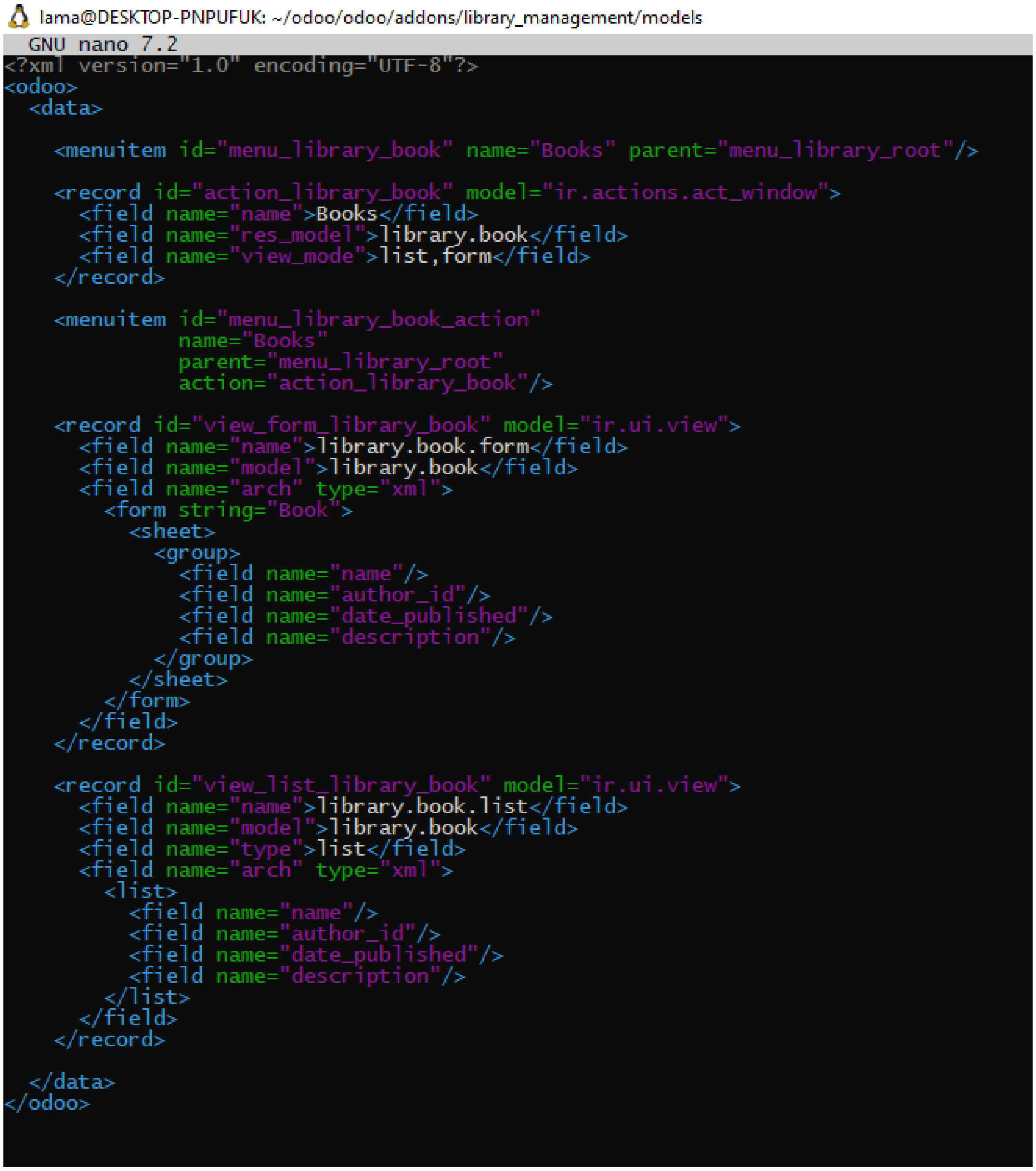
Defines the `library.borrowing` model, tracking borrow transactions with fields for book, borrower, borrow and return dates, and return status.



```
lama@DESKTOP-PNPUFUK: ~/odoo/odoo/addons/library_management/models
  GNU nano 7.2                                                          /home/lama/odoo/odoo/addor
from odoo import models, fields, api
from datetime import timedelta

class Borrowing(models.Model):
    _name = 'library.borrowing'
    _description = 'Borrowing Record'

    book_id = fields.Many2one('library.book', string='Book', required=True)
    borrower_id = fields.Many2one('res.partner', string='Borrower', required=True)
    borrower_email = fields.Char(string='Borrower Email')
    borrow_date = fields.Date(string='Borrow Date', default=fields.Date.context_today)
    return_date = fields.Date(string='Return Date')
    returned = fields.Boolean(string='Returned', default=False)

    @api.onchange('borrow_date')
    def _onchange_borrow_date(self):
        if self.borrow_date:
            self.return_date = self.borrow_date + timedelta(days=7)

    def mark_returned(self):
        for record in self:
            record.returned = True
            record.book_id.available = True
```

6) library_book_views.xml

Defines the list and form views for managing books in the UI.

