Assignment 2B Sample Solution

TASK 1 Relational Algebra

Write the **relational algebra operations** for each Task 1 queries below (your answer must show an *understanding of query efficiency*).

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.

$T = \pi_{item\_id}ITEM - \pi_{item\_id}APPTSERV\_ITEM$

$R = (\pi_{item\_id,\ item\_description}ITEM) \bowtie T$

(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*.

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

$AP = \pi_{patient\_no}(\sigma_{appt\_datetime='08\ September\ 2023'}(APPOINTMENT)$

$APT = PT \bowtie AP$

$R3 = \pi_{patient\_no,\ patient\_fname,\ patient\_lname,\ ec\_fname,\ ec\_lname,\ ec\_phone}(APT \bowtie EMERGENCY\_CONTACT)$

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

$S = \pi_{spec\_id}(\sigma_{spec\_name\ ='ENDODONTICS'}\ SPECIALISATION)$

$SP = \pi_{provider\_code}(\pi_{provider\_code,\ spec\_id}PROVIDER \bowtie S)$

$AP = \pi_{patient\_no}\ ((\pi_{provider\_code,\ patient\_no}APPOINTMENT) \bowtie SP)$

$R = (\pi_{patient\_no,\ patient\_fname,\ patient\_lname,\ patient\_contactemail}PATIENT) \bowtie AP$

Correct but not efficient:

Max 50% of the allocated marks for each question.

Assignment 2B Sample Solution Run

```
SQL> --========================== START RUN ======================================---
SQL> -- Running T2-mns-select.sql
SQL>
SQL> @T2-mns-select.sql
SQL> SET ECHO ON
SQL> /*
SQL>a. List the id, description, standard cost and stock of all items
SQL>which have a stock of at least 50 items (a minimum of 50)
SQL>and include the word composite in their item description.
SQL>Show the items with the highest stock first.
SQL>If two items have the same number of items on hand (stock),
SQL>order them by their respective item id.
SQL>*/
SQL>
SQL> SELECT
  2      item_id,
  3      item_desc,
  4      lpad(to_char(item_stdcost,'$990.00'),13) as standard_cost,
  5      item_stock
  6  FROM
  7      mns.item
  8  WHERE
  9          item_stock >= 50
 10      AND lower(item_desc) LIKE '%composite%'
 11  ORDER BY
 12      item_stock desc, item_id;

   ITEM_ID ITEM_DESC                                          STANDARD_COST ITEM_STOCK
---------- -------------------------------------------------- ------------- ----------
        16 Universal composite                                       $48.00         99
        24 Disposable Composite-wedges with Tooth Gap                 $7.85         99
        17 Universal restorative composite                           $46.00         50

SQL>
SQL> /*
SQL>(b)
SQL>List the provider code and provider name in the form of Title.
SQL>FirstName LastName (e.g. Dr. Bruce Striplin) for all providers who specialise
SQL>in the area of PAEDIATRIC DENTISTRY (this is the specialisation description).
>>> Line cannot be encoded due to non-standard characters
SQL>if two providers have the same last name, order them by their respective first names,
SQL>then by their provider codes.*/
SQL>
SQL> SELECT
  2      provider_code,
  3      CASE provider_title
  4              WHEN NULL THEN
  5                  ''
  6              ELSE
  7                  provider_title || '. '
  8      END
  9      || TRIM(provider_fname
 10              || ' '
 11              || provider_lname) AS provider_name
 12  FROM
 13           mns.provider p
```

```
 14      JOIN mns.specialisation s
 15      ON p.spec_id = s.spec_id
 16  WHERE
 17      upper(spec_name) = 'PAEDIATRIC DENTISTRY'
 18  ORDER BY
 19      provider_lname,
 20      provider_fname,
 21      provider_code;

PROVID PROVIDER_NAME
------ --------------------------------------------------------------------------
PED001 Dr. Kevin Barr
PED002 Dr. Lee

SQL>
SQL> /*
SQL>(c) List the service code, description, and standard fee where the service
SQL>is more expensive than the average standard fee for all services.
SQL>The output must show the most expensive service first. The service standard fee
SQL>must be right aligned and displayed with two decimal digits and a leading $ symbol,
SQL>for example as $250.50. Where two or more services have the same standard
SQL>fee, order the output by service code.
SQL>*/
SQL>
SQL> SELECT
  2      service_code,
  3      service_desc,
  4      lpad(to_char(service_stdfee, '$9990.99'),
  5           12) AS standard_fee
  6  FROM
  7      mns.service
  8  WHERE
  9      service_stdfee > (
 10          SELECT
 11              AVG(service_stdfee)
 12          FROM
 13              mns.service
 14      )
 15  ORDER BY
 16      service_stdfee desc,
 17      service_code;

SERV SERVICE_DESC                                      STANDARD_FEE
---- ------------------------------------------------- ------------
OT02 Brace placement                                       $3000.00
DC02 Full crown - CEREC same day crown                     $1500.00
DC03 Full crown                                            $1200.00
OT03 Wire insertion                                        $1000.00
DT04 Denture fitting                                        $800.00
EX03 Dental bone grafts                                     $500.00
OT01 Design treatment                                       $500.00
EX02 Surgical removal of a tooth                            $425.00

8 rows selected.

SQL>
```

Assignment 2B Sample Solution Run

```
SQL> /*
SQL>(d) List the appointment number, appointment date time, patient number,
SQL>patient full name and appointment total cost (service fee/s + item fee/s)
SQL>for the most expensive appointment/s. The appointment total cost
SQL>must be right aligned and displayed with two decimal digits and a leading $ symbol,
SQL>for example as $2575.50. Where two or more appointments have the same appointment
SQL>total cost, order the output by appointment number.
SQL>*/
SQL>
SQL> SELECT
  2      a.appt_no,
  3      to_char(appt_datetime, 'dd/mm/yyyy hh24:mi') AS appointment_datetime,
  4      a.patient_no,
  5      trim(patient_fname || ' ' || patient_lname) as patient_fullname,
  6      lpad(to_char(nvl(SUM(apptserv_fee),
  7                       0) + nvl(SUM(apptserv_itemcost),
  8                                0),
  9                   '$99990.99'),
 10           21)                                        AS appointment_totalcost
 11  FROM
 12           mns.appointment a
 13      JOIN mns.appt_serv aps
 14      ON a.appt_no = aps.appt_no
 15      JOIN mns.patient p
 16      ON a.patient_no = p.patient_no
 17  WHERE
 18      appt_datetime <= sysdate  --condition for completed appointments
 19  GROUP BY
 20      a.appt_no,
 21      to_char(appt_datetime, 'dd/mm/yyyy hh24:mi'),
 22      a.patient_no,
 23      trim(patient_fname || ' ' || patient_lname)
 24  HAVING
 25      ( nvl(SUM(apptserv_fee),
 26            0) + nvl(SUM(apptserv_itemcost),
 27                     0) ) = (
 28          SELECT
 29              MAX(nvl(SUM(apptserv_fee),
 30                      0) + nvl(SUM(apptserv_itemcost),
 31                               0))
 32          FROM
 33                  mns.appointment a
 34              JOIN mns.appt_serv aps
 35              ON a.appt_no = aps.appt_no
 36          GROUP BY
 37              a.appt_no
 38      )
 39  ORDER BY
 40      a.appt_no;

   APPT_NO APPOINTMENT_DATE PATIENT_NO PATIENT_FULLNAME                                                  APPOINTMENT_TOTALCOST
---------- ---------------- ---------- ------------------------------------------------------------ --------------------
        22 14/09/2023 10:00         13 Rebecca Ricardo                                                         $3670.00

SQL>
SQL> /*
```

