

Data Warehouse (TP3)

Fonction analytique_ Using SQL Server

ANNASSIRI Fatima Zahra

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Exercice 1 :

La création des tables Emp et Dept du compte Scott dans la base de données SQL :

```
CREATE TABLE dept(deptno INT NOT NULL, dname VARCHAR(14), loc VARCHAR(13));

INSERT INTO dept VALUES(10, 'ACCOUNTING', 'NEW YORK');
INSERT INTO dept VALUES(20, 'RESEARCH', 'DALLAS');
INSERT INTO dept VALUES(30, 'SALES', 'CHICAGO');
INSERT INTO dept VALUES(40, 'OPERATIONS', 'BOSTON');

SELECT * FROM dept;
```

Les résultats donnés par :

	deptno	dname	loc
1	10	ACCOUNTING	NEW YORK
2	20	RESEARCH	DALLAS
3	30	SALES	CHICAGO
4	40	OPERATIONS	BOSTON

Création de la table Emp :

```
CREATE TABLE emp (empno INT NOT NULL, ename VARCHAR(10),
job VARCHAR(9), mgr INT, hiredate DATE, sal decimal, comm INT, deptno INT);

INSERT INTO emp VALUES(7369, 'SMITH', 'CLERK', 7902, '1980-12-17', 800, NULL, 20);
INSERT INTO emp VALUES(7499, 'ALLEN', 'SALESMAN', 7698, '1981-02-20', 1600, 300, 30);
INSERT INTO emp VALUES(7521, 'WARD', 'SALESMAN', 7698, '1981-02-22', 1250, 500, 30);
INSERT INTO emp VALUES(7566, 'JONES', 'MANAGER', 7839, '1981-04-02', 2975, NULL, 20);
INSERT INTO emp VALUES(7654, 'MARTIN', 'SALESMAN', 7698, '1981-09-28', 1250, 1400, 30);
INSERT INTO emp VALUES(7698, 'BLAKE', 'MANAGER', 7839, '1981-05-01', 2850, NULL, 30);
INSERT INTO emp VALUES(7782, 'CLARK', 'MANAGER', 7839, '1981-06-09', 2450, NULL, 10);
INSERT INTO emp VALUES(7788, 'SCOTT', 'ANALYST', 7566, '1981-04-19', 3000, NULL, 20);
INSERT INTO emp VALUES(7839, 'KING', 'PRESIDENT', NULL, '1981-11-17', 5000, NULL, 10);
INSERT INTO emp VALUES(7844, 'TURNER', 'SALESMAN', 7698, '1981-09-08', 1500, NULL, 30);
INSERT INTO emp VALUES(7876, 'ADAMS', 'CLERK', 7788, '1987-05-23', 1100, NULL, 20);
INSERT INTO emp VALUES(7900, 'JAMES', 'CLERK', 7698, '1981-12-03', 950, NULL, 30);
INSERT INTO emp VALUES(7902, 'FORD', 'ANALYST', 7566, '1981-12-03', 3000, NULL, 20);
INSERT INTO emp VALUES(7934, 'MILLER', 'CLERK', 7782, '1982-01-23', 1300, NULL, 10);
```

	empno	ename	job	mgr	hiredate	sal	comm	deptno
1	7369	SMITH	CLERK	7902	1980-12-17	800	NULL	20
2	7499	ALLEN	SALESMAN	7698	1981-02-20	1600	300	30
3	7521	WARD	SALESMAN	7698	1981-02-22	1250	500	30
4	7566	JONES	MANAGER	7839	1981-04-02	2975	NULL	20
5	7654	MARTIN	SALESMAN	7698	1981-09-28	1250	1400	30
6	7698	BLAKE	MANAGER	7839	1981-05-01	2850	NULL	30
7	7782	CLARK	MANAGER	7839	1981-06-09	2450	NULL	10
8	7788	SCOTT	ANALYST	7566	1981-04-19	3000	NULL	20
9	7839	KING	PRESIDENT	NULL	1981-11-17	5000	NULL	10
10	7844	TURNER	SALESMAN	7698	1981-09-08	1500	NULL	30
11	7876	ADAMS	CLERK	7788	1987-05-23	1100	NULL	20
12	7900	JAMES	CLERK	7698	1981-12-03	950	NULL	30
13	7902	FORD	ANALYST	7566	1981-12-03	3000	NULL	20
14	7934	MILLER	CLERK	7782	1982-01-23	1300	NULL	10

