Construct a class diagram using UML for the design of the following application. It is not necessary to specify operations of the classes. It is also not necessary to specify the data types and visibility of the attributes. Make reasonable assumptions and state them.

**Small ‘Toy’ Library**

An extremely small library wants to keep track of its collection. Information about all books should be stored with unique US library of congress call numbers. The author names, publishers, dates of publications and categories should be stored. A book must be classified under at least one category, but it may be under many categories. A patron may borrow books. There may be more than one copies of the same book. For example, there may be five copies of the book "Gone with the wind" and thus five patrons can check the book out at the same time. Names, SS# (unique), addresses, phone numbers and email addresses of patrons should be stored.

A patron may check out books, which have a check-out period of two weeks. There is a penalty of 50 cents per day per book. The penalty account is updated at the end of every month and when books are returned. A patron may specify favorite categories, such as 'horror', 'computer', 'romance', etc. When new books in a category arrive, the patron may be informed through email.

It should be possible for the library to find out the circulation of a given book.

A librarian may also change the penalty balance of a patron. However, when this is done, the staff ID of the librarian should be noted.

If a book is lost, it should be recorded. A loss may be reported by a patron. Alternatively, a book is simply lost with no one responsible for it. If a book is lost by a patron, a replacement charge will be charged to the patron. The librarian who records the lost should be stored.