Assignment 2B Sample Solution Run

```
SQL>(e) Given a provider may charge more or less than the standard fee for a service
SQL>carried out during an appointment, the MNS administration is interested in finding out
SQL>what variations on the fee have been charged across all appointments.
SQL>The clinic terms the difference between the average actual charged service fee
SQL>and the service standard fee  as the "Service Fee Differential".
SQL>For all services which have been carried out during an appointment,
SQL>determine the service fee differential. The list should show the service code,
SQL>description, standard fee and the service fee differential in service code order.
SQL>
SQL>For example service D001 Oral Examination has a standard fee of $65.00,
SQL>it may have been charged on average across all appointments for $75.00
SQL>- the fee differential here will be 75 - 65 that is a fee differential +10.00.
SQL>If the average charge had been say 57.50 the fee differential will be -7.50.
SQL>*/
SQL>
SQL> SELECT
  2      service_code,
  3      service_desc,
  4      lpad(to_char(service_stdfee,
  5              '$99990.99'),12) AS "Standard Fee",
  6      lpad(to_char((
  7          SELECT
  8              AVG(apptserv_fee)
  9          FROM
 10              mns.appt_serv
 11          WHERE
 12              service_code = s.service_code
 13      ) - service_stdfee,
 14              '$99990.99'),24) AS "Service Fee Differential"
 15  FROM
 16      mns.service s
 17  WHERE
 18      service_code IN (
 19          SELECT
 20              service_code
 21          FROM
 22              mns.appt_serv
 23          WHERE
 24              apptserv_fee is not null
 25      )
 26  ORDER BY
 27      service_code;

SERV SERVICE_DESC                                      Standard Fee Service Fee Differential
---- ------------------------------------------------- ------------ ------------------------
D001 Oral examination                                       $65.00                   -$4.50
D002 Extended Consultation - 30 mins or more                $75.00                    $1.25
DC01 Preparation for crown                                 $175.00                    $0.00
DC03 Full crown                                           $1200.00                   $50.00
DF01 Anterior Filling (front teeth)                        $175.00                    $0.00
EX01 Removal of a tooth or part thereof                    $175.00                   $15.00
EX02 Surgical removal of a tooth                           $425.00                    $0.00
EX03 Dental bone grafts                                    $500.00                   $25.00
OT01 Design treatment                                      $500.00                   $20.00
OT02 Brace placement                                      $3000.00                 -$300.00
OT03 Wire insertion                                       $1000.00                 -$100.00
```

Assignment 2B Sample Solution Run

```
P001 Removal of plaque and / or stain                          $90.00                  -$6.88
P002 Removal of calculus                                      $165.00                 -$27.00
P003 Fissure sealing                                           $58.00                  -$3.00
PG01 Treatment of acute periodontal infection                 $170.00                   $0.00
RC01 Preparation of root canal - one canal                    $225.00                   $0.00
RC02 Preparation of root canal - each additional canal        $120.00                  $80.00
RC03 Root canal obturation - one canal                        $265.00                   $0.00
RC04 Root canal obturation - each additional canal            $120.00                 $120.00
X001 Intraoral radiograph - per x-ray                          $45.00                  $11.67

20 rows selected.

SQL>
SQL> -- Alternative
SQL> SELECT
  2      s.service_code,
  3      service_desc,
  4      lpad(to_char(service_stdfee,
  5              '$99990.99'),12) AS "Standard Fee",
  6      lpad(to_char(AVG(apptserv_fee) - service_stdfee,
  7              '$99990.99'),24) AS "Service Fee Differential"
  8  FROM
  9           mns.service s
 10      JOIN mns.appt_serv ps
 11      ON s.service_code = ps.service_code
 12  WHERE
 13      apptserv_fee IS NOT NULL
 14  GROUP BY
 15      s.service_code,
 16      service_desc,
 17      service_stdfee
 18  ORDER BY
 19      s.service_code;

SERV SERVICE_DESC                                      Standard Fee Service Fee Differential
---- ------------------------------------------------ ------------ ------------------------
D001 Oral examination                                       $65.00                  -$4.50
D002 Extended Consultation - 30 mins or more                $75.00                   $1.25
DC01 Preparation for crown                                 $175.00                   $0.00
DC03 Full crown                                           $1200.00                  $50.00
DF01 Anterior Filling (front teeth)                        $175.00                   $0.00
EX01 Removal of a tooth or part thereof                    $175.00                  $15.00
EX02 Surgical removal of a tooth                           $425.00                   $0.00
EX03 Dental bone grafts                                    $500.00                  $25.00
OT01 Design treatment                                      $500.00                  $20.00
OT02 Brace placement                                      $3000.00                -$300.00
OT03 Wire insertion                                       $1000.00                -$100.00
P001 Removal of plaque and / or stain                       $90.00                  -$6.88
P002 Removal of calculus                                   $165.00                 -$27.00
P003 Fissure sealing                                        $58.00                  -$3.00
PG01 Treatment of acute periodontal infection              $170.00                   $0.00
RC01 Preparation of root canal - one canal                 $225.00                   $0.00
RC02 Preparation of root canal - each additional canal     $120.00                  $80.00
RC03 Root canal obturation - one canal                     $265.00                   $0.00
RC04 Root canal obturation - each additional canal         $120.00                 $120.00
X001 Intraoral radiograph - per x-ray                       $45.00                  $11.67
```

```
20 rows selected.

SQL>
SQL> /*
SQL>(f)
SQL>List for all patients the percentage of their appointments which are follow up
SQL>appointments. For example if a patient has made three appointments, of which two
SQL>were followup appointments then this percentage will be 66.7%.
SQL>Display the patient number, full name, current age in years, number of appointments
SQL>which have been made and the percentage of those appointments which were followup
SQL>appointments. The image below shows the output you are required to produce, you
SQL> must use the same column headings, data formats and alignment.
SQL>
SQL>*/
SQL>
SQL> SELECT
  2      p.patient_no,
  3      ltrim(patient_fname
  4            || ' '
  5            || patient_lname)                                  AS patientname,
  6      floor(months_between(sysdate, patient_dob) / 12) AS currentage,
  7      COUNT(*)                                         AS numappts,
  8      lpad(to_char((
  9          SELECT
 10              COUNT(*)
 11          FROM
 12              mns.appointment ia
 13          WHERE
 14              ia.appt_prior_apptno IS NOT NULL
 15              AND ia.patient_no = p.patient_no
 16      ) * 100 / COUNT(*),
 17                   '90.9')
 18           || '%',
 19           9)                                          AS followups
 20  FROM
 21           mns.patient p
 22      JOIN mns.appointment a
 23      ON p.patient_no = a.patient_no
 24  GROUP BY
 25      p.patient_no,
 26      patient_fname
 27      || ' '
 28      || patient_lname,
 29      patient_dob
 30  ORDER BY
 31      patient_no;

PATIENT_NO PATIENTNAME                                                  CURRENTAGE   NUMAPPTS FOLLOWUPS
---------- ------------------------------------------------------------ ---------- ---------- ---------
         1 Jake Auld                                                            56          3     66.7%
         2 Roberts                                                              27          1      0.0%
         3 Darcy                                                                72          2     50.0%
         4 Marie-Rose Johnson                                                   13          1      0.0%
         5 Sally Johnson                                                        10          1      0.0%
         6 Gemma Hansman                                                        43          1      0.0%
```

