**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 |
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### **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;  } |
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