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Heuristic Query Optimization

Consider the following relational database schema (primary keys are underlined) and 2 SQL queries:

Hotel (hotelNo, hotelName, city)

Room (roomNo, hotelNo, type, price)

Booking (hotelNo, guestNo, dateFrom, dateTo, roomNo)

Guest (guestNo, guestName, guestAddress)

```
SELECT r.roomNo, r.type, r.price
FROM Room r, Booking b, Hotel h
WHERE r.roomNo = b.roomNo AND b.hotelNo = h.hotelNo AND h.hotelName = "Ritz" AND r.price > 100;
```

```
SELECT g.guestNo, g.guestName
FROM Room r, Booking b, Hotel h, Guest g
WHERE h.hotelNo = b.hotelNo AND g.guestNo = b.guestNo AND h.hotelNo = r.hotelNo AND
      h.hotelName = "Ritz" AND dateFrom >= "Jan 01, 2001" AND dateTo <= "Dec 31, 2001";
```

For **each of these** two SQL queries:

- (A) state what information they retrieve
- (B) give a corresponding Relational Algebra expression
- (C) draw the initial canonical query tree
- (D) use heuristic optimization to transform it into the most efficient query tree possible.

show all intermediate steps and transformations in detail

All assignment submissions must be typesetted.

Late assignment submissions will not be accepted and will be marked with **0**.

See the course outline for the general submission and the naming convention requirements.

Marking Scheme: (A): 10 marks, (B): 10 marks, (C): 10 marks, (D): 70 marks