Assignment 2B Sample Solution Run

```
         7 Charli Hansman                                                    7          1      0.0%
         8 Alice Bayldon                                                     7          2     50.0%
         9 Ashley Soares                                                    48          1      0.0%
        10 Imogen                                                           9          2     50.0%
        11 Joshua McBurney                                                  6          2      0.0%
        12 Thalia McBurney                                                  4          2      0.0%
        13 Rebecca Ricardo                                                 38          2     50.0%
        14 Jonathan Jageurs                                                62          2     50.0%
        15 Anthony Raggatt                                                 26          1      0.0%
        16 Lincoln Hansman                                                 51          1      0.0%

16 rows selected.

SQL>
SQL> --alternative solution
SQL> SELECT
  2      p.patient_no,
  3      TRIM(patient_fname
  4           || ' '
  5           || patient_lname)                              AS patientname,
  6      trunc(months_between(sysdate, patient_dob) / 12) AS currentage,
  7      COUNT(*)                                           AS numappts,
  8      lpad(to_char(COUNT(appt_prior_apptno) / COUNT(*) * 100,
  9                   '90.99')
 10           || '%',
 11           9)                                          AS followups
 12  FROM
 13           mns.appointment a
 14      JOIN mns.patient p
 15      ON a.patient_no = p.patient_no
 16  GROUP BY
 17      p.patient_no,
 18      patient_fname,
 19      patient_lname,
 20      trunc(months_between(sysdate, patient_dob) / 12)
 21  ORDER BY
 22      p.patient_no;

PATIENT_NO PATIENTNAME                                                  CURRENTAGE   NUMAPPTS FOLLOWUPS
---------- ---------------------------------------------------------- ---------- ---------- ---------
         1 Jake Auld                                                          56          3    66.67%
         2 Roberts                                                            27          1     0.00%
         3 Darcy                                                              72          2    50.00%
         4 Marie-Rose Johnson                                                 13          1     0.00%
         5 Sally Johnson                                                      10          1     0.00%
         6 Gemma Hansman                                                      43          1     0.00%
         7 Charli Hansman                                                      7          1     0.00%
         8 Alice Bayldon                                                       7          2    50.00%
         9 Ashley Soares                                                      48          1     0.00%
        10 Imogen                                                              9          2    50.00%
        11 Joshua McBurney                                                     6          2     0.00%
        12 Thalia McBurney                                                     4          2     0.00%
        13 Rebecca Ricardo                                                    38          2    50.00%
        14 Jonathan Jageurs                                                   62          2    50.00%
        15 Anthony Raggatt                                                    26          1     0.00%
        16 Lincoln Hansman                                                    51          1     0.00%
```

```
16 rows selected.

SQL>
SQL> /*
SQL>(g)
SQL>List for ALL providers the number of appointments they have had, the total fees they
SQL>have charged and the total quantity of all items that they have used for appointments which
SQL>took place between 9 AM on the 10th September 2023 and 5 PM on the 14th September 2023
SQL>(inclusive). If a particular provider has had no appointments in this period, or did
SQL>not collect fees, or used no items the output columns must show a dash (-) The image
SQL>below shows the output you are required to produce, you must use the same column
SQL>headings, data formats and alignment (all output is right aligned).
SQL>*/
SQL>
SQL> SELECT
  2      pcode,
  3      CASE
  4          WHEN COUNT(DISTINCT appt_no) = 0 THEN
  5              lpad('-', 11)
  6          ELSE
  7              lpad(to_char(COUNT(DISTINCT appt_no),
  8                           '999'),
  9                   11)
 10      END     AS numberappts,
 11      (
 12          SELECT
 13              lpad(ltrim(nvl(to_char(SUM(apptserv_fee),
 14                                     '$99,990.99'),
 15                             '-')),
 16                   10)
 17          FROM
 18              (
 19                  (
 20                      mns.provider
 21                      LEFT OUTER JOIN mns.appointment
 22                      ON provider.provider_code = appointment.provider_code
 23                         AND ( appt_datetime BETWEEN TO_DATE('10-Sep-2023 09:00', 'dd-Mon-yyyy hh24:mi'
 24                         ) AND TO_DATE('14-Sep-2023 17:00', 'dd-Mon-yyyy hh24:mi'
 25                         ) )
 26                  )
 27                  LEFT OUTER JOIN mns.appt_serv
 28                  USING ( appt_no )
 29              )
 30          WHERE
 31              provider.provider_code = pcode
 32          GROUP BY
 33              provider.provider_code
 34      )       AS totalfees,
 35      lpad(nvl(to_char(SUM(as_item_quantity),
 36                       '999'),
 37               '-'),
 38           7) AS noitems
 39  FROM
 40      (
 41          SELECT
```