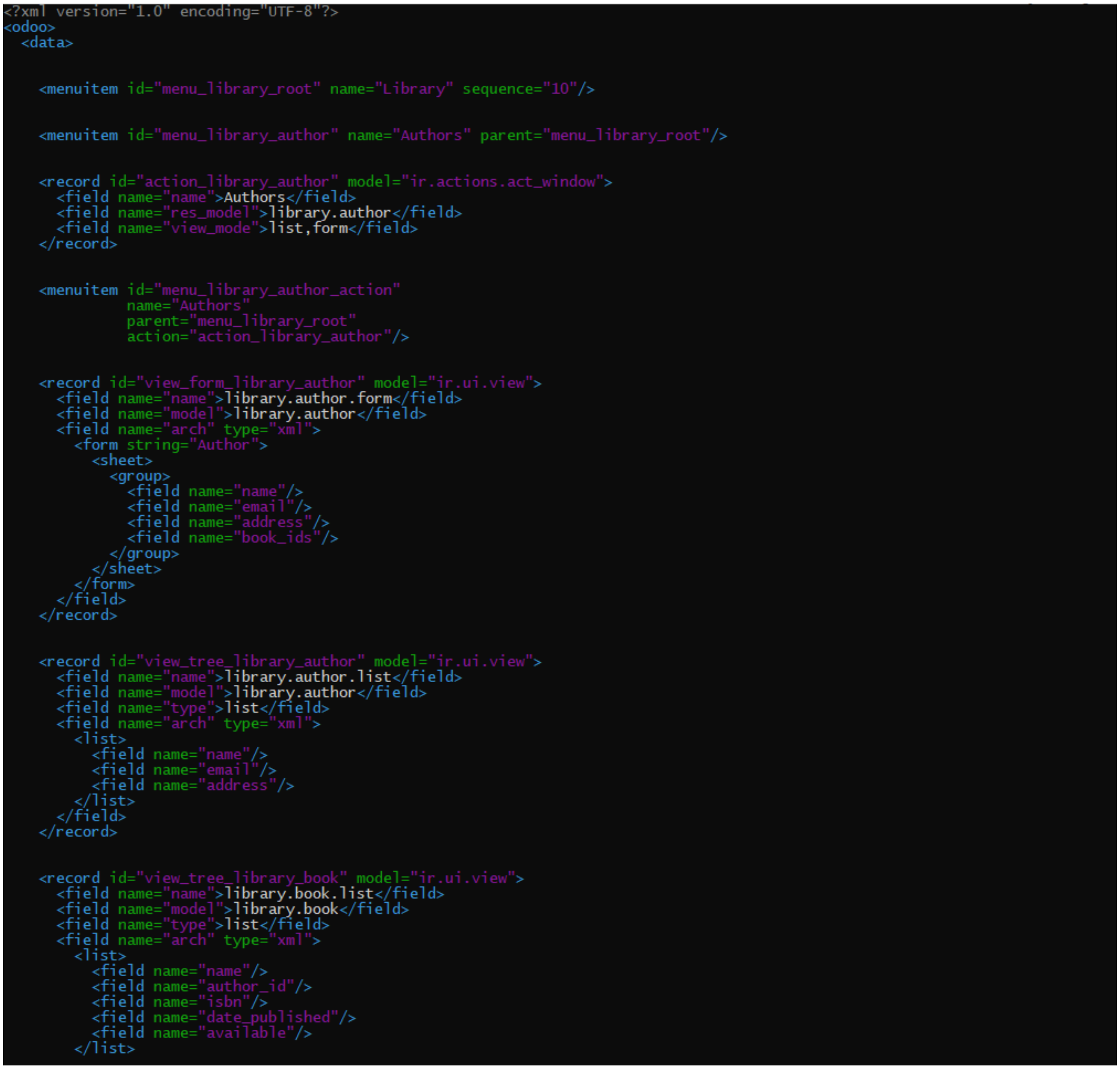


lama@DESKTOP-PNPUFUK: ~/odoo/odoo/addons/library_management/models
GNU nano 7.2

```
<?xml version="1.0" encoding="UTF-8"?>
<odoo>
  <data>

    <menuitem id="menu_library_book" name="Books" parent="menu_library_root"/>

    <record id="action_library_book" model="ir.actions.act_window">
      <field name="name">Books</field>
      <field name="res_model">library.book</field>
      <field name="view_mode">list,form</field>
    </record>

    <menuitem id="menu_library_book_action"
              name="Books"
              parent="menu_library_root"
              action="action_library_book"/>

    <record id="view_form_library_book" model="ir.ui.view">
      <field name="name">library.book.form</field>
      <field name="model">library.book</field>
      <field name="arch" type="xml">
        <form string="Book">
          <sheet>
            <group>
              <field name="name"/>
              <field name="author_id"/>
              <field name="date_published"/>
              <field name="description"/>
            </group>
          </sheet>
        </form>
      </field>
    </record>

    <record id="view_list_library_book" model="ir.ui.view">
      <field name="name">library.book.list</field>
      <field name="model">library.book</field>
      <field name="type">list</field>
      <field name="arch" type="xml">
        <list>
          <field name="name"/>
          <field name="author_id"/>
          <field name="date_published"/>
          <field name="description"/>
        </list>
      </field>
    </record>

  </data>
</odoo>
```