Question 1 :

Donner le nombre d'employés et le salaire moyen par département et par emploi :

```
SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], [job];
```

```
SELECT * FROM emp;
--> Q1
```

```
SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], [job];
```

	dname	job	nombre employés	salaire moyen
1	RESEARCH	ANALYST	2	3000.000000
2	ACCOUNTING	CLERK	1	1300.000000
3	RESEARCH	CLERK	2	950.000000
4	SALES	CLERK	1	950.000000
5	ACCOUNTING	MANAGER	1	2450.000000
6	RESEARCH	MANAGER	1	2975.000000
7	SALES	MANAGER	1	2850.000000
8	ACCOUNTING	PRESIDENT	1	5000.000000
9	SALES	SALESMAN	4	1400.000000

Question 2 :

Donner le nombre d'employés et le salaire moyen par département et par emploi :

- **Proposition n°1 : SQL du base**

```
SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], [job]
UNION ALL
SELECT [dname]
      ,NULL
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
```

```

FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname];

```

SQL Query Editor:

```

SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], [job]
UNION ALL
SELECT [dname]
      ,NULL
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname];

```

100 %

Results Messages

	dname	job	nombre employés	salaire moyen
1	RESEARCH	ANALYST	2	3000.000000
2	ACCOUNTING	CLERK	1	1300.000000
3	RESEARCH	CLERK	2	950.000000
4	SALES	CLERK	1	950.000000
5	ACCOUNTING	MANAGER	1	2450.000000
6	RESEARCH	MANAGER	1	2975.000000
7	SALES	MANAGER	1	2850.000000
8	ACCOUNTING	PRESIDENT	1	5000.000000
9	SALES	SALESMAN	4	1400.000000
10	ACCOUNTING	NULL	3	2916.666666
11	RESEARCH	NULL	5	2175.000000
12	SALES	NULL	6	1566.666666

- Proposition n°2 : using Grouping SET

```

SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employé's'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY
  GROUPING SETS (
    ([dname], [job]),
    ([dname])
  );

```

```

SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d
WHERE e.deptno = d.deptno
GROUP BY
    GROUPING SETS (
        ([dname], [job]),
        ([dname])
    );

```

100 %

Results Messages

	dname	job	nombre employés	salaire moyen
1	ACCOUNTING	CLERK	1	1300.000000
2	ACCOUNTING	MANAGER	1	2450.000000
3	ACCOUNTING	PRESIDENT	1	5000.000000
4	ACCOUNTING	NULL	3	2916.666666
5	RESEARCH	ANALYST	2	3000.000000
6	RESEARCH	CLERK	2	950.000000
7	RESEARCH	MANAGER	1	2975.000000
8	RESEARCH	NULL	5	2175.000000
9	SALES	CLERK	1	950.000000
10	SALES	MANAGER	1	2850.000000
11	SALES	SALESMAN	4	1400.000000
12	SALES	NULL	6	1566.666666

- Proposition n°3 : using Group BY ROLLUP OR ROLLUP

```

SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY ROLLUP([dname], [job]);

```

USING ROLLUP

```

SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employé's'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], ROLLUP ([job]);

```

```

SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d
WHERE e.deptno = d.deptno
GROUP BY ROLLUP([dname], [job]);

```

100 %

Results Messages

	dname	job	nombre employés	salaire moyen
1	ACCOUNTING	CLERK	1	1300.000000
2	ACCOUNTING	MANAGER	1	2450.000000
3	ACCOUNTING	PRESIDENT	1	5000.000000
4	ACCOUNTING	NULL	3	2916.666666
5	RESEARCH	ANALYST	2	3000.000000
6	RESEARCH	CLERK	2	950.000000
7	RESEARCH	MANAGER	1	2975.000000
8	RESEARCH	NULL	5	2175.000000
9	SALES	CLERK	1	950.000000
10	SALES	MANAGER	1	2850.000000
11	SALES	SALESMAN	4	1400.000000
12	SALES	NULL	6	1566.666666
13	NULL	NULL	14	2073.214285

Question 3 :

