

# Basis Data II



Pertemuan Ke-7  
(*Union dan Join*)

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# Sub Pokok Bahasan

- *OPERATOR UNION*
- *OPERATOR UNION ALL*
- *JOIN TYPE:*
  - *INNER JOIN*
  - *LEFT JOIN*
  - *RIGHT JOIN*

# OPERATOR *UNION*

■ *UNION* = (**A U B**)

■ Aturan Penggunaan:

- klausa *SELECT* dari seluruh blok *select* harus memiliki jumlah ekspresi yang sama, dan hasil ekspresi yang akan ditempatkan dalam kolom yang sama dengan hasil ekspresi yang lainnya harus memiliki tipe data yang sama atau masih dapat ditransformasi menjadi tipe data yang sama
- klausa *ORDER BY* hanya dapat diletakkan setelah blok *select* yang terakhir
- di klausa *SELECT* tidak boleh menggunakan *DISTINCT*; SQL secara otomatis akan menghapus duplikasi baris yang memiliki nilai yang sama

# OPERATOR *UNION* (contd-2)

**Contoh 1:** Cari nomor dan tempat tinggal masing-masing pemain yang berasal dari Inglewood and Plymouth! Urutkan berdasarkan nomor pemain!

Catatan: 'berasal dari Inglewood dan Plymouth' berarti 'berasal dari Inglewood atau dari Plymouth'.

Dengan menggunakan operator UNION:

```
SELECT  PLAYERNO, TOWN
FROM    PLAYERS
WHERE   TOWN = 'Inglewood'
UNION
SELECT  PLAYERNO, TOWN
FROM    PLAYERS
WHERE   TOWN = 'Plymouth'
ORDER BY PLAYERNO;
```

PLAYERNO	TOWN
6	Inglewood
8	Inglewood
44	Inglewood
100	Inglewood
112	Plymouth

Solusi menggunakan operator OR:

```
SELECT  PLAYERNO, TOWN
FROM    PLAYERS
WHERE   TOWN = 'Inglewood'
       OR TOWN = 'Plymouth'
ORDER BY PLAYERNO;
```

# OPERATOR *UNION* (contd-3)

**Contoh 2:** Buatlah daftar dari nomor pemain yang telah melakukan penalti setidaknya sebanyak 1 kali, atau pemain yang menjadi kapten tim atau pemain yang memenuhi kedua kondisi tersebut.

Dengan menggunakan operator UNION:

```
SELECT  PLAYERNO
FROM    PENALTIES
UNION
SELECT  PLAYERNO
FROM    TEAMS;
```

Solusi dengan menggunakan operator OR:

```
SELECT  PLAYERNO
FROM    PLAYERS
WHERE   PLAYERNO IN
        (SELECT  PLAYERNO
         FROM    PENALTIES)
OR
        (SELECT  PLAYERNO
         FROM    TEAMS);
```

# OPERATOR *UNION* (contd-4)

**Contoh 3:** Buatlah daftar nomor pemain dan nomor tim dari para pemain yang menjadi kapten tim atau pemain yang pernah bermain minimal 1 kali dalam suatu pertandingan atau pemain yang memenuhi kedua kondisi tersebut! Urutkan berdasarkan nomor pemain dan nomor tim.

Dengan menggunakan operator UNION:

```
SELECT    PLAYERNO, TEAMNO
FROM      TEAMS
UNION
SELECT    PLAYERNO, TEAMNO
FROM      MATCHES
ORDER BY  PLAYERNO, TEAMNO;
```

Catatan: Untuk permasalahan di atas tidak dapat diselesaikan dengan menggunakan operator OR

# OPERATOR *UNION ALL*

- *UNION ALL* = (**A U B**)
- Perbedaan dengan OPERATOR *UNION*:
  - Duplikasi baris yang memiliki nilai yang sama tidak dihapuskan

**Contoh 4:** Buatlah daftar dari nomor pemain yang telah melakukan penalti setidaknya sebanyak 1 kali, atau pemain yang menjadi kapten tim atau pemain yang memenuhi kedua kondisi tersebut.

*Query:*

```
SELECT    PLAYERNO
FROM      PENALTIES
UNION ALL
SELECT    PLAYERNO
FROM      TEAMS;
```



# *JOIN TYPE*

- INNER JOIN
- OUTER JOIN
  - LEFT JOIN
  - RIGHT JOIN

# *INNER JOIN*

**Contoh 5:** Untuk masing-masing tim, carilah nomor tim dan nama kaptenya!

Solusi menggunakan “Equi JOIN”:

```
SELECT TEAMNO, NAME
FROM PLAYERS P, TEAMS T
WHERE P.PLAYERNO = T.PLAYERNO
```

Solusi menggunakan INNER JOIN:

```
SELECT TEAMNO, NAME
FROM PLAYERS P INNER JOIN TEAMS T
ON (P.PLAYERNO = T.PLAYERNO)
```



# LEFT/RIGHT JOIN

**Contoh 6:** Untuk masing-masing pemain, buatlah daftar nama dan nomor teleponnya (jika memang terdaftar)! Khusus untuk pemain yang menjadi kapten suatu tim, cantumkan juga nomor timnya dan dan divisinya.