7) library_author_views.xml

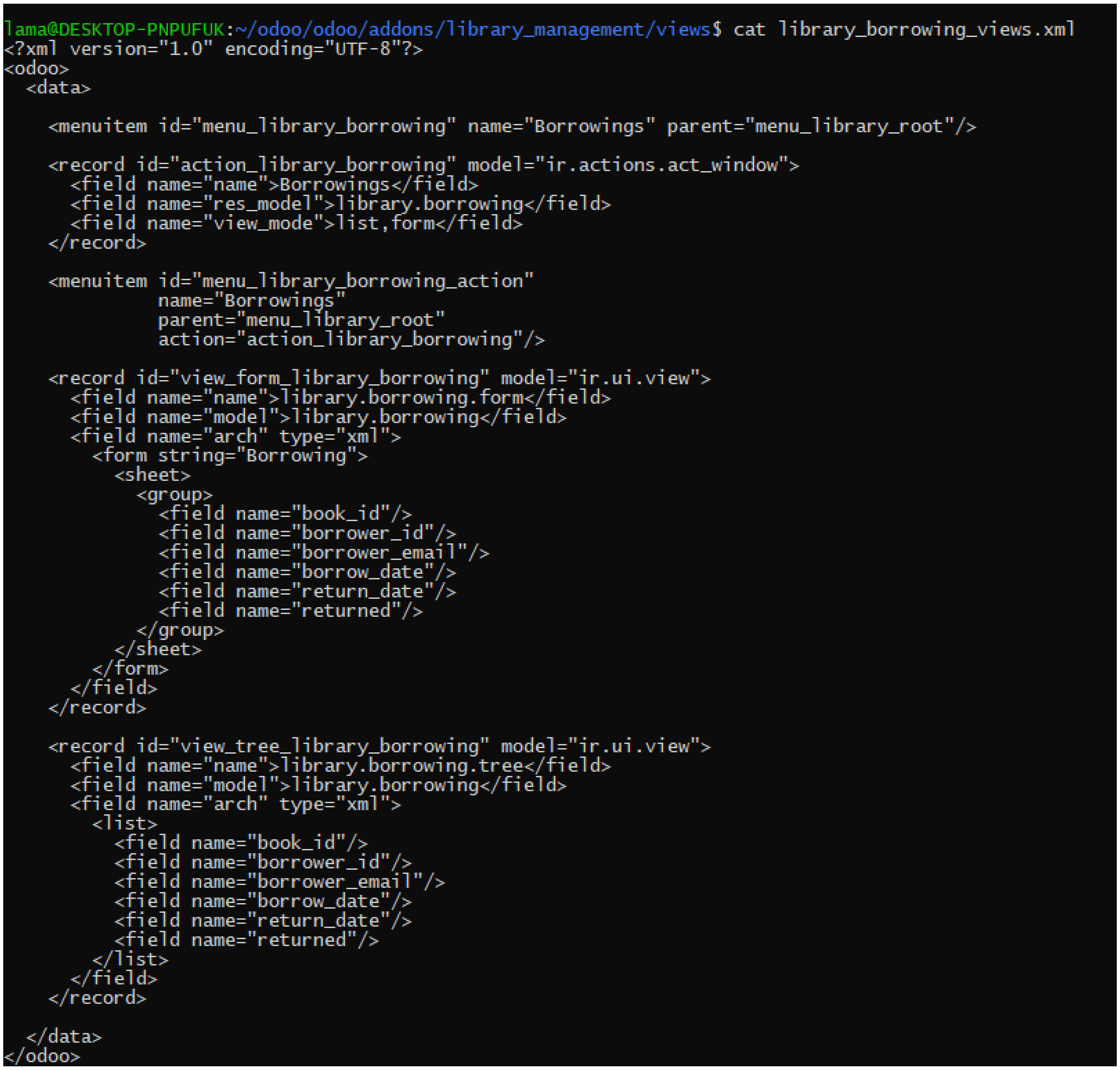
Defines the list and form views for managing authors.



```
<?xml version="1.0" encoding="UTF-8"?>
<odoo>
  <data>


    <menuitem id="menu_library_root" name="Library" sequence="10"/>


    <menuitem id="menu_library_author" name="Authors" parent="menu_library_root"/>


    <record id="action_library_author" model="ir.actions.act_window">
      <field name="name">Authors</field>
      <field name="res_model">library.author</field>
      <field name="view_mode">list,form</field>
    </record>


    <menuitem id="menu_library_author_action"
              name="Authors"
              parent="menu_library_root"
              action="action_library_author"/>


    <record id="view_form_library_author" model="ir.ui.view">
      <field name="name">library.author.form</field>
      <field name="model">library.author</field>
      <field name="arch" type="xml">
        <form string="Author">
          <sheet>
            <group>
              <field name="name"/>
              <field name="email"/>
              <field name="address"/>
              <field name="book_ids"/>
            </group>
          </sheet>
        </form>
      </field>
    </record>


    <record id="view_tree_library_author" model="ir.ui.view">
      <field name="name">library.author.list</field>
      <field name="model">library.author</field>
      <field name="type">list</field>
      <field name="arch" type="xml">
        <list>
          <field name="name"/>
          <field name="email"/>
          <field name="address"/>
        </list>
      </field>
    </record>


    <record id="view_tree_library_book" model="ir.ui.view">
      <field name="name">library.book.list</field>
      <field name="model">library.book</field>
      <field name="type">list</field>
      <field name="arch" type="xml">
        <list>
          <field name="name"/>
          <field name="author_id"/>
          <field name="isbn"/>
          <field name="date_published"/>
          <field name="available"/>
        </list>
```

