

Given the following relations, express each query below using relational algebra”

Hotel (hotelNo, hotelName, city)

Room (roomNo, hotelNo, type, price)

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

Guest (guestNo, guestName, guestAddress)

- a) The names of all cities where the hotels are.

$$\prod_{city} (Hotel)$$

- b) Room numbers of all rooms at the hotel with hotel number 1101 which are more expensive than \$100.

$$\prod_{roomNo} (\sigma_{price > 100 \wedge hotelNo = 1101} (Room))$$

- c) Names of all hotels who have some rooms more expensive than \$200.

$$\prod_{hotelName} (Hotel \mid \times \mid \sigma_{price > 200} (Room))$$

natural join

price > 200 and hotel.hotel_no = room.hotel_no
if you use cartesian product

- d) Names of guests who entered the hotel number 1400 on 25/10/2002

$$temp \leftarrow \sigma_{dateFrom = "25Oct 2002" \wedge hotelNo = 1400} (Booking)$$

$$\prod_{guestName} (temp \mid \times \mid Guest)$$

- e) Increase the price of all rooms more expensive than \$100 by \$20 and the price of all other rooms by \$10.

$$Room \leftarrow \prod_{roomNo, hotelNo, type, price+20} (\sigma_{price > 100}(Room)) \cup \prod_{roomNo, hotelNo, type, price+10} (\sigma_{price \leq 100}(Room))$$

- f) “Golf Resort Hotel” with hotel no 2140 will not operate during the year 2005. Remove this hotel and its reservations from the database.

correction: hotelNo=2140

$$Hotel \leftarrow Hotel - \sigma_{roomNo=2140}(Hotel)$$

$$Room \leftarrow Room - \sigma_{roomNo=2140}(Room)$$

$$Booking \leftarrow Booking - \sigma_{roomNo=2140}(Booking)$$

- g) Find the average room price for every hotel New York.

separately

$$hotelNo \ G_{avg(price)}(Room \mid \times \mid (\sigma_{city="NewYork"}(Hotel)))$$