LoansCARD - NO = Loans CARD - NO
BORROWERS CARD - NO = Loans CARD - NO

We apply rule (g) to replace the last of these expressions by

BORROWERS CARD - NO = Loans CARD - NO

Next, we can combine the two projections into one, by applying rule (g),

BORROWERS CARD - NO = Loans CARD - NO

The resulting tree is shown in Fig. 8.7. Then by the extended rule (g),
we can replace rule (g) and rule (f) by the extended rule (g) above. The extended rule (g) can be moved down to apply to the product

BORROWERS CARD - NO = Loans CARD - NO

as it is an attribute of Loans, and the result of a selection takes the form

BORROWERS CARD - NO = Loans CARD - NO

by applying rule (g) to the selection on LoansCARD

BORROWERS CARD - NO = Loans CARD - NO

However, the selection on LoansCARD is an attribute of LoansCARD, and hence cannot be moved down. So, as far as possible, we apply

BORROWERS CARD - NO = Loans CARD - NO

BORROWERS CARD - NO = Loans CARD - NO

We next move this selection as far down as possible, The selection on LoansCARD is an attribute only of LoansCARD, and hence cannot be moved down.

Then we move each of the three selections as far down as possible.

BORROWERS CARD - NO = Loans CARD - NO

in Fig. 8.7.

After substituting for XLOANS, the expression above has the parse tree shown.

3/82 XLOANS (XLOANS)

date 1/1/82
XLOANS (XLOANS)
ADDRTITLE, CITY, CARD, NO, DATE
S = TITLE, AUTHOR, PUBLISH, LC, NO, NAME.

where

BORROWERS CARD - NO = Loans CARD - NO

BORROWERS CARD - NO = Loans CARD - NO

Note that LoansCARD - NO in the name of an attribute of LoansCARD

can be moved down to apply to the product

BORROWERS CARD - NO = Loans CARD - NO

as it is an attribute of LoansCARD, and hence cannot be moved down. So, as far as possible, we apply

BORROWERS CARD - NO = Loans CARD - NO

and the result of a selection takes the form

BORROWERS CARD - NO = Loans CARD - NO

by applying rule (g) to the selection on LoansCARD

BORROWERS CARD - NO = Loans CARD - NO

However, the selection on LoansCARD is an attribute of LoansCARD, and hence cannot be moved down. So, as far as possible, we apply

BORROWERS CARD - NO = Loans CARD - NO

for the selection DATE

BORROWERS CARD - NO = Loans CARD - NO

ADDRTITLE, CITY, CARD, NO, DATE
S = TITLE, AUTHOR, PUBLISH, LC, NO, NAME.

where

BORROWERS CARD - NO = Loans CARD - NO

BORROWERS CARD - NO = Loans CARD - NO

Note that LoansCARD - NO in the name of an attribute of LoansCARD

can be moved down to apply to the product

BORROWERS CARD - NO = Loans CARD - NO

as it is an attribute of LoansCARD, and hence cannot be moved down. So, as far as possible, we apply

BORROWERS CARD - NO = Loans CARD - NO

and the result of a selection takes the form

BORROWERS CARD - NO = Loans CARD - NO

by applying rule (g) to the selection on LoansCARD

BORROWERS CARD - NO = Loans CARD - NO

However, the selection on LoansCARD is an attribute of LoansCARD, and hence cannot be moved down. So, as far as possible, we apply

BORROWERS CARD - NO = Loans CARD - NO

for the selection DATE

BORROWERS CARD - NO = Loans CARD - NO

ADDRTITLE, CITY, CARD, NO, DATE
S = TITLE, AUTHOR, PUBLISH, LC, NO, NAME.
The problem we consider is one in which we are given a query of the form:

$\text{SELECT \ast FROM \text{TABLE}_1, \text{TABLE}_2 \text{ WHERE } \text{CONDITION}$

We shall focus in this section on a problem that is intrinsic to several

TABLE 8 Optimization of Selections in Systems

![Diagram showing optimization process]

8.3. The minimal cost of an operator is the cost of its output in addition to the cost of all operators preceding it. This is a consequence of the fact that the cost of an operator is the cost of its output in addition to the cost of all operators preceding it.

In general, we can use the following rules to optimize the selection:

1. **Rule 8.3.** The minimal cost of an operator is the cost of its output in addition to the cost of all operators preceding it.
2. **Rule 8.4.** The order of operators in an expression is not significant.
3. **Rule 8.5.** The cost of an operator is the cost of its output in addition to the cost of all operators preceding it.

By applying these rules, we can optimize the selection process efficiently.