8) views/library_borrowing_views.xml

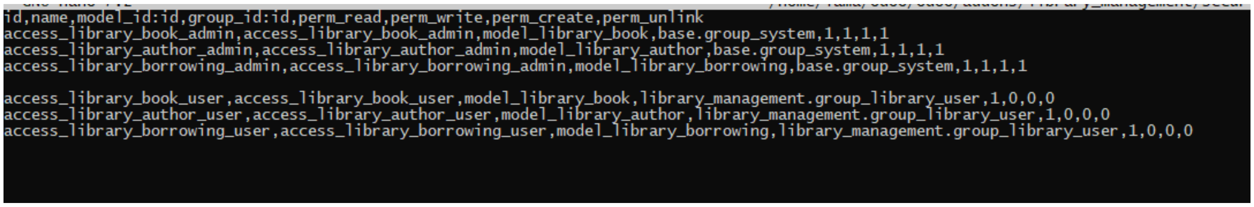
Defines the views for borrowing records, including return status and borrower details.



```
lama@DESKTOP-PNPUFUK:~/odoo/odoo/addons/library_management/views$ cat library_borrowing_views.xml
<?xml version="1.0" encoding="UTF-8"?>
<odoo>
  <data>

    <menuitem id="menu_library_borrowing" name="Borrowings" parent="menu_library_root"/>

    <record id="action_library_borrowing" model="ir.actions.act_window">
      <field name="name">Borrowings</field>
      <field name="res_model">library.borrowing</field>
      <field name="view_mode">list,form</field>
    </record>

    <menuitem id="menu_library_borrowing_action"
              name="Borrowings"
              parent="menu_library_root"
              action="action_library_borrowing"/>

    <record id="view_form_library_borrowing" model="ir.ui.view">
      <field name="name">library.borrowing.form</field>
      <field name="model">library.borrowing</field>
      <field name="arch" type="xml">
        <form string="Borrowing">
          <sheet>
            <group>
              <field name="book_id"/>
              <field name="borrower_id"/>
              <field name="borrower_email"/>
              <field name="borrow_date"/>
              <field name="return_date"/>
              <field name="returned"/>
            </group>
          </sheet>
        </form>
      </field>
    </record>

    <record id="view_tree_library_borrowing" model="ir.ui.view">
      <field name="name">library.borrowing.tree</field>
      <field name="model">library.borrowing</field>
      <field name="arch" type="xml">
        <list>
          <field name="book_id"/>
          <field name="borrower_id"/>
          <field name="borrower_email"/>
          <field name="borrow_date"/>
          <field name="return_date"/>
          <field name="returned"/>
        </list>
      </field>
    </record>

  </data>
</odoo>
```

9) security/ir.model.access.csv

Defines access rights for each model, specifying who can create, read, write, or delete records.



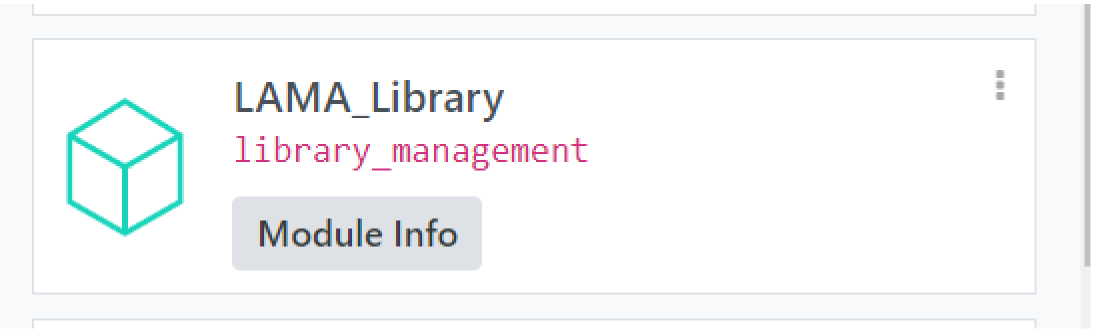
```
id,name,model_id:id,group_id:id,perm_read,perm_write,perm_create,perm_unlink
access_library_book_admin,access_library_book_admin,model_library_book,base.group_system,1,1,1,1
access_library_author_admin,access_library_author_admin,model_library_author,base.group_system,1,1,1,1
access_library_borrowing_admin,access_library_borrowing_admin,model_library_borrowing,base.group_system,1,1,1,1

access_library_book_user,access_library_book_user,model_library_book,library_management.group_library_user,1,0,0,0
access_library_author_user,access_library_author_user,model_library_author,library_management.group_library_user,1,0,0,0
access_library_borrowing_user,access_library_borrowing_user,model_library_borrowing,library_management.group_library_user,1,0,0,0
```

Implementation Phase

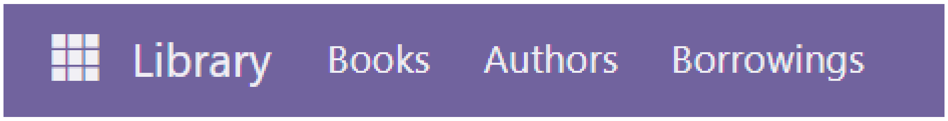
Once the foundational module structure was established, the implementation phase focused on translating the module's design into functional business logic and user-friendly interfaces within the Odoo 18.0 environment. This phase involved coding model logic, designing UI views, applying business rules, and testing interactions between components.

