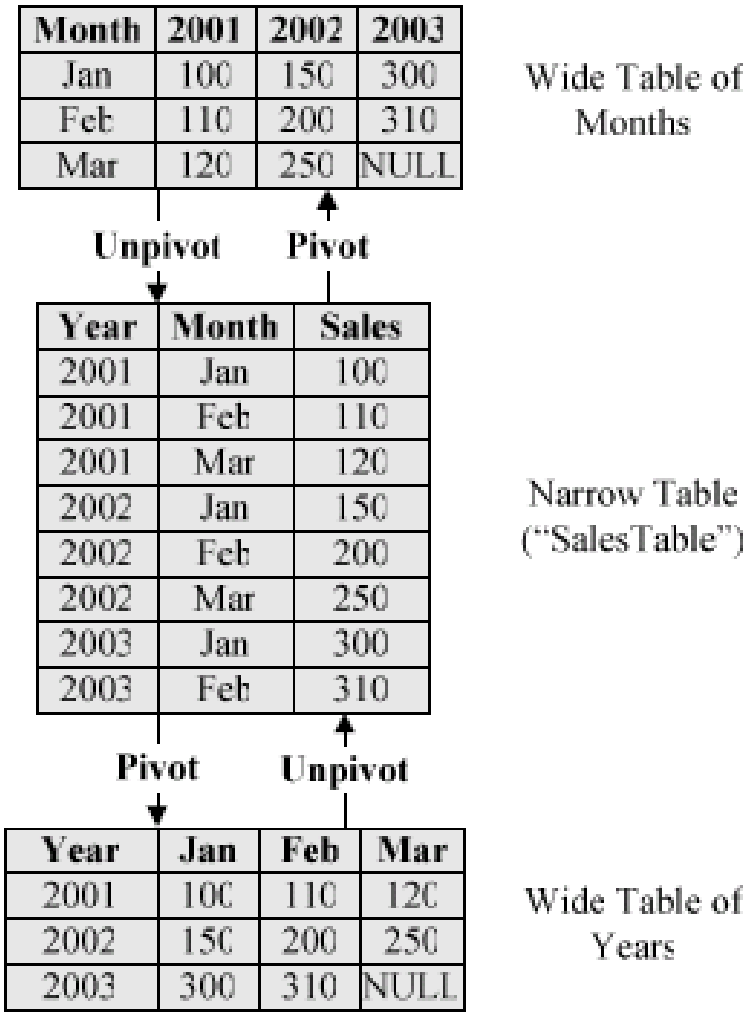
Pivoting

1. Read Section 25.3 @ Textbook
2. Refer to Excel example for Pivoting and Cross-tabbing
3. More on Pivoting in Oracle

Oracle Data Warehousing Guide: Ch 19.4/19.5 Pivoting/Unpivoting in Oracle

https://docs.oracle.com/en/database/oracle/oracle-database/19/dwhsg/sql-analysis-reporting-data-warehouses.html#GUID-20EFBF1E-F79D-4E4A-906C-6E496EECA684

Pivot and Un-pivot



Very Large Data Bases

Pivoting and Un-pivoting in MS SQL Server 2005

Month	2001	2002	2003
Jan	100	150	300
Feb	110	200	310
Mar	120	250	NULL

Wide Table of Months

Unpivot

Pivot

Year	Month	Sales
2001	Jan	100
2001	Feb	110
2001	Mar	120
2002	Jan	150
2002	Feb	200
2002	Mar	250
2003	Jan	300
2003	Feb	310

Narrow Table ("SalesTable")

Pivot

Unpivot

Year	Jan	Feb	Mar
2001	100	110	120
2002	150	200	250
2003	300	310	NULL

Wide Table of Years "SalesReport"

Pivoting

```
SELECT *
FROM (SalesTable PIVOT (Sales for Month IN
                        ('Jan','Feb','Mar'))
```

Un-pivoting

```
SELECT *
FROM (SalesReport UNPIVOT (Sales for Month IN
                           ('Jan','Feb','Mar'))
```

Pivoting and Cross-Tab – Example Data

```
SELECT    job, deptno, count(*)
FROM      emp
GROUP BY  job, deptno
```

