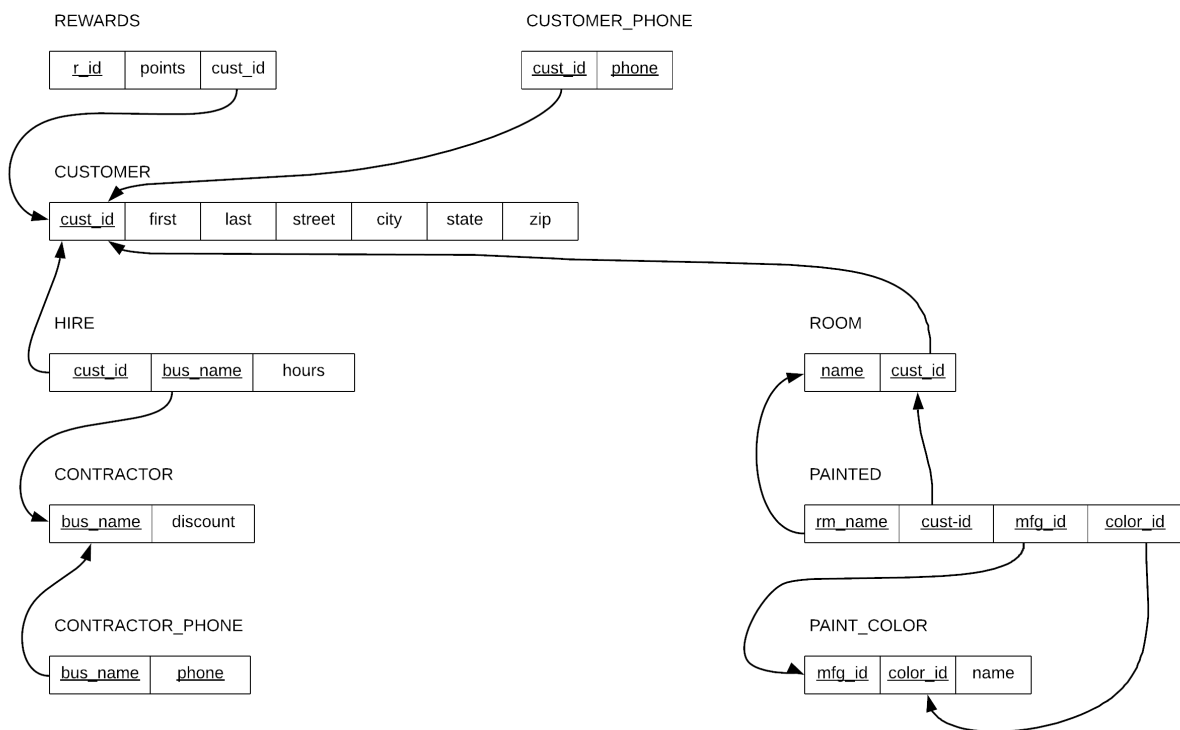


CSC134 - Spring 2019 - Applebaum

Assignment 3

Total: 100 points

Specify relational algebra equations that would perform the given queries on the following schema. You may use intermediate relations to make your work clearer. Proper notation should be used. (You can insert special characters with Character Viewer on Mac or Character Map on Windows). The homework must be typed and submitted as a PDF to Canvas.



- 1) Find the business name of all contractors who have worked at least 10 hours for a customer in the 95819 zip code.

```
CUST_95819 ← σzip = '95819' (CUSTOMER)
TEN_HOURS ← σhours ≥ 10 (HIRE)
RESULT ← πbus_name (CUST_95819 * TEN_HOURS)
```

- 2) Find the first and last names of all customers who have between 100 and 1000 rewards points.

```
REWARDS_RANGE ← σpoints > 100 and points < 1000 (REWARDS)
RESULT ← πfirst, last (CUSTOMER * REWARDS_RANGE)
```

- 3) Find the names of all paint colors that have not been used in a room.

```
USED_COLORS ← PAINTED * PAINT_COLOR
UNION_COMPAT_USED ← πmfg_id, color_id, name (USED_COLORS)
RESULT ← πname (PAINT_COLOR - USED)
```

Note here that if we used cross product or equijoin, we would need to select / join on both mfg_id and color_id. Natural join takes care of that for us. Also note that this is another problem where trying to select on something not equal is not going to work – you need set difference.

- 4) Find the business name, discount, and phone number of all contractors who have worked at least 1 hour for customers with the last name of 'Valdez'.

```
VALDEZ ← σlast = 'Valdez' (CUSTOMER)
ONE_HOUR_VALDEZ ← VALDEZ * (σhour ≥ 1 (HIRE))
VALDEZ_CONT ← CONTRACTOR * ONE_HOUR_VALDEZ
RESULT ← πbus_name, discount, phone (VALDEZ_CONT * CONTRACTOR_PHONE)
```

- 5) Find the first and last names of all customers who have used a paint color named “Blushing Pink” in a room named “Bedroom 1”

$$\text{PINK_BEDROOM} \leftarrow \sigma_{\text{name} = \text{'Blushing Pink'} \text{ and } \text{rm_name} = \text{'Bedroom 1'}} (\text{PAINT_COLOR} * \text{PAINTED})$$

$$\text{RESULT} \leftarrow \pi_{\text{first, last}} (\text{CUSTOMER} * \text{PINK_BEDROOM})$$

note: like question 3, if you use cross product plus select, or join, you need to join on all the foreign keys because for these relations they are part of the primary key. You need the entire primary key in the join to uniquely identify the tuple.