

Week 9: Pointer, Reference, Virtual Function

Learning Materials: Chapter 10

You are tasked with developing a system for a library to manage different types of resources they provide, such as books, eBooks, and audiobooks. The base code for this project is partially implemented in the `library_resources.cpp` file. Complete the following tasks:

TASK 1:

Define classes **Book**, **EBook**, and **Audiobook** that inherit the **LibraryResource** class.

Book should have an attribute `coverType` {Hardcover, Paperback}.

EBook should have an attribute `fileSize` (in MB).

Audiobook should have an attribute `duration` (in minutes).

Implement an appropriate parameterized constructor for each class to initialize these attributes.

TASK 2:

Implement a `resourceDetails()` function, which displays information about the resource. Below is an example output for a Book object:

Title:	The Alchemist
Author:	Paulo Coelho
Price:	500
Cover Type:	Hardcover

TASK 3:

The librarian wants to add an attribute called `no_of_copies` for all **LibraryResource** objects. The default value will be 1. Add necessary getter and setter functions. Update the `resourceDetails()` display the `no_of_copies`.

TASK 4:

Implement `sort_resources_price(LibraryResource**, n);` to sort an array of pointers to library resources in ascending order of their prices. Add any required member functions to the appropriate class.

```
int main() {
    LibraryResource* resource_list[100];

    /** TASK 1:
        So that the following lines execute without errors
    */
    resource_list[0] = new Book("The Alchemist", "Paulo Coelho",
500,
        CoverType::Hardcover);
    resource_list[1] = new EBook("1984", "George Orwell", 300,
2.5);
    resource_list[2] = new Audiobook("Becoming", "Michelle Obama",
700, 120);

    /** TASK 2: Display details */
    for (int i = 0; i < 3; i++) {
        resource_list[i]->resourceDetails();
    }

    /** TASK 3: Setting ISBN for Book */
    resource_list[0]->set_no_of_copies(50);
    resource_list[1]->set_no_of_copies(5);
    resource_list[2]->set_no_of_copies(1);

    for (int i = 0; i < 3; i++) {
        resource_list[i]->resourceDetails();
    }

    /** TASK 4: Sorting resources by price
        Created 7 more objects.*/

    resource_list[3] = new Book("Sapiens", "Yuval Noah Harari",
1000, CoverType::Paperback);
    resource_list[4] = new EBook("Digital Minimalism", "Cal
Newport", 400, 3.2);
    resource_list[5] = new Audiobook("Atomic Habits", "James
Clear", 1200, 180);
    resource_list[6] = new Book("Dune", "Frank Herbert", 800,
CoverType::Hardcover);
    resource_list[7] = new EBook("The Subtle Art of Not Giving a
F*ck", "Mark Manson", 350, 1.8);
    resource_list[8] = new Audiobook("Educated", "Tara Westover",
600, 150);
    resource_list[9] = new Book("Harry Potter and the Philosopher's
```

```
Stone", "J.K. Rowling", 450, CoverType::Paperback);

    sort_resources_price(resource_list, 10);

    /** Display sorted resources */
    for (int i = 0; i < 10; i++) {
        resource_list[i]->resourceDetails();
    }

    return 0;
}
```