```java
//2018.Final

import java.util.ArrayList;

public class Library {
  private HashMap<Integer, Book> books;
  private HashMap<Integer, User> users;
  private List<Rental> rentals;

  public static final int FEE_PER_DAY = 2;
  public static final int RENTAL_DURATION = 7;

  public Library() {
    books = new HashMap<Integer, Book>();
    users = new HashMap<Integer, User>();
    rentals = new ArrayList<Rental>();
  }

  public void addBook(Book b) {
    books.put(b.getISBN(), b);
  }

  public void addUser(User u) {
    users.put(u.getID(), u);
  }

  public User getUser(int uid) {
    return users.get(uid);
  }

  public Book getBook(int bid) {
    return books.get(bid);
  }

  public void borrowBook(int u, int b, int d) {
    User user = getUser(u);
    Book book = getBook(b);
    rentals.add(new Rental(user, book, d + 7));
    System.out.println(user.getName() + " borrowed " + book.getTitle() + " and must return it by " + (d + 7));
  }

  public void returnBook(int u, int b, int d) {
    User user = getUser(u);
    Book book = getBook(b);
    int fee = 0;
    int daysLate = 0;
    Rental remove = null;
    for (Rental r : rentals) {
      if (book.getISBN() == r.getBook().getISBN() && user.getID() == r.getUser().getID()) {
        daysLate = d - r.getDueDate();
        fee = Math.max(0, daysLate);
        remove = r;
      }

    }
    rentals.remove(remove);
    user.addFee(fee);
    if (daysLate > 0) {
      System.out.println(user.getName() + " returned " + book.getTitle() + " " + daysLate
          + " days late and was charged a fee of " + fee);
    } else {
```

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64        System.out.println(user.getName() + " returned " + book.getTitle() + " on time and was
  not charged a fee");
65      }
66    }
67
68    public void processTransaction(String type, int user, int date, int bookAmt) {
69      if ("Rental".equals(type)) {
70        borrowBook(user, bookAmt, date);
71      } else if ("Return".equals(type)) {
72        returnBook(user, bookAmt, date);
73      } else if ("Payment".equals(type)) {
74        User u = getUser(user);
75        u.payFee(bookAmt);
76        System.out.println(u.getName() + " paid fee of " + bookAmt + " and has a remaining
  balance of " + u.getBalance());
77      }
78    }
79  }
80
```