Assignment:

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For this task you are required to write the **relational algebra operations** for the following queries (your answer must show an understanding of query efficiency).

List of symbols for copying/pasting as you enter your answers below:

Task 1: Relational Database Queries - Relational Algebra (6 marks):

project:	π	select:	σ
join:	⋈	intersect:	∩
union:	∪	minus:	−

a. **List the carnival date, carnival name and location for all carnivals which have an event type code of "10K".   [1 mark]**

$R =$ $(\pi$ carn_date, carn_name, carn_location $CARNIVAL)$

   $⋈ (\pi$ carn_date $(\sigma$ eventtype_code $=$ "10K" $EVENT))$

answers to questions b. and c. on next page..

b. *List competitor number, first and last name and date of birth for any competitor who is registered by City Run but has as yet not registered for an event (added an entry).*
[2 marks]

(all competitors)

R1 = π comp_no, comp_fname, comp_lname, comp_dob COMPETITOR

(competitors who HAVE registered for an event)

R2 = (π comp_no, comp_fname, comp_lname, comp_dob COMPETITOR) ⋈ (π comp_no ENTRY)

(resulting relation)

R = R1 − R2

c. *List competitor number, first and last name, and their emergency contact's first name, last name and phone number for all competitors who registered in a carnival named "CR Summer Series Sydney 2023"'.   [3 marks]*

(details of all registered competitors and their emergency contact)
R1 =   (π_{comp_no}ENTRY) ⋈ ($\pi_{comp\_no, comp\_fname, comp\_lname, ec\_phone}$COMPETITOR)
         ⋈ ($\pi_{ec\_phone, ec\_fname, ec\_lname}$ EMERCONTACT)

(entries for carnivals named 'CR Summer Series Sydney 2023')
R2 =   (π_{carn_date}(σ_{carn_name} = "CR Summer Series Sydney 2023"CARNIVAL))
         ⋈ (π_{carn_date}EVENT) ⋈ (π_{carn_date}ENTRY)

(resulting relation)
R = R1 ∩ R2