

Lab 5: CRC

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Exercises:

1. As a group, use CRC as the method to play a CRC session to design the application supporting the operation of a technical library. Email the answers (CRC cards). Please make sure you review the CRC model before you submit the answer.

Answer:

Class: Library	
Responsibilities	Collaborators
check out lendable (books, videos, technical journals)	Borrower, Lendable
return Lendables (books, videos, technical journals)	Borrower, Lendable, Library
search for lendable (books, videos, technical journals)	Lendable
lend more material to employees with no overdue lendable, fewer than five articles out, and total fines less than \$100	Borrower, Lendable

Class: Borrower	
Responsibilities	Collaborators
Search for lendable (books, videos, technical journals)	Borrower, Lendable
keeps track of its name	
keeps track of its lendable ID	
keeps track of its company ID	
keeps track of number of borrowed lendables	
keeps track of overdue fines	Borrower, Date

Class: Lendable	
Responsibilities	Collaborators
keeps track of whether on loan or not	
keeps track of its due date	Date
keeps track of its title	
keeps track of its lendable ID	
keeps track if late	Date
keeps track of its check out date	Date
keeps track of its lendable type	Lendable

Class: Date	
Responsibilities	Collaborators
keeps track of current date	
can compute advance dates	
can compare two dates	

Class: Book	
Superclass: Lendable	
Responsibilities	Collaborators
keeps track of its per day fine	
keeps track of its allowed lending period	Date
keeps track of its author(s)	
keeps track of number of pages	

Class: Video	
Superclass: Lendable	
Responsibilities	Collaborators
keeps track of its per day fine	
keeps track of its allowed lending period	Date
keeps track of its creator(s)	
keeps track of the length of video	

Class: Technical Journal	
Superclass: Lendable	
Responsibilities	Collaborators
keeps track of its per-day fine	
keeps track of its allowed lending period	Date
keeps track of its writer(s)	
keeps track of its publication(s)	

Class: Library Database	
Responsibilities	Collaborators
stores transactions details	Borrower
get lendable details	Lendable
get borrower details	Borrower
knows library information	

Class: Payments Manager	
Responsibilities	Collaborators
get lendable cost	Lendable
check due	Lendable
select payment	Borrower, Payments Manager
get card details	Borrower

2. As a group, generate FIVE use cases to use the CRC cards in part 1. Add / delete / update any CRC card as needed. Email the interaction / workflow among the CRC cards in each use case. Example of a use case: Check out a video from the technical library with an employee that has an overdue lendable.

Answer:

1) Use Case 1 : **User fine**

The borrower class returns the lendable (book, video etc), with its lendable ID and date to the Library class, then the library class uses the date class to compute fine. The borrower class pays the fine to the Payments manager class.

2) Use Case 2 : **Can lend more material**

The borrower class returns the lendable (book, video etc), with its lendable ID and date to the Library class. Then, the library class decides whether it can lend more material to

the borrower based on a prerequisite condition (no overdue lendable, fewer than five articles out, and total fines less than \$100).

3) Use Case 3 : **Search material**

The borrower class places a request to the Library class giving the name of the lendable class and company ID. The Library class performs the search on the Library database class and returns the lendable to the borrower if it is available. If lendable is not available, then Library class uses the Lendable class to check the lendable date for that particular lendable ID, and returns the date when it will be available to the borrower.

4) Use Case 4 : **Checkout materials**

The borrower places a request to the library to check out a lendable. The library class uses the lendable class to get the lendable ID of that lendable by checking the Library database class. If the lendable is available, then the borrower is allowed to checkout.

5) Use Case 5 : **Check duration**

The borrower returns the lendable to the library. Then the Lendable class uses the date class and the library database class to compute the number of days that the lendable has been borrowed by the borrower.