Assignment 2B Sample Solution Run

```
 42              provider.provider_code AS pcode,
 43              appt_no,
 44              as_item_quantity
 45          FROM
 46              (
 47                  (
 48                      mns.provider
 49                      LEFT OUTER JOIN mns.appointment
 50                      ON provider.provider_code = appointment.provider_code
 51                         AND ( appt_datetime BETWEEN TO_DATE('10-Sep-2023 09:00', 'dd-Mon-yyyy hh24:mi'
 52                         ) AND TO_DATE('14-Sep-2023 17:00', 'dd-Mon-yyyy hh24:mi'
 53                         ) )
 54                  )
 55                  LEFT OUTER JOIN mns.appt_serv
 56                  USING ( appt_no )
 57              )
 58              LEFT OUTER JOIN mns.apptservice_item
 59              USING ( appt_no,
 60                      service_code )
 61      )
 62  GROUP BY
 63      pcode
 64  ORDER BY
 65      pcode;

PCODE  NUMBERAPPTS TOTALFEES  NOITEMS
------ ----------- ---------- -------
AST001           2    $400.00       -
AST002           -          -       -
END001           1    $505.00       7
GEN001           -          -       -
GEN002           3    $500.00       -
GEN003           -          -       -
ORS001           3    $340.00      10
ORT001           2  $4,200.00      44
PED001           1    $240.00       2
PED002           1    $350.00       2
PER001           1    $180.00       3
PER002           1    $160.00       2
PRO001           2  $1,425.00       -

13 rows selected.

SQL>
SQL> --============================== END RUN =======================================---
SQL> set echo off
```

Assignment 2B Sample Solution Run

```
SQL> --========================== START RUN ======================================---
SQL> -- Running T3-mns-json.sql
SQL>
SQL> @T3-mns-json.sql
SQL> set pagesize 50
SQL>
SQL> SELECT
  2      JSON_OBJECT(
  3          '_id' VALUE appt_no,
  4          'datetime' VALUE to_char(appt_datetime, 'dd/mm/yyyy hh24:mi'),
  5          'provider_code' VALUE provider_code,
  6          'provider_name' VALUE
  7              CASE provider_title
  8              WHEN NULL THEN ''
  9              ELSE
 10                  provider_title || '. '
 11              END
 12              || TRIM(provider_fname || ' ' || provider_lname),
 13          'items_totalcost' VALUE sum(as_item_quantity * item_stdcost),
 14          'no_of_items' VALUE COUNT(item_id),
 15          'items' VALUE JSON_ARRAYAGG(
 16              JSON_OBJECT(
 17                  'id' VALUE item_id,
 18                  'desc' VALUE item_desc,
 19                  'standardcost' VALUE item_stdcost,
 20                  'quantity' VALUE as_item_quantity
 21              )
 22          )
 23      FORMAT JSON)
 24          || ','
 25  FROM
 26           mns.appointment
 27      NATURAL JOIN mns.appt_serv
 28      NATURAL JOIN mns.apptservice_item
 29      NATURAL JOIN mns.item
 30      NATURAL JOIN mns.provider
 31  GROUP BY
 32      appt_no,
 33      appt_datetime,
 34      provider_code,
 35      provider_title,
 36      provider_fname,
 37      provider_lname
 38  order by appt_no;

JSON_OBJECT('_ID'VALUEAPPT_NO,'DATETIME'VALUETO_CHAR(APPT_DATETIME,'DD/MM/YYYYHH24:MI'),'PROVIDER_CODE'VALUEPROVIDER_CODE,'PROVIDER_NAME'VAL
UECASEPROVIDER_TITLEWHENNULLTHEN''ELSEPROVIDER_TITLE||'.'END||TRIM(PROVIDER_FNAME||''||PROVIDER_LNAME),'ITEMS_T
--------------------------------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------------------------------------
--------------------------------------------------------------------------------------------------------------------------------
----------------------------------------
{"_id":1,"datetime":"08/09/2023 10:00","provider_code":"ORS001","provider_name":"Dr. Jessica Jones","items_totalcost":80,"no_of_items":2,"it
ems":[{"id":20,"desc":"Phospor imaging plate","standardcost":75,"quantity":1},{"id":21,"desc":"Clinasept Film","standardcost":5,"quantity":1
}]},
{"_id":3,"datetime":"08/09/2023 12:00","provider_code":"ORS001","provider_name":"Dr. Jessica Jones","items_totalcost":27,"no_of_items":5,"it
```

Assignment 2B Sample Solution Run

ems":[{"id":1,"desc":"Paper tips","standardcost":1,"quantity":5},{"id":15,"desc":"Absorbable suture","standardcost":3,"quantity":2},{"id":8,
"desc":"Irrigation Needle and Syringe","standardcost":2,"quantity":1},{"id":7,"desc":"Portalimas sponges 1 cm","standardcost":0.5,"quantity"
:10},{"id":4,"desc":"Irrigation Solution 2% Chlorhexidine","standardcost":9,"quantity":1}]},
{"_id":5,"datetime":"08/09/2023 16:00","provider_code":"GEN001","provider_name":"Dr. Bruce Striplin","items_totalcost":75,"no_of_items":1,"i
tems":[{"id":20,"desc":"Phospor imaging plate","standardcost":75,"quantity":1}]},
{"_id":7,"datetime":"08/09/2023 12:00","provider_code":"GEN002","provider_name":"Dr. Amalia Morris","items_totalcost":78,"no_of_items":1,"it
ems":[{"id":18,"desc":"Fluid composite","standardcost":78,"quantity":1}]},
{"_id":8,"datetime":"08/09/2023 12:00","provider_code":"END001","provider_name":"Dr. Mark Stanton","items_totalcost":26,"no_of_items":3,"ite
ms":[{"id":4,"desc":"Irrigation Solution 2% Chlorhexidine","standardcost":9,"quantity":1},{"id":8,"desc":"Irrigation Needle and Syringe","st
andardcost":2,"quantity":1},{"id":6,"desc":"Universal Clamp","standardcost":15,"quantity":1}]},
{"_id":9,"datetime":"11/09/2023 15:00","provider_code":"ORS001","provider_name":"Dr. Jessica Jones","items_totalcost":5,"no_of_items":1,"ite
ms":[{"id":7,"desc":"Portalimas sponges 1 cm","standardcost":0.5,"quantity":10}]},
{"_id":10,"datetime":"11/09/2023 09:15","provider_code":"PER002","provider_name":"Dr. Joseph Hazelton","items_totalcost":8,"no_of_items":2,"
items":[{"id":2,"desc":"Sodium hypochlorite 5.25%","standardcost":6,"quantity":1},{"id":8,"desc":"Irrigation Needle and Syringe","standardco
st":2,"quantity":1}]},
{"_id":11,"datetime":"11/09/2023 15:00","provider_code":"PED002","provider_name":"Dr. Lee","items_totalcost":80,"no_of_items":2,"items":[{"i
d":20,"desc":"Phospor imaging plate","standardcost":75,"quantity":1},{"id":21,"desc":"Clinasept Film","standardcost":5,"quantity":1}]},
{"_id":18,"datetime":"14/09/2023 10:00","provider_code":"PER001","provider_name":"Dr. April Manahan","items_totalcost":10,"no_of_items":2,"i
tems":[{"id":2,"desc":"Sodium hypochlorite 5.25%","standardcost":6,"quantity":1},{"id":8,"desc":"Irrigation Needle and Syringe","standardcos
t":2,"quantity":2}]},
{"_id":19,"datetime":"14/09/2023 14:00","provider_code":"END001","provider_name":"Dr. Mark Stanton","items_totalcost":60,"no_of_items":3,"it
ems":[{"id":1,"desc":"Paper tips","standardcost":1,"quantity":5},{"id":16,"desc":"Universal composite","standardcost":48,"quantity":1},{"id"
:5,"desc":"Sterile K NiTi files","standardcost":7,"quantity":1}]},
{"_id":20,"datetime":"14/09/2023 09:00","provider_code":"PED001","provider_name":"Dr. Kevin Barr","items_totalcost":60,"no_of_items":2,"item
s":[{"id":22,"desc":"Porcelain Etch","standardcost":35,"quantity":1},{"id":23,"desc":"Silane","standardcost":25,"quantity":1}]},
{"_id":22,"datetime":"14/09/2023 10:00","provider_code":"ORT001","provider_name":"Dr. Gerry Elliott","items_totalcost":70,"no_of_items":4,"i
tems":[{"id":9,"desc":"Metal Bracket","standardcost":1.5,"quantity":20},{"id":12,"desc":"Curved lingual button","standardcost":1,"quantity":
8},{"id":11,"desc":"Archwire","standardcost":2,"quantity":4},{"id":10,"desc":"Molar mouth tube","standardcost":2,"quantity":12}]},