1-Model Logic Implementation

Two interfaces were created: one for the admin and one for the user. As observed.

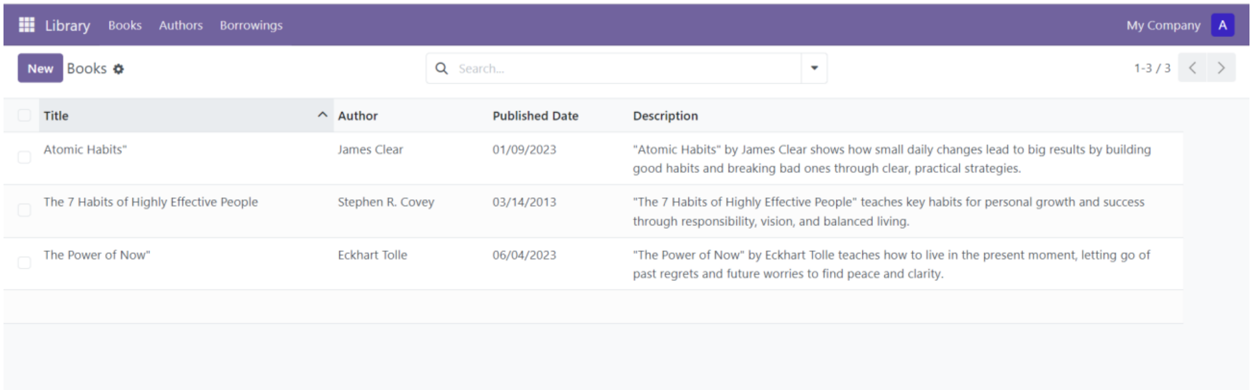


Here, we have three lists: Books, Authors, and Borrowing.



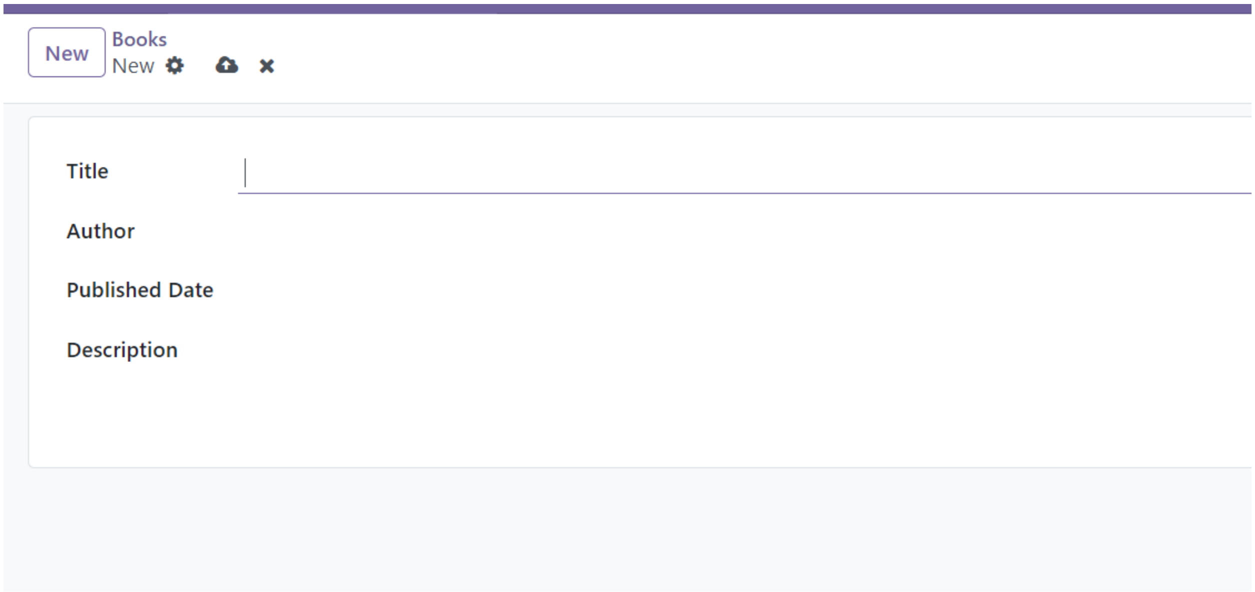
And here appears the admin interface. As shown, the admin can read, edit, add, and delete :

The Books list: contains a form that includes the title of the book, the author’s name, the published date, and a brief description of the book.