Mêmes questions qu'en 2, mais utiliser les fonctions CASE WHEN...THEN... ELSE... END et GROUPING pour améliorer l'affichage :

```

SELECT GROUPING([dname])
      ,GROUPING([job])
      ,[dname]
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], ROLLUP ([job]);

SELECT CASE
      WHEN GROUPING([dname]) = 0 THEN [dname]
      ELSE 'ALL'
END 'dname'
      ,CASE

```

```

        WHEN GROUPING([job]) = 0 THEN [job]
        ELSE 'ALL'
    END 'job'
    ,COUNT([empno]) 'nombre employés'
    ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], ROLLUP ([job]);

SELECT [dname]
    ,CASE
        WHEN GROUPING([job]) = 0 THEN [job]
        ELSE 'ALL'
    END 'job'
    ,COUNT([empno]) 'nombre employés'
    ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], ROLLUP ([job]);

```

SQL Editor View:

```

SELECT [dname]
    ,CASE
        WHEN GROUPING([job]) = 0 THEN [job]
        ELSE 'ALL'
    END 'job'
    ,COUNT([empno]) 'nombre employés'
    ,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], ROLLUP ([job]);

```

100 %

Results Messages

	dname	job	nombre employés	salaire moyen
1	ACCOUNTING	CLERK	1	1300.000000
2	ACCOUNTING	MANAGER	1	2450.000000
3	ACCOUNTING	PRESIDENT	1	5000.000000
4	ACCOUNTING	ALL	3	2916.666666
5	RESEARCH	ANALYST	2	3000.000000
6	RESEARCH	CLERK	2	950.000000
7	RESEARCH	MANAGER	1	2975.000000
8	RESEARCH	ALL	5	2175.000000
9	SALES	CLERK	1	950.000000
10	SALES	MANAGER	1	2850.000000
11	SALES	SALESMAN	4	1400.000000
12	SALES	ALL	6	1566.666666

Question 4 :

Mêmes questions qu'en 3 en ajoutant l'année d'embauche comme dimension :

```

SELECT [dname]
      ,CASE
        WHEN GROUPING([job]) = 0 THEN [job]
        ELSE 'ALL'
      END 'job'
      ,[hiredate]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], ROLLUP ([job], [hiredate]);

```

SELECT [dname]
 ,CASE
 WHEN GROUPING([job]) = 0 THEN [job]
 ELSE 'ALL'
 END 'job'
 ,[hiredate]
 ,COUNT([empno]) 'nombre employés'
 ,AVG([sal]) 'salaire moyen'
 FROM [emp] e, [dept] d
 WHERE e.deptno = d.deptno
 GROUP BY [dname], ROLLUP ([job], [hiredate]);

----- Q5

100 %

Results Messages

	dname	job	hiredate	nombre employés	salaire moyen
1	ACCOUNTING	CLERK	1982-01-23	1	1300.000000
2	ACCOUNTING	CLERK	NULL	1	1300.000000
3	ACCOUNTING	MANAGER	1981-06-09	1	2450.000000
4	ACCOUNTING	MANAGER	NULL	1	2450.000000
5	ACCOUNTING	PRESIDENT	1981-11-17	1	5000.000000
6	ACCOUNTING	PRESIDENT	NULL	1	5000.000000
7	ACCOUNTING	ALL	NULL	3	2916.666666
8	RESEARCH	ANALYST	1981-04-19	1	3000.000000
9	RESEARCH	ANALYST	1981-12-03	1	3000.000000
10	RESEARCH	ANALYST	NULL	2	3000.000000
11	RESEARCH	CLERK	1980-12-17	1	800.000000
12	RESEARCH	CLERK	1987-05-23	1	1100.000000
13	RESEARCH	CLERK	NULL	2	950.000000
14	RESEARCH	MANAGER	1981-04-02	1	2975.000000

Question 5 :

Même question que 3 mais en ajoutant tous les sous-totaux. Proposer une solution en SQL de base et une solution utilisant la clause CUBE.