12 rows selected.

```
SQL>
SQL> --============================== END RUN =======================================---
SQL> set echo off
```

```
// *****PLEASE ENTER YOUR DETAILS BELOW*****
// T3-mns-mongo.mongodb.js

// SAMPLE SOLUTION

//Comments for your marker:

// ================================================================================
// Do not modify or remove any of the comments in this document (items marked with //)
// ================================================================================

//Use (connect to) your database - you MUST update xyz001
//with your authcate username

use("marker");

// 3(b)
// PLEASE PLACE REQUIRED MONGODB COMMAND TO CREATE THE COLLECTION HERE
// YOU MAY PICK ANY COLLECTION NAME
// ENSURE that your query is formatted and has a semicolon
// (;) at the end of this answer

//Drop collection
db.appointments.drop();

//Create collection and insert documents

db.appointments.insertMany([
  {
      "_id": 1,
      "datetime": "08/09/2023 10:00",
      "provider_code": "ORS001",
      "provider_name": "Dr. Jessica Jones",
      "items_totalcost": 80,
      "no_of_items": 2,
      "items": [
          {
              "id": 20,
              "desc": "Phospor imaging plate",
              "standardcost": 75,
              "quantity": 1
          },
          {
              "id": 21,
              "desc": "Clinasept Film",
              "standardcost": 5,
              "quantity": 1
          }
      ]
  },
  {
      "_id": 3,
      "datetime": "08/09/2023 12:00",
      "provider_code": "ORS001",
      "provider_name": "Dr. Jessica Jones",
      "items_totalcost": 27,
```

```
        "no_of_items": 5,
        "items": [
            {
                "id": 4,
                "desc": "Irrigation Solution 2% Chlorhexidine",
                "standardcost": 9,
                "quantity": 1
            },
            {
                "id": 1,
                "desc": "Paper tips",
                "standardcost": 1,
                "quantity": 5
            },
            {
                "id": 15,
                "desc": "Absorbable surture",
                "standardcost": 3,
                "quantity": 2
            },
            {
                "id": 7,
                "desc": "Portalimas sponges 1 cm",
                "standardcost": 0.5,
                "quantity": 10
            },
            {
                "id": 8,
                "desc": "Irrigation Needle and Syringe",
                "standardcost": 2,
                "quantity": 1
            }
        ]
    },
    {
        "_id": 5,
        "datetime": "08/09/2023 16:00",
        "provider_code": "GEN001",
        "provider_name": "Dr. Bruce Striplin",
        "items_totalcost": 75,
        "no_of_items": 1,
        "items": [
            {
                "id": 20,
                "desc": "Phospor imaging plate",
                "standardcost": 75,
                "quantity": 1
            }
        ]
    },
    {
        "_id": 7,
        "datetime": "08/09/2023 12:00",
        "provider_code": "GEN002",
        "provider_name": "Dr. Amalia Morris",
        "items_totalcost": 78,
```

```
        "no_of_items": 1,
        "items": [
            {
                "id": 18,
                "desc": "Fluid composite",
                "standardcost": 78,
                "quantity": 1
            }
        ]
    },
    {
        "_id": 8,
        "datetime": "08/09/2023 12:00",
        "provider_code": "END001",
        "provider_name": "Dr. Mark Stanton",
        "items_totalcost": 26,
        "no_of_items": 3,
        "items": [
            {
                "id": 4,
                "desc": "Irrigation Solution 2% Chlorhexidine",
                "standardcost": 9,
                "quantity": 1
            },
            {
                "id": 6,
                "desc": "Universal Clamp",
                "standardcost": 15,
                "quantity": 1
            },
            {
                "id": 8,
                "desc": "Irrigation Needle and Syringe",
                "standardcost": 2,
                "quantity": 1
            }
        ]
    },
    {
        "_id": 9,
        "datetime": "11/09/2023 15:00",
        "provider_code": "ORS001",
        "provider_name": "Dr. Jessica Jones",
        "items_totalcost": 5,
        "no_of_items": 1,
        "items": [
            {
                "id": 7,
                "desc": "Portalimas sponges 1 cm",
                "standardcost": 0.5,
                "quantity": 10
            }
        ]
    },
    {
        "_id": 10,
```

```
        "datetime": "11/09/2023 09:15",
        "provider_code": "PER002",
        "provider_name": "Dr. Joseph Hazelton",
        "items_totalcost": 8,
        "no_of_items": 2,
        "items": [
            {
                "id": 2,
                "desc": "Sodium hypochlorite 5.25%",
                "standardcost": 6,
                "quantity": 1
            },
            {
                "id": 8,
                "desc": "Irrigation Needle and Syringe",
                "standardcost": 2,
