Scenario:

Middlesex Movies (MMovie) is a new company formed to capitalize on a growing trend in movie theatres: **reserved seats**. In Europe and Japan, it has long been the accepted practice that some or all of a movie theatre may be reserved seats, which can be booked ahead of time for specific performances. This practice is now being adopted by some U.S. theatre companies to improve the movie-going experience, which is, of course, in competition for its life against home video (DVDs) and cable/satellite channels.

MMovie books reservations centrally for certain showing of films at a number of theatres in the Route-128 and I-495 area circling Boston. MMovie buys reserved rows in bulk for resale. Given their up-scale clientele, the company handles reservations for seats and cancellations. The service has proved very popular. So popular, in fact, that MMovie's original notebook-based reservation procedure can't keep up with the volume of changes by clients. MMovie needs an improved application to better track current seat reservations.

The files whose contents are listed below represent one day of MMovie's business: films available that day; existing reservations for that day; changes affecting that day's reservations. Don't worry about date as a data item. "Book" means to make a reservation; "Cancel" means to delete the reservation.

These files are for a "Master File Update" process. MMovie's application reads in the current list of films and reservations (together, the "Master File"), placing them into a data structure in memory. Then, the program reads the changes received and applies them to the data in memory. After the last change is processed, the program writes out the new Master File (updated reservations).

Task:

Examine the data carefully.
Identify the problems and pitfalls contained in the data instances.
Make a list of all separate cases (kinds) of problems you find.

Data Files for MMovies

Note: Periods (.) in this listing show where there are spaces. The following number ruler is to help you identify column positions. They are not data in the files.

```
                    1         2         3         4         5         6         7
          123456789012345678901234567890123456789012345678901234567890123456789012
```

Film Showings File (contains in order: showing number, film, date, time, theatre)
```
102..Titanic............101302..1930..Woburn..........
301..Good.Will.Hunting..101302..2015..Woburn..........
428..Titanic............101302..2000..Burlington......
504..Primary.Colors.....101302..2000..Dedham..........
601..Good.Will.Hunting..101302..2100..Burlington......
624..King.of.Hearts.....101302..2200..Burlington......
799..Rocky.Horror.......101302..2359..Woburn..........
```

Reservations File (contains in order: customer-id, customer name, showing number)
```
123456..Newman............Alfred.E.....428..
550077..Fincio............Al...........301..
203040..Allen.............Ralph........624..
321546..Kang..............Kyo..........624..
201546..Planner..........Gary........996..
002143..Mason............Suzanne......504..
011256..Tyre.............Hiram........428..
169943..Newman...........Alfred.E.....624..
021376..Clinton..........Hillary......799..
203040..Allen.............Grace........799..
321546..Kang..............Kyo..........428..
```

Reservation Changes File (contains in order: change, showing number, id, name)
```
BOOK....102..127894..Clemens...........Roger....
CANCEL..428..127894..Newman............Alfred...
CANCEL..624..168365..Bullard...........Perry....
BOOK....428..011256..Tyre..............Hiram....
BOOK....601..550077..Fincio............Al.......
BOOK....428..114566..Liddle...........Alice....
BOOK....624..168365..Bullard..........Perry....
CANCEL..428..123456..Newman............Al.......
BOOK....428..114566..Liddle...........Alice....
BOOK....428..002143..Mason.............Susan....
CANCEL..504..021234..Rodham...........Hillary..
BOOK....241..001100..Ito...............Lance....
BOOK....428..114566..Liddle...........Alice....
BOOK....428..026376..Peterson.........Naomi....
CANCEL..428..114566..Liddle...........Alice....
BOOK....799..021234..Clinton..........Hillary..
BOOK....428..114566..Liddle...........Alice....
CANCEL..504..002143..Mason.............Susan....
BOOK....888..321546..Kyo..............Kang.....
CANCEL..102..021234..Clinton..........Hillary..
CANCEL..624..127894..Clemens..........Roger....
BOOK....601..201546..Planer...........Gary.....
BOOK....504..127894..Clemens..........Roger....
CANCEL..799..021234..Clinton..........Hillary..
BOOK....012..949764..King.............Larry....
BOOK....624..114566..Liddle...........Alice....
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