- **Solution de base SQL :**

```

SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname], [job]
UNION ALL
SELECT [dname]
      , 'NONE'
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [dname]
UNION ALL
SELECT 'NONE'
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY [job]
UNION ALL
SELECT 'NONE'
      , 'NONE'
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno;

```



```

SELECT [dname]
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d WHERE e.deptno = d.deptno
GROUP BY [dname], [job]
UNION ALL
SELECT [dname]
      ,'NONE'
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d WHERE e.deptno = d.deptno
GROUP BY [dname]
UNION ALL
SELECT 'NONE'
      ,[job]
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d WHERE e.deptno = d.deptno
GROUP BY [job]
UNION ALL
SELECT 'NONE'
      ,'NONE'
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d WHERE e.deptno = d.deptno;

```

100 %

Results Messages

	dname	job	nombre employés	salaire moyen
1	RESEARCH	ANALYST	2	3000.000000
2	ACCOUNTING	CLERK	1	1300.000000
3	RESEARCH	CLERK	2	950.000000
4	SALES	CLERK	1	950.000000
5	ACCOUNTING	MANAGER	1	2450.000000

- **Solution avec la clause CUBE :**

```

SELECT CASE
  WHEN GROUPING([dname]) = 0 THEN [dname]
  ELSE 'NONE'
END 'dname'
      ,CASE
  WHEN GROUPING([job]) = 0 THEN [job]
  ELSE 'NONE'
END 'job'
      ,COUNT([empno]) 'nombre employés'
      ,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY CUBE ([dname], [job]);

```

```

SELECT CASE
    WHEN GROUPING([dname]) = 0 THEN [dname]
    ELSE 'NONE'
END 'dname'
,CASE
    WHEN GROUPING([job]) = 0 THEN [job]
    ELSE 'NONE'
END 'job'
,COUNT([empno]) 'nombre employés'
,AVG([sal]) 'salaire moyen'
FROM [emp] e, [dept] d
WHERE e.deptno = d.deptno
GROUP BY CUBE ([dname], [job]);

```

100 %

Results Messages

	dname	job	nombre employés	salaire moyen
1	RESEARCH	ANALYST	2	3000.000000
2	NONE	ANALYST	2	3000.000000
3	ACCOUNTING	CLERK	1	1300.000000
4	RESEARCH	CLERK	2	950.000000
5	SALES	CLERK	1	950.000000
6	NONE	CLERK	4	1037.500000
7	ACCOUNTING	MANAG...	1	2450.000000
8	RESEARCH	MANAG...	1	2975.000000
9	SALES	MANAG...	1	2850.000000
10	NONE	MANAG...	3	2758.333333
11	ACCOUNTING	PRESID...	1	5000.000000
12	NONE	PRESID...	1	5000.000000
13	SALES	SALES...	4	1400.000000
14	NONE	SALES...	4	1400.000000
15	NONE	NONE	14	2073.214285

Question 6 :

Même question que 5, mais en ajoutant l'année d'embauche comme dimension :

```

SELECT CASE
    WHEN GROUPING([dname]) = 0 THEN [dname]
    ELSE 'NONE'
END 'dname'
,CASE
    WHEN GROUPING([job]) = 0 THEN [job]
    ELSE 'NONE'
END 'job'
,[hiredate]
,COUNT([empno]) 'nombre employés'
,AVG([sal]) 'salaire moyen'
FROM [tp2-fa].[dbo].[emp] e, [tp2-fa].[dbo].[dept] d
WHERE e.deptno = d.deptno
GROUP BY CUBE ([dname], [job], [hiredate]);

```

```

SELECT CASE
    WHEN GROUPING([dname]) = 0 THEN [dname]
    ELSE 'NONE'
END 'dname'
,CASE
    WHEN GROUPING([job]) = 0 THEN [job]
    ELSE 'NONE'
END 'job'
,[hiredate]
,COUNT([empno]) 'nombre employés'
,AVG([sal]) 'salaire moyen'
FROM .[emp] e, [dept] d
WHERE e.deptno = d.deptno
GROUP BY CUBE ([dname], [job], [hiredate]);

```

	dname	job	nombre employés	salaire moyen
1	RESEARCH	ANALYST	2	3000.000000
2	NONE	ANALYST	2	3000.000000
3	ACCOUNTING	CLERK	1	1300.000000
4	RESEARCH	CLERK	2	950.000000
5	SALES	CLERK	1	950.000000
6	NONE	CLERK	4	1037.500000
7	ACCOUNTING	MANAG...	1	2450.000000
8	RESEARCH	MANAG...	1	2975.000000
9	SALES	MANAG...	1	2850.000000
10	NONE	MANAG...	3	2758.333333
11	ACCOUNTING	PRESID...	1	5000.000000
12	NONE	PRESID...	1	5000.000000
13	SALES	SALES...	4	1400.000000
14	NONE	SALES...	4	1400.000000
15	NONE	NONE	14	2073.214286