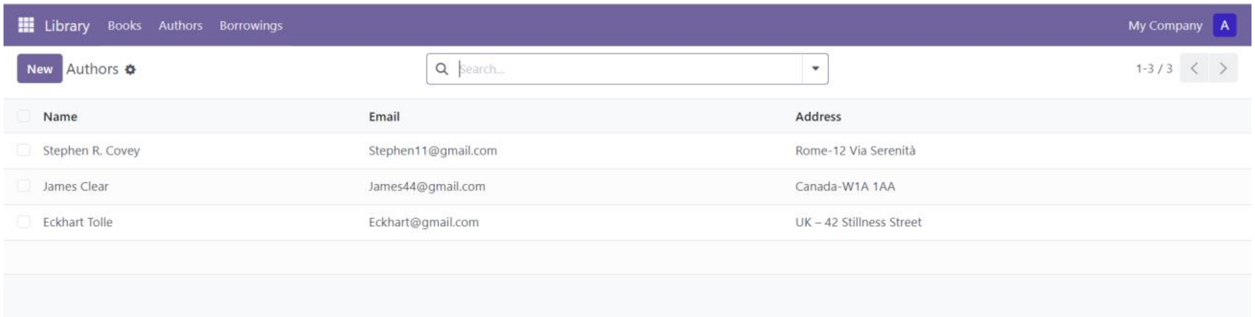


Title	Author	Published Date	Description
Atomic Habits"	James Clear	01/09/2023	"Atomic Habits" by James Clear shows how small daily changes lead to big results by building good habits and breaking bad ones through clear, practical strategies.
The 7 Habits of Highly Effective People	Stephen R. Covey	03/14/2013	"The 7 Habits of Highly Effective People" teaches key habits for personal growth and success through responsibility, vision, and balanced living.
The Power of Now"	Eckhart Tolle	06/04/2023	"The Power of Now" by Eckhart Tolle teaches how to live in the present moment, letting go of past regrets and future worries to find peace and clarity.

By clicking the “New” button, the admin can add the book information.

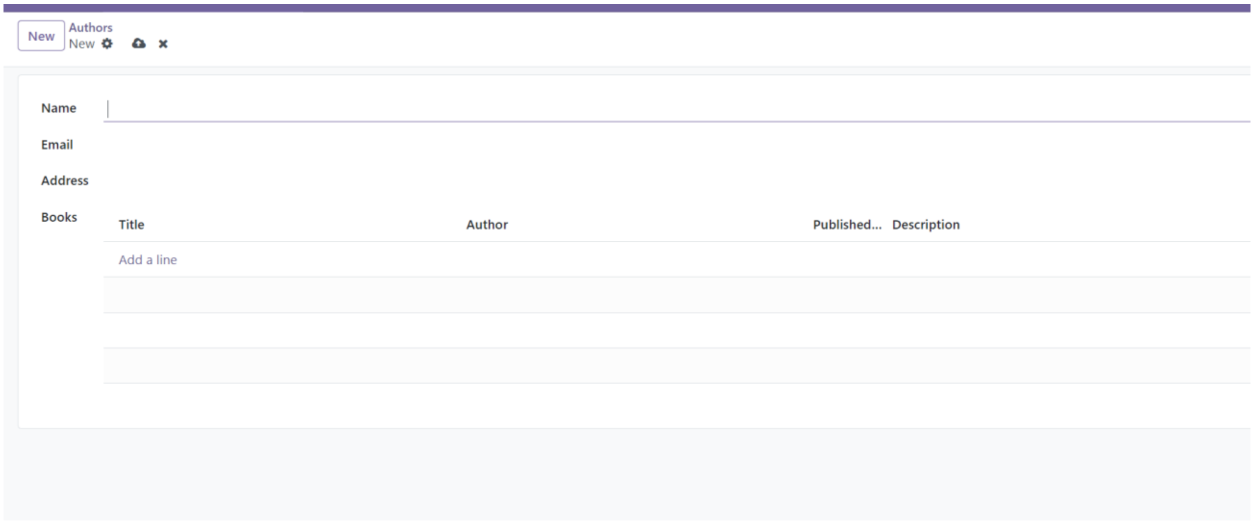


The Authors list contains the author's name, email, and address.



Name	Email	Address
Stephen R. Covey	Stephen11@gmail.com	Rome-12 Via Serenità
James Clear	James44@gmail.com	Canada-W1A 1AA
Eckhart Tolle	Eckhart@gmail.com	UK – 42 Stillness Street

By clicking the ”New” button, the admin can enter the author's information.