                "quantity": 1
            }
        ]
    },
    {
        "_id": 11,
        "datetime": "11/09/2023 15:00",
        "provider_code": "PED002",
        "provider_name": "Dr. Lee",
        "items_totalcost": 80,
        "no_of_items": 2,
        "items": [
            {
                "id": 20,
                "desc": "Phospor imaging plate",
                "standardcost": 75,
                "quantity": 1
            },
            {
                "id": 21,
                "desc": "Clinasept Film",
                "standardcost": 5,
                "quantity": 1
            }
        ]
    },
    {
        "_id": 18,
        "datetime": "14/09/2023 10:00",
        "provider_code": "PER001",
        "provider_name": "Dr. April Manahan",
        "items_totalcost": 10,
        "no_of_items": 2,
        "items": [
            {
                "id": 2,
                "desc": "Sodium hypochlorite 5.25%",
                "standardcost": 6,
                "quantity": 1
            },
```

```
            {
                "id": 8,
                "desc": "Irrigation Needle and Syringe",
                "standardcost": 2,
                "quantity": 2
            }
        ]
    },
    {
        "_id": 19,
        "datetime": "14/09/2023 14:00",
        "provider_code": "END001",
        "provider_name": "Dr. Mark Stanton",
        "items_totalcost": 60,
        "no_of_items": 3,
        "items": [
            {
                "id": 1,
                "desc": "Paper tips",
                "standardcost": 1,
                "quantity": 5
            },
            {
                "id": 5,
                "desc": "Sterile K NiTi files",
                "standardcost": 7,
                "quantity": 1
            },
            {
                "id": 16,
                "desc": "Universal composite",
                "standardcost": 48,
                "quantity": 1
            }
        ]
    },
    {
        "_id": 20,
        "datetime": "14/09/2023 09:00",
        "provider_code": "PED001",
        "provider_name": "Dr. Kevin Barr",
        "items_totalcost": 60,
        "no_of_items": 2,
        "items": [
            {
                "id": 22,
                "desc": "Porcelain Etch",
                "standardcost": 35,
                "quantity": 1
            },
            {
                "id": 23,
                "desc": "Silane",
                "standardcost": 25,
                "quantity": 1
            }
```

```
        ]
    },
    {
        "_id": 22,
        "datetime": "14/09/2023 10:00",
        "provider_code": "ORT001",
        "provider_name": "Dr. Gerry Elliott",
        "items_totalcost": 70,
        "no_of_items": 4,
        "items": [
            {
                "id": 9,
                "desc": "Metal Bracket",
                "standardcost": 1.5,
                "quantity": 20
            },
            {
                "id": 12,
                "desc": "Curved lingual button",
                "standardcost": 1,
                "quantity": 8
            },
            {
                "id": 11,
                "desc": "Archwire",
                "standardcost": 2,
                "quantity": 4
            },
            {
                "id": 10,
                "desc": "Molar mouth tube",
                "standardcost": 2,
                "quantity": 12
            }
        ]
    }
]);

// List all documents you added
db.appointments.find({});

// 3(c)
// PLEASE PLACE REQUIRED MONGODB COMMAND/S FOR THIS PART HERE
// ENSURE that your query is formatted and has a semicolon
// (;) at the end of this answer

db.appointments.find(
    { "$or":
        [{ "no_of_items": { "$gt": 2 } }, { "items_totalcost": { "$gt": 50 } }]
    }
);

// 3(d)
// PLEASE PLACE REQUIRED MONGODB COMMAND/S FOR THIS PART HERE
// ENSURE that your query is formatted and has a semicolon
// (;) at the end of this answer
```

```
db.appointments.updateMany(
    {"items.id": 1},
    {"$set":{"items.$.desc":"Paper points"}}
);

// Illustrate/confirm changes made
db.appointments.find(
    {"items.id": 1}
);

// 3(e)
// PLEASE PLACE REQUIRED MONGODB COMMAND/S FOR THIS PART HERE
// ENSURE that your query is formatted and has a semicolon
// (;) at the end of this answer

db.appointments.find(
    { _id : 20 }
);

db.appointments.updateOne(
    { _id : 20 },
    { "$push":
     { "items":
       { "id": 3, "desc": "EDTA Cleansing Gel 17%", "standardcost": 8, "quantity": 1 }
      }
    }
);

db.appointments.updateOne(
    { _id : 20 },
    { "$push":
     { "items":
       { "id": 4, "desc": "Irrigation Solution 2% Chlorhexidine", "standardcost": 9, "quantity": 1 }
     }
    }
);

db.appointments.updateOne(
    { _id : 20 },
    { "$push":
      { "items":
        { "id": 8, "desc": "Irrigation Needle and Syringe", "standardcost": 2, "quantity": 2 }
      }
    }
);

db.appointments.updateOne(
    { _id : 20 },
    { $inc: { "no_of_items": 3, "items_totalcost": (8+9+2*2) } }
);

// Illustrate/confirm changes made
db.appointments.find(
    { _id : 20 }
);
```