Solusi menggunakan **LEFT JOIN**:

```
SELECT  NAME, PHONENO, TEAMNO, DIVISION
FROM    PLAYERS AS P LEFT JOIN TEAMS AS T
        ON P.PLAYERNO = T.PLAYERNO
```

Solusi menggunakan **RIGHT JOIN**:

```
SELECT  NAME, PHONENO, TEAMNO, DIVISION
FROM    TEAMS AS T RIGHT JOIN PLAYERS AS P
        ON T.PLAYERNO = P.PLAYERNO
```

Solusi menggunakan operator **UNION**:

```
SELECT  NAME, PHONENO, TEAMNO, DIVISION
FROM    PLAYERS AS P, TEAMS AS T
WHERE   P.PLAYERNO = T.PLAYERNO
UNION
SELECT  NAME, PHONENO, NULL, NULL
FROM    PLAYERS
WHERE   PLAYERNO NOT IN
        (SELECT PLAYERNO FROM TEAMS);
```

# LEFT/RIGHT JOIN (contd-2)

**Contoh 7:** Untuk seluruh pemain, buatlah daftar nomor pemain, total banyaknya penalti yang telah mereka lakukan dan total jumlah penalti yang harus mereka bayar!

Dengan menggunakan operator **UNION**:

```
SELECT  PLAYERNO, COUNT(*) AS NUMBER_of_PENALTIES,  
        SUM(AMOUNT) AS TOTAL_PENALTIES  
FROM    PENALTIES  
GROUP BY PLAYERNO  
UNION  
SELECT  PLAYERNO, 0, 0.00  
FROM    PLAYERS  
WHERE   PLAYERNO NOT IN  
        (SELECT PLAYERNO FROM PENALTIES)  
ORDER BY 2 DESC;
```

Solusi dengan **JOIN**:

```
SELECT  P.PLAYERNO, COUNT(PAYMENTNO) AS NUMBER_of_PENALTIES,  
        IFNULL (SUM(AMOUNT), 0.00) AS TOTAL_PENALTIES  
FROM    PLAYERS AS P LEFT OUTER JOIN PENALTIES AS PEN  
        ON P.PLAYERNO = PEN.PLAYERNO  
GROUP BY P.PLAYERNO  
ORDER BY 2 DESC;
```

# Cartesian Product

TEAMNO	PLAYERNO	DIVISION
1	6	first
2	27	second

PLAYERNO	NAME	INITIALS	BIRTH_DATE	SEX	JOINED	STREET	HOUSENO	POSTCODE	TOWN	PHONENO	LEAGU
2	Everett	R	1948-09-01	M	1975	Stoney Road	43	3575NH	Stratford	070-237893	2411
6	Parmenter	R	1964-06-25	M	1977	Haseltine Lane	80	1234KK	Stratford	070-476537	8467
7	Wise	GWS	1963-05-11	M	1981	Edgecombe Way	39	9758VB	Stratford	070-347689	
8	Newcastle	B	1962-07-08	F	1980	Station Road	4	6584WO	Inglewood	070-458458	2983
27	Collins	DD	1964-12-28	F	1983	Long Drive	804	8457DK	Eltham	079-234857	2513

## CARTESIAN PRODUCT

TEAMNO	PLAYERNO	DIVISION	PLAYERNO	NAME	INITIALS	BIRTH_DATE	SEX	JOINED	STREET	HOUSENO	POSTCODE
1	6	first	2	Everett	R	1948-09-01	M	1975	Stoney Road	43	3575NH
1	6	first	6	Parmenter	R	1964-06-25	M	1977	Haseltine Lane	80	1234KK
1	6	first	7	Wise	GWS	1963-05-11	M	1981	Edgecombe Way	39	9758VB
1	6	first	8	Newcastle	B	1962-07-08	F	1980	Station Road	4	6584WO
1	6	first	27	Collins	DD	1964-12-28	F	1983	Long Drive	804	8457DK
2	27	second	2	Everett	R	1948-09-01	M	1975	Stoney Road	43	3575NH
2	27	second	6	Parmenter	R	1964-06-25	M	1977	Haseltine Lane	80	1234KK
2	27	second	7	Wise	GWS	1963-05-11	M	1981	Edgecombe Way	39	9758VB
2	27	second	8	Newcastle	B	1962-07-08	F	1980	Station Road	4	6584WO
2	27	second	27	Collins	DD	1964-12-28	F	1983	Long Drive	804	8457DK