Exercice 2 :

La création et le remplissage des tables : Chicago, Toronto et Vancouver.

```

---table Chicago -----
CREATE TABLE chicago(item VARCHAR(15), periode DATE, qte INTEGER);
INSERT INTO chicago VALUES('Tel. fixe', '1999-01-01', 25);
INSERT INTO chicago VALUES('Tel. portable', '1999-01-01', 15);
INSERT INTO chicago VALUES('PC bureau', '1999-02-01', 8);
INSERT INTO chicago VALUES('PC portable', '1999-02-01', 12);
INSERT INTO chicago VALUES('Micro onde', '1999-03-01', 3);
INSERT INTO chicago VALUES('Mixeur', '2000-02-01', 4);
INSERT INTO chicago VALUES('Grille-pain', '2000-03-01', 3);

```

Le resultat donné par :

```

SELECT * FROM chicago;

```

Results Messages			
	item	periode	qte
1	Tel. fixe	1999-01-01	25
2	Tel. portable	1999-01-01	15
3	PC bureau	1999-02-01	8
4	PC portable	1999-02-01	12
5	Micro onde	1999-03-01	3
6	Mixeur	2000-02-01	4
7	Grille-pain	2000-03-01	3

```

---table Toronto -----
CREATE TABLE toronto(item VARCHAR(15), periode DATE, qte INTEGER);
INSERT INTO toronto VALUES('Tel. fixe', '1999-02-01', 11);
INSERT INTO toronto VALUES('Tel. portable', '1999-02-01', 9);
INSERT INTO toronto VALUES('PC bureau', '1999-05-01', 13);
INSERT INTO toronto VALUES('PC portable', '1999-06-01', 7);
INSERT INTO toronto VALUES('Micro onde', '1999-01-01', 5);
INSERT INTO toronto VALUES('Mixeur', '2000-01-01', 7);
INSERT INTO toronto VALUES('Grille-pain', '2000-03-01', 8);

```

Le resultat donné par :

```
SELECT * FROM toronto;
```

Results Messages			
	item	periode	qte
1	Tel. fixe	1999-02-01	11
2	Tel. portable	1999-02-01	9
3	PC bureau	1999-05-01	13
4	PC portable	1999-06-01	7
5	Micro onde	1999-01-01	5
6	Mixeur	2000-01-01	7
7	Grille-pain	2000-03-01	8

```

--- table vancouver -----
CREATE TABLE vancouver(item VARCHAR(15), periode DATE, qte INTEGER);
INSERT INTO vancouver VALUES('Tel. fixe', '1999-10-01', 15);
INSERT INTO vancouver VALUES('Tel. portable', '1999-12-01', 5);
INSERT INTO vancouver VALUES('PC bureau', '1999-06-01', 2);
INSERT INTO vancouver VALUES('PC portable', '1999-07-01', 8);
INSERT INTO vancouver VALUES('Micro onde', '1999-02-01', 10);
INSERT INTO vancouver VALUES('Mixeur', '2000-02-01', 5);
INSERT INTO vancouver VALUES('Grille-pain', '2000-01-01', 5);

```

Le résultat est donné par :

```
SELECT * FROM vancouver;
```

Results		Messages	
	item	periode	qte
1	Tel. fixe	1999-10-01	15
2	Tel. portable	1999-12-01	5
3	PC bureau	1999-06-01	2
4	PC portable	1999-07-01	8
5	Micro onde	1999-02-01	10
6	Mixeur	2000-02-01	5
7	Grille-pain	2000-01-01	5

Question 1 :

Donner le nombre Faire une requête pour obtenir une table Ventes ayant pour attribut Ville, Période, Item, Qte, regroupant les informations des trois villes. et le salaire moyen par département et par emploi :

```
SELECT * INTO ventes FROM
(SELECT 'chicago' as 'ville', *
FROM [tp2-fa].[dbo].[chicago]
UNION ALL
SELECT 'toronto' as 'ville', *
FROM [tp2-fa].[dbo].[toronto]
UNION ALL
SELECT 'vancouver' as 'ville', *
FROM [tp2-fa].[dbo].[vancouver]) AS ventes;
```

