**Sultanate of Oman**

**Ministry of Higher Education**

**Sohar College of Applied Sciences**

**SFDV3007(Advanced Database Design)**

**Name:**

Problem area 1:**Update customer activity level**

**To solve this problem we will use Partition.**

select avg(Num\_Sales) from

(

( select count(\*) as Num\_Sales

from A2\_Sale\_Head

where Customer\_ID = 10

and Sale\_Date between add\_months(sysdate, -12) and

add\_months(sysdate, -9)

and Status = 'C'

)

union all

( select count(\*) as Num\_Sales

from A2\_Sale\_Head

where Customer\_ID = 10

and Sale\_Date between add\_months(sysdate, -9) and

add\_months(sysdate, -6)

and Status = 'C'

)

union all

( select count(\*) as Num\_Sales

from A2\_Sale\_Head

where Customer\_ID = 10

and Sale\_Date between add\_months(sysdate, -6) and

add\_months(sysdate, -3)

and Status = 'C'

)

union all

( select count(\*) as Num\_Sales

from A2\_Sale\_Head

where Customer\_ID = 10

and Sale\_Date between add\_months(sysdate, -3) and

add\_months(sysdate, -0)

and Status = 'C'

)

);

### Solution:

select avg(Num\_Sales) from

(

select round(Sale\_Date, 'Q') as Quarter\_Date,

count(\*) as Num\_Sales

from A2\_Sale\_Head

where Customer\_ID = 8

and Sale\_Date < sysdate

group by round(Sale\_Date, 'Q')

order by round(Sale\_Date, 'Q') desc

) where rownum < 3;

**Problem Area 2 Inventory staffs are complaining about the performance of retrieving new sales. (select statement+cost).**

**To solve this problem we will use index**

**Problem2:**

Select \* from A2\_SALE\_HEAD

WHERE STATUS=’P’;

**Solution:**

Create index sale\_head\_index on A2\_SALE\_HEAD(STATUS);

**Problem Area 7** Finalising the monthly accounts tends to overload the system.

You are required to provide a tuning solution for at least two of the following minor problem areas:

SELECT \* FROM A2\_SALE\_HEAD WHERE STATUS = 'p' and sale\_date between Add\_months(sysdate,-1) and Add\_months(sysdate,0);

SELECT SALARY FROM A2\_STAFF ,A2\_ORDER\_HEAD WHERE

A2\_STAFF.STAFF\_ID=A2\_ORDER\_HEAD.STAFF\_ID;

CREATE CLUSTER A2\_STAFF\_Cluster (STAFF\_ID NUMBER(7)) TABLESPACE O321B;

CREATE TABLE A2\_Staff

( Staff\_ID NUMBER(7),

--

Surname VARCHAR2(50)

CONSTRAINT Staff\_SURNAME\_NULL

NOT NULL,

--

Firstnames VARCHAR2(50)

CONSTRAINT Staff\_FIRSTNAMES\_NULL

NOT NULL,

--

Phone CHAR(9)

CONSTRAINT Staff\_PHONE\_NULL

NOT NULL,

--

Address VARCHAR2(150)

CONSTRAINT Staff\_ADDRESS\_NULL

NOT NULL,

--

Department VARCHAR2(18)

CONSTRAINT Staff\_DEPARTMENT\_NULL

NOT NULL

CONSTRAINT Staff\_DEPARTMENT\_INVALID

--

-- Yes, this should really be a lookup table :)

--

CHECK (Department IN ('Central Management',

'Sales & Marketing',

'Personnel',

'Manufacturing',

'Inventory',

'Accounts')),

--

Position VARCHAR2(20)

CONSTRAINT Staff\_POSITION\_NULL

NOT NULL

CONSTRAINT Staff\_POSITION\_INVALID

--

-- Yes, this should really be a lookup table too :)

--

CHECK (Position IN ('CEO', 'CTO', 'CFO', 'CIO', 'Director',

'President', 'Vice-President', 'Manager',

'Personal Assistant', 'Secretary',

'Technician', 'Researcher', 'Designer',

'Assembler', 'Programmer', 'Contractor',

'Sales Representative', 'Accountant',

'Inventory', 'Assistant')),

--

Salary NUMBER(8,2)

CONSTRAINT Staff\_SALARY\_NULL

NOT NULL

CONSTRAINT Staff\_SALARY\_TOO\_LOW

CHECK (Salary > 15000),

--

CONSTRAINT Staff\_PK

PRIMARY KEY (Staff\_ID)

)CLUSTER A2\_STAFF\_Cluster (STAFF\_ID );

CREATE TABLE A2\_Order\_Head

( Order\_Num NUMBER(10),

--

Order\_Date DATE

CONSTRAINT Order\_Head\_DATE\_NULL

NOT NULL,

--

Due\_Date DATE,

--

Status CHAR(1)

DEFAULT 'P'