JOB	DEPTNO	COUNT(*)
CLERK	10	1
CLERK	20	2
CLERK	30	1
ANALYST	20	2
MANAGER	10	1
MANAGER	20	1
MANAGER	30	1
SALESMAN	30	4
PRESIDENT	10	1

Count	DeptNo			
Job	10	20	30	Subtotal
ANALYST		2		2
CLERK	1	2	1	4
MANAGER	1	1	1	3
PRESIDENT	1			1
SALESMAN			4	4
Subtotal	3	5	6	14

Very Large Data Bases

Pivoting in ANSI SQL

```
SELECT job,
   (select count(*) from emp where deptno = 10 and job = e1.job) as dept_10,
   (select count(*) from emp where deptno = 20 and job = e1.job) as dept_20,
   (select count(*) from emp where deptno = 30 and job = e1.job) as dept_30
FROM emp e1
GROUP BY job
```

JOB	DEPT_10	DEPT_20	DEPT_30
ANALYST	0	2	0
CLERK	1	2	1
MANAGER	1	1	1
PRESIDENT	1	0	0
SALESMAN	0	0	4

Pivoting in Oracle (Before 11g)

```
SELECT job,
          max( decode( deptno, 10, cnt, null ) ) dept_10,
          max( decode( deptno, 20, cnt, null ) ) dept_20,
          max( decode( deptno, 30, cnt, null ) ) dept_30
FROM  (SELECT job, deptno, count(*) cnt  FROM emp GROUP BY job, deptno )
GROUP BY job
```

JOB	DEPTNO	COUNT(*)
CLERK	10	1
CLERK	20	2
CLERK	30	1
ANALYST	20	2
MANAGER	10	1
MANAGER	20	1
MANAGER	30	1
SALESMAN	30	4
PRESIDENT	10	1

JOB	DEPT_10	DEPT_20	DEPT_30
ANALYST		2	
CLERK	1	2	1
MANAGER	1	1	1
PRESIDENT	1		
SALESMAN			4

Cross-tab in Oracle (Before 11g)

```
SELECT  decode(job,NULL, 'SUB_TOTAL', job) JOB,
                    max(decode(deptno, 10, cnt, 0)) DEPTNO_10,
                    max(decode(deptno, 20, cnt, 0)) DEPTNO_20,
                    max(decode(deptno, 30, cnt, 0)) DEPTNO_30,
                    max(decode(deptno, NULL, cnt, 0)) SUB_TOTAL
FROM  (SELECT deptno deptno, job job, count(*) cnt
          FROM emp
          GROUP BY CUBE(deptno, job))
GROUP BY job
```

JOB	DEPTNO_10	DEPTNO_20	DEPTNO_30	SUB_TOTAL
ANALYST	0	2	0	2
CLERK	1	2	1	4
MANAGER	1	1	1	3
PRESIDENT	1	0	0	1
SALESMAN	0	0	4	4
SUB_TOTAL	3	5	6	14

Pivoting in Oracle (Since 11R)

- Pivot operator since 11g R1
  - Syntax

```
SELECT ....
FROM <table-expr> PIVOT ( aggregate-function(<column>) AS <alias>
        FOR <pivot-column> IN (<value1>, <value2>,..., <valuen>)
        ) AS <alias>
WHERE .....
```

  - Example

```
SELECT *
FROM (SELECT job, deptno, count(*) as cnt FROM emp GROUP BY job,
deptno) E PIVOT ( SUM(cnt) FOR deptno IN ( 10 as DEPT10, 20 as DEPT20,
30 as DEPT30) )
ORDER BY job;
```


Very Large Data Bases

Un-Pivoting in Oracle (Since 11R)

- Unpivot

```
CREATE TABLE PivotedTable
AS
SELECT *
FROM (SELECT job, deptno, count(*) as cnt FROM emp GROUP BY job,
deptno) E PIVOT ( SUM(cnt) FOR deptno IN ( 10 as DEPT10, 20 as DEPT20,
30 as DEPT30)
ORDER BY job;
```

```
SELECT  job, DECODE (deptno, 'DEPT10', 10, 'DEPT20', 20, 'DEPT30', 30)
as deptno, cnt
FROM PivotedTable UNPIVOT INCLUDE NULLS (cnt for deptno in (DEPT10,
DEPT20, DEPT30)
ORDER BY job, deptno;
```


Very Large Data Bases