T1-mns-ra.pdf

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TASK 1: Relational Database Queries - Relational Algebra (9 marks):

List of symbols for copying/pasting as you enter your answers below: project: π, select: σ, join: ⋈, intersect: ∩, union: ∪, minus: -

(a) List the id and description of all items which have never been used in any appointment service.

Solution:

R1 = $\pi_{item\_id, item\_description}$ ITEM
R2 = π_{item_id} APPTSERVICE_ITEM
R = R1 – R2

(b) List the patient number, patient first name, patient last name, emergency contact first name, emergency contact last name and emergency contact phone number of all patients who live in a city named Mooroolbark and had appointment/s on 08 September 2023.

Solution:

R1 = $\sigma_{appt\_datetime = '08\ September\ 2023'}$ APPOINTMENT

R2 = $\pi_{patient\_no, patient\_fname, patient\_lname, ec\_id}$ ($\sigma_{patient\_city = 'Mooroolbark'}$ PATIENT)

R3 = R2 ⋈ [patient_no=patient_no] R1

R4 = $\pi_{patient\_no, patient\_fname, patient\_lname, ec\_id}$ (R3 ⋈[patient_no=patient_no] PATIENT)

R = $\pi_{\text{patient\_no, patient\_fname, patient\_lname, ec\_id, ec\_fname, ec\_lname, ec\_phone}}$ (R4 ⋈[ec_id=ec_id] EMERGENCY_CONTACT)

(c) List the number, first name, last name and email address of all patients who have been attended by endodontists (i.e. providers who specialise in ENDODONTICS).

Solution:

R1 = $\sigma_{\text{spec\_id = 'ENDODONTICS'}}$ SPECIALISATION

R2 = $\pi_{\text{provider\_code}}$ (R1 ⋈ [spec_id = spec_id] PROVIDER)

R3 = $\pi_{\text{patient\_no}}$ APPOINTMENT

R4 = R2 ⋈ [provider_code = provider_code] APPOINTMENT

R5 = R4 ⋈ [patient_no = patient_no] PATIENT

R = $\pi_{\text{patient\_no, patient\_fname, patient\_lname, patient\_contactmail}}$ (R5)