Task 3 MongoDB

```
>>============================== Start Mongo DB run of script ==============================
>> Task 3b ------------------------------------------------------------------------
>> Drop collection
false
{
  acknowledged: true,
  insertedIds: {
    '0': 1,
    '1': 3,
    '2': 5,
    '3': 7,
    '4': 8,
    '5': 9,
    '6': 10,
    '7': 11,
    '8': 18,
    '9': 19,
    '10': 20,
    '11': 22
  }
}
>> List all documents you added
[
  {
    _id: 1,
    datetime: '08/09/2023 10:00',
    provider_code: 'ORS001',
    provider_name: 'Dr. Jessica Jones',
    items_totalcost: 80,
    no_of_items: 2,
    items: [
      {
        id: 20,
        desc: 'Phospor imaging plate',
        standardcost: 75,
        quantity: 1
      },
      {
        id: 21,
        desc: 'Clinasept Film',
        standardcost: 5,
        quantity: 1
      }
    ]
  },
  {
    _id: 3,
    datetime: '08/09/2023 12:00',
    provider_code: 'ORS001',
    provider_name: 'Dr. Jessica Jones',
    items_totalcost: 27,
    no_of_items: 5,
    items: [
      {
        id: 4,
        desc: 'Irrigation Solution 2% Chlorhexidine',
```

```
        standardcost: 9,
        quantity: 1
      },
      {
        id: 1,
        desc: 'Paper tips',
        standardcost: 1,
        quantity: 5
      },
      {
        id: 15,
        desc: 'Absorbable surture',
        standardcost: 3,
        quantity: 2
      },
      {
        id: 7,
        desc: 'Portalimas sponges 1 cm',
        standardcost: 0.5,
        quantity: 10
      },
      {
        id: 8,
        desc: 'Irrigation Needle and Syringe',
        standardcost: 2,
        quantity: 1
      }
    ]
  },
  {
    _id: 5,
    datetime: '08/09/2023 16:00',
    provider_code: 'GEN001',
    provider_name: 'Dr. Bruce Striplin',
    items_totalcost: 75,
    no_of_items: 1,
    items: [
      {
        id: 20,
        desc: 'Phospor imaging plate',
        standardcost: 75,
        quantity: 1
      }
    ]
  },
  {
    _id: 7,
    datetime: '08/09/2023 12:00',
    provider_code: 'GEN002',
    provider_name: 'Dr. Amalia Morris',
    items_totalcost: 78,
    no_of_items: 1,
    items: [
      {
        id: 18,
        desc: 'Fluid composite',
```

```
      standardcost: 78,
      quantity: 1
    }
  ]
},
{
  _id: 8,
  datetime: '08/09/2023 12:00',
  provider_code: 'END001',
  provider_name: 'Dr. Mark Stanton',
  items_totalcost: 26,
  no_of_items: 3,
  items: [
    {
      id: 4,
      desc: 'Irrigation Solution 2% Chlorhexidine',
      standardcost: 9,
      quantity: 1
    },
    {
      id: 6,
      desc: 'Universal Clamp',
      standardcost: 15,
      quantity: 1
    },
    {
      id: 8,
      desc: 'Irrigation Needle and Syringe',
      standardcost: 2,
      quantity: 1
    }
  ]
},
{
  _id: 9,
  datetime: '11/09/2023 15:00',
  provider_code: 'ORS001',
  provider_name: 'Dr. Jessica Jones',
  items_totalcost: 5,
  no_of_items: 1,
  items: [
    {
      id: 7,
      desc: 'Portalimas sponges 1 cm',
      standardcost: 0.5,
      quantity: 10
    }
  ]
},
{
  _id: 10,
  datetime: '11/09/2023 09:15',
  provider_code: 'PER002',
  provider_name: 'Dr. Joseph Hazelton',
  items_totalcost: 8,
  no_of_items: 2,
```

```
    items: [
      {
        id: 2,
        desc: 'Sodium hypochlorite 5.25%',
        standardcost: 6,
        quantity: 1
      },
      {
        id: 8,
        desc: 'Irrigation Needle and Syringe',
        standardcost: 2,
        quantity: 1
      }
    ]
  },
  {
    _id: 11,
    datetime: '11/09/2023 15:00',
    provider_code: 'PED002',
    provider_name: 'Dr. Lee',
    items_totalcost: 80,
    no_of_items: 2,
    items: [
      {
        id: 20,
        desc: 'Phospor imaging plate',
        standardcost: 75,
        quantity: 1
      },
      {
        id: 21,
        desc: 'Clinasept Film',
        standardcost: 5,
        quantity: 1
      }
    ]
  },
  {
    _id: 18,
    datetime: '14/09/2023 10:00',
    provider_code: 'PER001',
    provider_name: 'Dr. April Manahan',
    items_totalcost: 10,
    no_of_items: 2,
    items: [
      {
        id: 2,
        desc: 'Sodium hypochlorite 5.25%',
        standardcost: 6,
        quantity: 1
      },
      {
        id: 8,
        desc: 'Irrigation Needle and Syringe',
        standardcost: 2,
        quantity: 2
```

```
      }
    ]
  },
  {
    _id: 19,
    datetime: '14/09/2023 14:00',
    provider_code: 'END001',
    provider_name: 'Dr. Mark Stanton',
    items_totalcost: 60,
    no_of_items: 3,
    items: [
      {
        id: 1,
        desc: 'Paper tips',
        standardcost: 1,
        quantity: 5
      },
      {
        id: 5,
        desc: 'Sterile K NiTi files',
        standardcost: 7,
        quantity: 1
      },
      {
        id: 16,
        desc: 'Universal composite',
        standardcost: 48,
        quantity: 1
      }
    ]
  },
  {
    _id: 20,
    datetime: '14/09/2023 09:00',
    provider_code: 'PED001',
    provider_name: 'Dr. Kevin Barr',
    items_totalcost: 60,
    no_of_items: 2,
    items: [
      {
        id: 22,
        desc: 'Porcelain Etch',
        standardcost: 35,
        quantity: 1
      },
      {
        id: 23,
        desc: 'Silane',
        standardcost: 25,
        quantity: 1
      }
    ]
  },
  {
    _id: 22,
    datetime: '14/09/2023 10:00',
```

```
    provider_code: 'ORT001',
    provider_name: 'Dr. Gerry Elliott',
    items_totalcost: 70,
    no_of_items: 4,
    items: [
      {
        id: 9,
        desc: 'Metal Bracket',
        standardcost: 1.5,
        quantity: 20
      },
      {
        id: 12,
        desc: 'Curved lingual button',
        standardcost: 1,
        quantity: 8
      },
      {
        id: 11,
        desc: 'Archwire',
        standardcost: 2,
        quantity: 4
      },
      {
        id: 10,
        desc: 'Molar mouth tube',
        standardcost: 2,
        quantity: 12
      }
    ]
  }
]
>> Task 3c ------------------------------------------------------------------------
[
  {
    _id: 1,
    datetime: '08/09/2023 10:00',
    provider_code: 'ORS001',
    provider_name: 'Dr. Jessica Jones',
    items_totalcost: 80,
    no_of_items: 2,
    items: [
      {
        id: 20,
        desc: 'Phospor imaging plate',
        standardcost: 75,
        quantity: 1
      },
      {
        id: 21,
        desc: 'Clinasept Film',
        standardcost: 5,
        quantity: 1
      }
    ]
  },
```

```
{
  _id: 3,
  datetime: '08/09/2023 12:00',
  provider_code: 'ORS001',
  provider_name: 'Dr. Jessica Jones',
  items_totalcost: 27,