Name

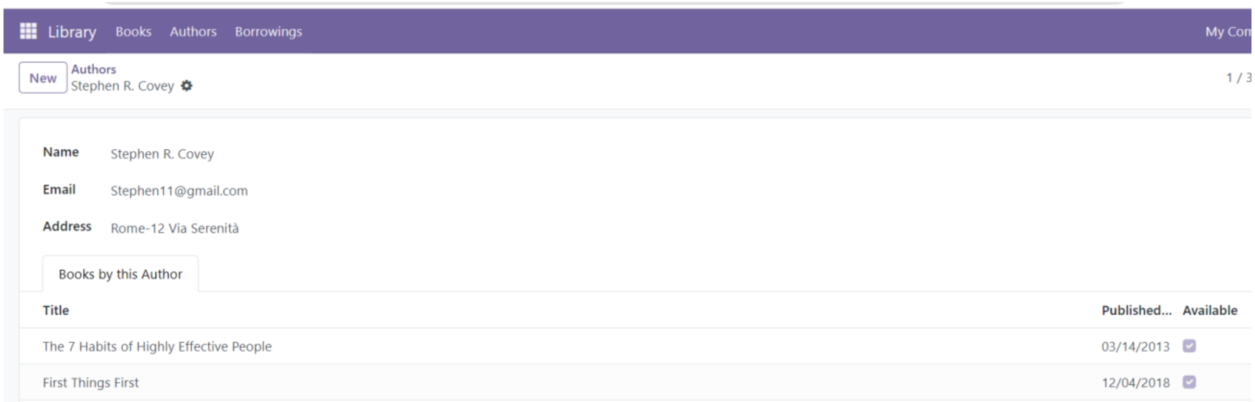
Email

Address

Books

Title	Author	Published...	Description
Add a line			

There is also a list that shows the books written by the author



Name Stephen R. Covey

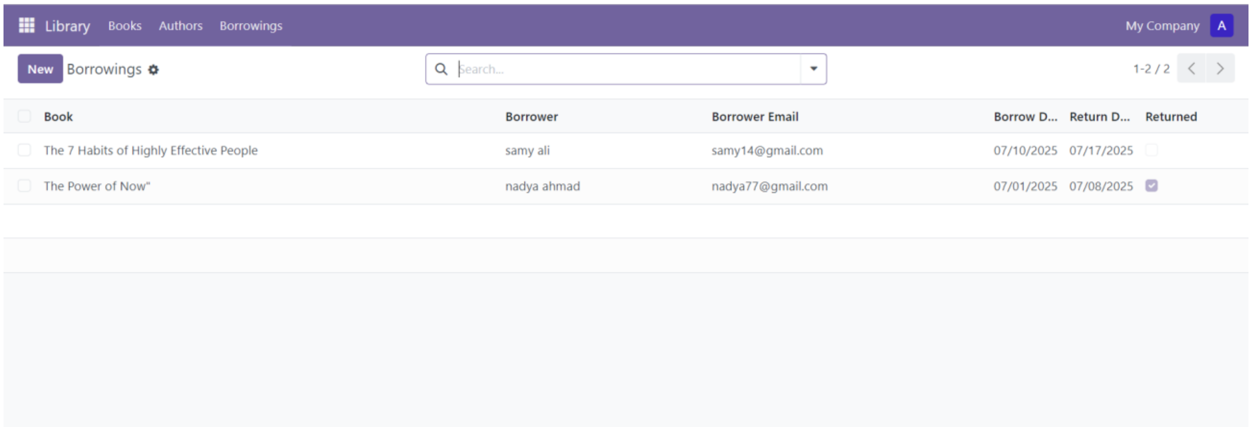
Email Stephen11@gmail.com

Address Rome-12 Via Serenità

Books by this Author

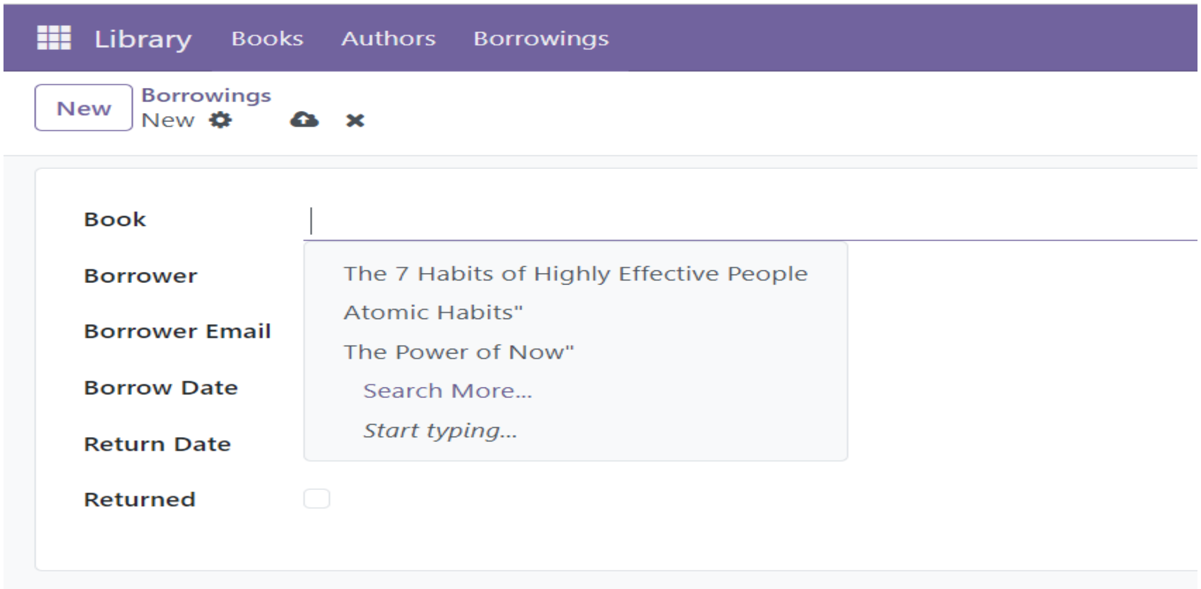
Title	Published...	Available
The 7 Habits of Highly Effective People	03/14/2013	☑
First Things First	12/04/2018	☑

By clicking on the Borrowing list, it is contains book name, borrower name, borrower email, borrow date, return date, and whether the book was returned.
Note that the system automatically sets the borrowing period to 7 days only.