Results Messages

	ville	item	periode	qte
1	chicago	Tel. fixe	1999-01-01	25
2	chicago	Tel. portable	1999-01-01	15
3	chicago	PC bureau	1999-02-01	8
4	chicago	PC portable	1999-02-01	12
5	chicago	Micro onde	1999-03-01	3
6	chicago	Mixeur	2000-02-01	4
7	chicago	Grille-pain	2000-03-01	3
8	toronto	Tel. fixe	1999-02-01	11
9	toronto	Tel. portable	1999-02-01	9
10	toronto	PC bureau	1999-05-01	13
11	toronto	PC portable	1999-06-01	7
12	toronto	Micro onde	1999-01-01	5
13	toronto	Mixeur	2000-01-01	7
14	toronto	Grille-pain	2000-03-01	8

Question 2 :

Construire le cube de données du total des ventes selon les dimensions ville, année et item :

```

SELECT CASE
    WHEN GROUPING([ville]) = 0 THEN [ville]
    ELSE 'ALL'
END 'ville'
,DATEPART(YEAR, [periode]) as [annee]
,CASE
    WHEN GROUPING([item]) = 0 THEN [item]
    ELSE 'ALL'
END 'item'
,SUM([qte]) 'total des ventes'
FROM [tp2-fa].[dbo].[ventes]
GROUP BY CUBE ([ville], DATEPART(YEAR, [periode]), [item]);

```

```

SELECT CASE
    WHEN GROUPING([ville]) = 0 THEN [ville]
    ELSE 'ALL'
END 'ville'
,DATEPART(YEAR, [periode]) as [annee]
,CASE
    WHEN GROUPING([item]) = 0 THEN [item]
    ELSE 'ALL'
END 'item'
,SUM([qte]) 'total des ventes'
FROM [ventes]
GROUP BY CUBE ([ville], DATEPART(YEAR, [periode]), [item]);

```

100 %

	ville	annee	item	total des ventes
1	chicago	2000	Grille-pain	3
2	toronto	2000	Grille-pain	8
3	vancouver	2000	Grille-pain	5
4	ALL	2000	Grille-pain	16
5	ALL	NULL	Grille-pain	16
6	chicago	1999	Micro onde	3
7	toronto	1999	Micro onde	5
8	vancouver	1999	Micro onde	10
9	ALL	1999	Micro onde	18
10	ALL	NULL	Micro onde	18
11	chicago	2000	Mixeur	4
12	toronto	2000	Mixeur	7
13	vancouver	2000	Mixeur	5
14	ALL	2000	Mixeur	16

Question 3 :

On souhaite maintenant regrouper les objets par département (Téléphonie, Informatique et Ménager). Créer la table Items ayant pour attributs IdItem, NomItem, Dept et la peupler à partir de Ventes :

```

SELECT ROW_NUMBER() OVER(ORDER BY [item] DESC) AS 'IdItem', [item] 'NomItem',
CASE
    WHEN [item] = 'Tel. fixe' or [item] = 'Tel. portable' THEN 'Téléphonie'
    WHEN [item] = 'PC bureau' or [item] = 'PC portable' THEN 'Informatique'
    ELSE 'Ménager'
END 'Dept' INTO items
FROM [tp2-fa].[dbo].[ventes]
GROUP BY [item];

```

```
-- > Q3
SELECT ROW_NUMBER() OVER(ORDER BY [item] DESC) AS 'IdItem', [item] 'NomItem',
CASE
    WHEN [item] = 'Tel. fixe' or [item] = 'Tel. portable' THEN 'Téléphonie'
    WHEN [item] = 'PC bureau' or [item] = 'PC portable' THEN 'Informatique'
    ELSE 'Ménager'
END 'Dept' INTO items
FROM [ventes]
GROUP BY [item];
```

100 %

Results Messages

	ville	item	periode	qte
1	chicago	Tel. fixe	1999-01-01	25
2	chicago	Tel. portable	1999-01-01	15
3	chicago	PC bureau	1999-02-01	8
4	chicago	PC portable	1999-02-01	12
5	chicago	Micro onde	1999-03-01	3
6	chicago	Mixeur	2000-02-01	4
7	chicago	Grille-pain	2000-03-01	3
8	toronto	Tel. fixe	1999-02-01	11
9	toronto	Tel. portable	1999-02-01	9
10	toronto	PC bureau	1999-05-01	13
11	toronto	PC portable	1999-06-01	7
12	toronto	Micro onde	1999-01-01	5
13	toronto	Mixeur	2000-01-01	7
14	toronto	Grille-pain	2000-03-01	8