CONSTRAINT Order\_Head\_STATUS\_NULL

NOT NULL

CONSTRAINT Order\_Head\_STATUS\_INVALID

CHECK (Status IN ('P', 'C')),

--

Staff\_ID NUMBER(7)

CONSTRAINT Order\_Head\_Staff\_ID\_NULL

NOT NULL,

--

Supplier\_ID NUMBER(7)

CONSTRAINT Order\_Head\_Supplier\_ID\_NULL

NOT NULL,

--

CONSTRAINT Order\_Head\_PK

PRIMARY KEY (Order\_Num),

--

CONSTRAINT Order\_Head\_FK\_TO\_Staff

FOREIGN KEY (Staff\_ID) REFERENCES A2\_Staff,

--

CONSTRAINT Order\_Head\_FK\_TO\_Supp

FOREIGN KEY (Supplier\_ID) REFERENCES A2\_Supplier

)CLUSTER A2\_STAFF\_Cluster (STAFF\_ID );

DROP TABLE A2\_Order\_Head CASCADE CONSTRAINT;

CREATE INDEX staff\_Cluster\_Index ON CLUSTER A2\_STAFF\_Cluster;

INSERT INTO A2\_STAFF SELECT \* FROM ASS2.A2\_STAFF;

**Problem Area 13**Adding new customers.

**To solve this problem we will use cluster**

**Problem 13**

SELECT \* FROM A2\_CUSTOMER;

**solution :**

CREATE CLUSTER A2\_CUSTOMER\_Cluster( CUSTOMER\_ID NUMBER(7)) TABLESPACE O321B;

CREATE INDEX A2\_CUSTOMER\_Cluster\_Index ON CLUSTER A2\_CUSTOMER\_Cluster;

Modify the table customer in BDL\_schema.sql:

- Customer table

--

CREATE TABLE A2\_Customer

( Customer\_ID NUMBER(7),

--

Name VARCHAR2(50)

CONSTRAINT Customer\_NAME\_NULL

NOT NULL,

--

Contact\_Person VARCHAR2(50)

CONSTRAINT Customer\_CONTACT\_NULL

NOT NULL,

--

Phone CHAR(9)

CONSTRAINT Customer\_PHONE\_NULL

NOT NULL,

--

Address VARCHAR2(150)

CONSTRAINT Customer\_ADDRESS\_NULL

NOT NULL,

--

Email VARCHAR2(50)

CONSTRAINT Customer\_EMAIL\_NULL

NOT NULL,

--

Activity NUMBER(5,2)

DEFAULT 0

CONSTRAINT Customer\_ACTIVITY\_NULL

NOT NULL

CONSTRAINT Customer\_ACTIVITY\_NEGATIVE

CHECK (Activity >= 0),

--

CONSTRAINT Customer\_PK

PRIMARY KEY (Customer\_ID)

)CLUSTER A2\_Customer\_Cluster (Customer\_ID);

**Problem Area 12**Generating monthly salaries.

**To solve this problem we will useIndex**

Problem12

select Salary from A2\_Staff;

**solution :**

create Bitmap Index sal\_Index on A2\_Staff(Salary);

CREATE TABLE A2\_Staff

( Staff\_ID NUMBER(7),

--

Surname VARCHAR2(50)

CONSTRAINT Staff\_SURNAME\_NULL

NOT NULL,

--

Firstnames VARCHAR2(50)

CONSTRAINT Staff\_FIRSTNAMES\_NULL

NOT NULL,

--

Phone CHAR(9)

CONSTRAINT Staff\_PHONE\_NULL

NOT NULL,

--

Address VARCHAR2(150)

CONSTRAINT Staff\_ADDRESS\_NULL

NOT NULL,

--

Department VARCHAR2(18)

CONSTRAINT Staff\_DEPARTMENT\_NULL

NOT NULL

CONSTRAINT Staff\_DEPARTMENT\_INVALID

--

-- Yes, this should really be a lookup table :)

--

CHECK (Department IN ('Central Management',

'Sales & Marketing',

'Personnel',

'Manufacturing',

'Inventory',

'Accounts')),

--

Position VARCHAR2(20)

CONSTRAINT Staff\_POSITION\_NULL

NOT NULL

CONSTRAINT Staff\_POSITION\_INVALID

--

-- Yes, this should really be a lookup table too :)

--

CHECK (Position IN ('CEO', 'CTO', 'CFO', 'CIO', 'Director',

'President', 'Vice-President', 'Manager',

'Personal Assistant', 'Secretary',

'Technician', 'Researcher', 'Designer',

'Assembler', 'Programmer', 'Contractor',

'Sales Representative', 'Accountant',

'Inventory', 'Assistant')),

--

Salary NUMBER(8,2)

CONSTRAINT Staff\_SALARY\_NULL

NOT NULL

CONSTRAINT Staff\_SALARY\_TOO\_LOW

CHECK (Salary > 15000),

--

CONSTRAINT Staff\_PK

PRIMARY KEY (Staff\_ID)

);