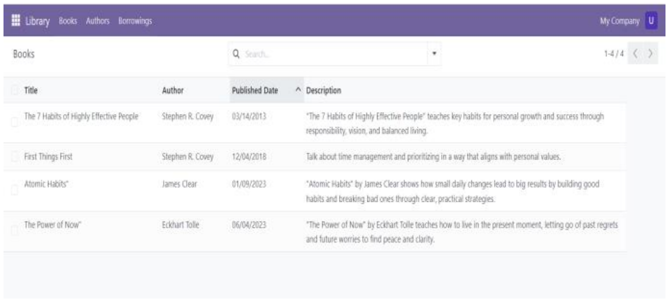
Book	Borrower	Borrower Email	Borrow D...	Return D...	Returned
The 7 Habits of Highly Effective People	samy ali	samy14@gmail.com	07/10/2025	07/17/2025	□
The Power of Now"	nadya ahmad	nadya77@gmail.com	07/01/2025	07/08/2025	☑

By clicking the “New” button, we can enter the Borrowing information.



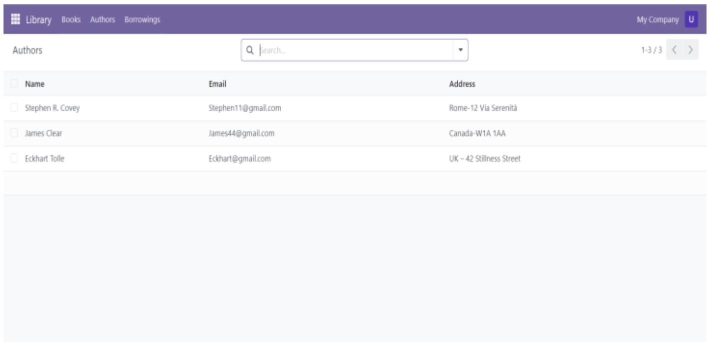
Book
Borrower
Borrower Email
Borrow Date
Return Date
Returned □

the user interface is configured with read-only permissions, without any modification capabilities



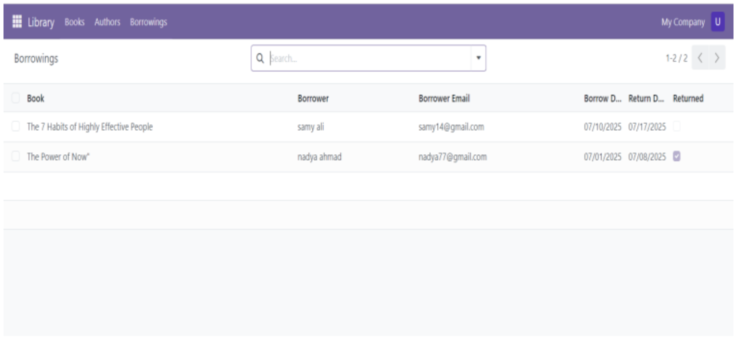
Books

Title	Author	Published Date	Description
The 7 Habits of Highly Effective People	Stephen R. Covey	03/14/2013	"The 7 Habits of Highly Effective People" teaches key habits for personal growth and success through responsibility, vision, and balanced living.
First Things First	Stephen R. Covey	12/04/2018	Talk about time management and prioritizing in a way that aligns with personal values.
Atomic Habits"	James Clear	01/09/2023	"Atomic Habits" by James Clear shows how small daily changes lead to big results by building good habits and breaking bad ones through clear, practical strategies.
The Power of Now"	Eckhart Tolle	06/04/2023	"The Power of Now" by Eckhart Tolle teaches how to live in the present moment, letting go of past regrets and future worries to find peace and clarity.



Authors

Name	Email	Address
Stephen R. Covey	Stephen11@gmail.com	Rome-12 Via Serenità
James Clear	James44@gmail.com	Canada-W1A 1AA
Eckhart Tolle	Eckhart@gmail.com	UK – 42 Stillness Street



Borrowings

Book	Borrower	Borrower Email	Borrow D...	Return D...	Returned
The 7 Habits of Highly Effective People	samy ali	samy14@gmail.com	07/10/2025	07/17/2025	□
The Power of Now"	nadya ahmad	nadya77@gmail.com	07/01/2025	07/08/2025	☑

Challenges

1. **Installation Difficulties:**
The environment setup process was complex and exhausting, especially during the downloading and installation of Odoo and its dependencies.

2. **Frequent Errors in Views and Models:**
Many errors occurred while writing and loading view files (`.xml`) and model files (`.py`). Debugging these issues took significant time and effort.

Conclusion

This task provided hands-on experience in setting up an Odoo development environment and creating a fully functional custom module. The Library Management Module successfully demonstrates:

- Proper model design and relationships.
- Clean and responsive user interface.
- Business logic automation (auto return date).
- Navigation through top-level menus and record filtering.