Question 4 :

Construire le cube de données du total des ventes selon les dimensions ville, année et département.

```

SELECT CASE
    WHEN GROUPING([ville]) = 0 THEN [ville]
    ELSE 'ALL'
END 'ville'
,DATEPART(YEAR, [periode]) as [annee]
,CASE
    WHEN GROUPING([Dept]) = 0 THEN [Dept]
    ELSE 'ALL'
END 'Dept'
,SUM([qte]) 'total des ventes'
FROM [tp2-fa].[dbo].[ventes] v, [tp2-fa].[dbo].[items] i
WHERE v.item = i.NomItem
GROUP BY CUBE ([ville], DATEPART(YEAR, [periode]), [Dept]);

```

```
-- > Q4
SELECT CASE
    WHEN GROUPING([ville]) = 0 THEN [ville]
    ELSE 'ALL'
END 'ville'
,DATEPART(YEAR, [periode]) as [annee]
,CASE
    WHEN GROUPING([Dept]) = 0 THEN [Dept]
    ELSE 'ALL'
END 'Dept'
,SUM([qte]) 'total des ventes'
FROM [ventes] v, [items] i
WHERE v.item = i.NomItem
GROUP BY CUBE ([ville], DATEPART(YEAR, [periode]), [Dept]);
SELECT * FROM ventes;
```

	ville	annee	Dept	total des ventes
1	chicago	1999	Informatique	20
2	toronto	1999	Informatique	20
3	vancouver	1999	Informatique	10
4	ALL	1999	Informatique	50
5	ALL	NULL	Informatique	50
6	chicago	1999	Ménager	3
7	toronto	1999	Ménager	5
8	vancouver	1999	Ménager	10

	ville	item	periode	qte
1	chicago	Tel. fixe	1999-01-01	25
2	chicago	Tel. portable	1999-01-01	15
3	chicago	PC bureau	1999-02-01	8
4	chicago	PC portable	1999-02-01	12
5	chicago	Micro onde	1999-03-01	3

Question 5:

Donner le total des ventes par produit et par département selon les dimensions ville et année :

```
SELECT [item], [Dept],
CASE
    WHEN GROUPING([ville]) = 0 THEN [ville]
    ELSE 'ALL'
END 'ville'
,DATEPART(YEAR, [periode]) as [annee]
,SUM([qte]) 'total des ventes'
FROM [tp2-fa].[dbo].[ventes] v, [tp2-fa].[dbo].[items] i
WHERE v.item = i.NomItem
GROUP BY [item], [Dept], CUBE ([ville], DATEPART(YEAR, [periode]));
```

Le résultat est donné par :


```

SELECT [item], [Dept],
       CASE
         WHEN GROUPING([ville]) = 0 THEN [ville]
         ELSE 'ALL'
       END 'ville'
, DATEPART(YEAR, [periode]) as [annee]
, SUM([qte]) 'total des ventes'
FROM [ventes] v, [items] i
WHERE v.item = i.NomItem
GROUP BY [item], [Dept], CUBE ([ville], DATEPART(YEAR, [periode]));
SELECT * FROM ventes;

```

100 %

Results Messages

	item	Dept	ville	annee	total des ventes
1	Grille-pain	Ménager	chicago	2000	3
2	Grille-pain	Ménager	toronto	2000	8
3	Grille-pain	Ménager	vancouver	2000	5
4	Grille-pain	Ménager	ALL	2000	16
5	Grille-pain	Ménager	ALL	NULL	16
6	Micro onde	Ménager	chicago	1999	3
7	Micro onde	Ménager	toronto	1999	5
8	Micro onde	Ménager	vancouver	1999	10

	ville	item	periode	qte
1	chicago	Tel. fixe	1999-01-01	25
2	chicago	Tel. portable	1999-01-01	15
3	chicago	PC bureau	1999-02-01	8
4	chicago	PC portable	1999-02-01	12
5	chicago	Micro onde	1999-03-01	3

■ The end --