  no_of_items: 5,
  items: [
    {
      id: 4,
      desc: 'Irrigation Solution 2% Chlorhexidine',
      standardcost: 9,
      quantity: 1
    },
    {
      id: 1,
      desc: 'Paper tips',
      standardcost: 1,
      quantity: 5
    },
    {
      id: 15,
      desc: 'Absorbable surture',
      standardcost: 3,
      quantity: 2
    },
    {
      id: 7,
      desc: 'Portalimas sponges 1 cm',
      standardcost: 0.5,
      quantity: 10
    },
    {
      id: 8,
      desc: 'Irrigation Needle and Syringe',
      standardcost: 2,
      quantity: 1
    }
  ]
},
{
  _id: 5,
  datetime: '08/09/2023 16:00',
  provider_code: 'GEN001',
  provider_name: 'Dr. Bruce Striplin',
  items_totalcost: 75,
  no_of_items: 1,
  items: [
    {
      id: 20,
      desc: 'Phospor imaging plate',
      standardcost: 75,
      quantity: 1
    }
  ]
},
```

```
{
  _id: 7,
  datetime: '08/09/2023 12:00',
  provider_code: 'GEN002',
  provider_name: 'Dr. Amalia Morris',
  items_totalcost: 78,
  no_of_items: 1,
  items: [
    {
      id: 18,
      desc: 'Fluid composite',
      standardcost: 78,
      quantity: 1
    }
  ]
},
{
  _id: 8,
  datetime: '08/09/2023 12:00',
  provider_code: 'END001',
  provider_name: 'Dr. Mark Stanton',
  items_totalcost: 26,
  no_of_items: 3,
  items: [
    {
      id: 4,
      desc: 'Irrigation Solution 2% Chlorhexidine',
      standardcost: 9,
      quantity: 1
    },
    {
      id: 6,
      desc: 'Universal Clamp',
      standardcost: 15,
      quantity: 1
    },
    {
      id: 8,
      desc: 'Irrigation Needle and Syringe',
      standardcost: 2,
      quantity: 1
    }
  ]
},
{
  _id: 11,
  datetime: '11/09/2023 15:00',
  provider_code: 'PED002',
  provider_name: 'Dr. Lee',
  items_totalcost: 80,
  no_of_items: 2,
  items: [
    {
      id: 20,
      desc: 'Phospor imaging plate',
      standardcost: 75,
```

```
        quantity: 1
      },
      {
        id: 21,
        desc: 'Clinasept Film',
        standardcost: 5,
        quantity: 1
      }
    ]
  },
  {
    _id: 19,
    datetime: '14/09/2023 14:00',
    provider_code: 'END001',
    provider_name: 'Dr. Mark Stanton',
    items_totalcost: 60,
    no_of_items: 3,
    items: [
      {
        id: 1,
        desc: 'Paper tips',
        standardcost: 1,
        quantity: 5
      },
      {
        id: 5,
        desc: 'Sterile K NiTi files',
        standardcost: 7,
        quantity: 1
      },
      {
        id: 16,
        desc: 'Universal composite',
        standardcost: 48,
        quantity: 1
      }
    ]
  },
  {
    _id: 20,
    datetime: '14/09/2023 09:00',
    provider_code: 'PED001',
    provider_name: 'Dr. Kevin Barr',
    items_totalcost: 60,
    no_of_items: 2,
    items: [
      {
        id: 22,
        desc: 'Porcelain Etch',
        standardcost: 35,
        quantity: 1
      },
      {
        id: 23,
        desc: 'Silane',
        standardcost: 25,
```

```
        quantity: 1
      }
    ]
  },
  {
    _id: 22,
    datetime: '14/09/2023 10:00',
    provider_code: 'ORT001',
    provider_name: 'Dr. Gerry Elliott',
    items_totalcost: 70,
    no_of_items: 4,
    items: [
      {
        id: 9,
        desc: 'Metal Bracket',
        standardcost: 1.5,
        quantity: 20
      },
      {
        id: 12,
        desc: 'Curved lingual button',
        standardcost: 1,
        quantity: 8
      },
      {
        id: 11,
        desc: 'Archwire',
        standardcost: 2,
        quantity: 4
      },
      {
        id: 10,
        desc: 'Molar mouth tube',
        standardcost: 2,
        quantity: 12
      }
    ]
  }
]
>> Task 3d ---------------------------------------------------------------------
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 2,
  modifiedCount: 2,
  upsertedCount: 0
}
>> Illustrate/confirm changes made
[
  {
    _id: 3,
    datetime: '08/09/2023 12:00',
    provider_code: 'ORS001',
    provider_name: 'Dr. Jessica Jones',
    items_totalcost: 27,
    no_of_items: 5,
```

```
    items: [
      {
        id: 4,
        desc: 'Irrigation Solution 2% Chlorhexidine',
        standardcost: 9,
        quantity: 1
      },
      {
        id: 1,
        desc: 'Paper points',
        standardcost: 1,
        quantity: 5
      },
      {
        id: 15,
        desc: 'Absorbable surture',
        standardcost: 3,
        quantity: 2
      },
      {
        id: 7,
        desc: 'Portalimas sponges 1 cm',
        standardcost: 0.5,
        quantity: 10
      },
      {
        id: 8,
        desc: 'Irrigation Needle and Syringe',
        standardcost: 2,
        quantity: 1
      }
    ]
  },
  {
    _id: 19,
    datetime: '14/09/2023 14:00',
    provider_code: 'END001',
    provider_name: 'Dr. Mark Stanton',
    items_totalcost: 60,
    no_of_items: 3,
    items: [
      {
        id: 1,
        desc: 'Paper points',
        standardcost: 1,
        quantity: 5
      },
      {
        id: 5,
        desc: 'Sterile K NiTi files',
        standardcost: 7,
        quantity: 1
      },
      {
        id: 16,
        desc: 'Universal composite',
```

```
        standardcost: 48,
        quantity: 1
      }
    ]
  }
]
>> Task 3e ----------------------------------------------------------------------
[
  {
    _id: 20,
    datetime: '14/09/2023 09:00',
    provider_code: 'PED001',
    provider_name: 'Dr. Kevin Barr',
    items_totalcost: 60,
    no_of_items: 2,
    items: [
      {
        id: 22,
        desc: 'Porcelain Etch',
        standardcost: 35,
        quantity: 1
      },
      {
        id: 23,
        desc: 'Silane',
        standardcost: 25,
        quantity: 1
      }
    ]
  }
]
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
```

```
  modifiedCount: 1,
  upsertedCount: 0
}
>> Illustrate/confirm changes made
[
  {
    _id: 20,
    datetime: '14/09/2023 09:00',
    provider_code: 'PED001',
    provider_name: 'Dr. Kevin Barr',
    items_totalcost: 81,
    no_of_items: 5,
    items: [
      {
        id: 22,
        desc: 'Porcelain Etch',
        standardcost: 35,
        quantity: 1
      },
      {
        id: 23,
        desc: 'Silane',
        standardcost: 25,
        quantity: 1
      },
      {
        id: 3,
        desc: 'EDTA Cleansing Gel 17%',
        standardcost: 8,
        quantity: 1
      },
      {
        id: 4,
        desc: 'Irrigation Solution 2% Chlorhexidine',
        standardcost: 9,
        quantity: 1
      },
      {
        id: 8,
        desc: 'Irrigation Needle and Syringe',
        standardcost: 2,
        quantity: 2
      }
    ]
  }
]
```