TEAMNO	PLAYERNO	DIVISION	PLAYERNO	NAME	INITIALS	BIRTH_DATE	SEX	JOINED	STREET	HOUSENO	POSTCODE
1	6	first	2	Everett	R	1948-09-01	M	1975	Stoney Road	43	3575NH
1	6	first	6	Parmenter	R	1964-06-25	M	1977	Haseltine Lane	80	1234KK
1	6	first	7	Wise	GWS	1963-05-11	M	1981	Edgecombe Way	39	9758VB
1	6	first	8	Newcastle	B	1962-07-08	F	1980	Station Road	4	6584WO
1	6	first	27	Collins	DD	1964-12-28	F	1983	Long Drive	804	8457DK
2	27	second	2	Everett	R	1948-09-01	M	1975	Stoney Road	43	3575NH
2	27	second	6	Parmenter	R	1964-06-25	M	1977	Haseltine Lane	80	1234KK
2	27	second	7	Wise	GWS	1963-05-11	M	1981	Edgecombe Way	39	9758VB
2	27	second	8	Newcastle	B	1962-07-08	F	1980	Station Road	4	6584WO
2	27	second	27	Collins	DD	1964-12-28	F	1983	Long Drive	804	8457DK

```

SELECT TEAMNO, NAME
FROM TEAMS INNER JOIN PLAYERS
ON (TEAMS.PLAYERNO = PLAYERS.PLAYERNO)

```

TEAMNO	NAME
1	Parmenter
2	Collins



## KAPAN MENGGUNAKAN:

- UNION
- JOIN



# Populasi *EQUAL*

## Tabel PLAYERS

<u>PLAYERNO</u>	<u>TOWN</u>
6	Stratford
44	Inglewood
104	Elthan

## Tabel PENALTIES

<u>PLAYERNO</u>	<u>AMOUNT</u>
6	100
44	75
44	25
44	30
104	50

## Hasil INNER JOIN:

<u>PLAYERNO</u>	<u>TOWN</u>	<u>AMOUNT</u>
6	Stratford	100
44	Inglewood	75
44	Inglewood	25
44	Inglewood	30
104	Elthan	50

```
SELECT P.PLAYERNO, TOWN, AMOUNT
FROM PLAYERS P INNER JOIN PENALTIES PE
ON (P.PLAYERNO = PE.PLAYERNO)
```

# Populasi *SUBSET*

## Tabel PLAYERS

PLAYERNO	TOWN
6	Stratford
44	Inglewood
104	Elthan

## Tabel PENALTIES

PLAYERNO	AMOUNT
6	100
104	50

## Hasil INNER JOIN:

PLAYERNO	TOWN	AMOUNT
6	Stratford	100
104	Elthan	50

## Hasil UNION atau OUTER JOIN (LEFT/RIGHT):

PLAYERNO	TOWN	AMOUNT
6	Stratford	100
104	Elthan	50
44	Inglewood	0

```
SELECT P.PLAYERNO, TOWN, AMOUNT
FROM PLAYERS P LEFT JOIN PENALTIES PE
ON (P.PLAYERNO = PE.PLAYERNO)
```

```
SELECT P.PLAYERNO, TOWN, AMOUNT
FROM PLAYERS P, PENALTIES AS PE
WHERE P.PLAYERNO = PE.PLAYERNO
UNION
SELECT P.PLAYERNO, TOWN, 0
FROM PLAYERS
WHERE PLAYERNO NOT IN
(SELECT PLAYERNO
FROM PENALTIES)
```

# Populasi *CONJOINT*

## Tabel PLAYERS

PLAYERNO	TOWN
6	Stratford
44	Inglewood
104	Elthan

## Tabel PENALTIES

PLAYERNO	AMOUNT
6	100
104	50
8	25

## Hasil INNER JOIN:

PLAYERNO	TOWN	AMOUNT
6	Stratford	100
104	Elthan	50

```
SELECT P.PLAYERNO, TOWN, AMOUNT
FROM PLAYERS P, PENALTIES AS PE
WHERE P.PLAYERNO = PE.PLAYERNO
UNION
SELECT P.PLAYERNO, TOWN, 0
FROM PLAYERS
WHERE PLAYERNO NOT IN
(SELECT PLAYERNO
FROM PENALTIES)
```

## Hasil UNION:

PLAYERNO	TOWN	AMOUNT
6	Stratford	100
104	Elthan	50
44	Inglewood	0
8	?	25

```
UNION
SELECT P.PLAYERNO, NULL, AMOUNT
FROM PENALTIES
WHERE PLAYERNO NOT IN
(SELECT PLAYERNO
FROM PLAYERS)
```

# Populasi *DISJOINT*

## Tabel PLAYERS

PLAYERNO	TOWN
6	Stratford
44	Inglewood
104	Elthan

## Tabel PENALTIES

PLAYERNO	AMOUNT
27	100
8	25
27	75

## Hasil UNION:

PLAYERNO	TOWN	AMOUNT
6	Stratford	0
44	Elthan	0
104	Eeltham	0
27	-	100
8	-	25
27	-	75

```
SELECT P.PLAYERNO, TOWN, 0 AS AMOUNT
FROM PLAYERS
UNION
SELECT PLAYERNO, '-', AMOUNT
FROM PENALTIES
```



KAPAN MENGGUNAKAN:

- UNION
- JOIN



**CEK RELASI  
ANTARA TABEL/KOLOM  
YANG AKAN DI-JOIN!**

<u>T1 C</u>	<u>T2 C</u>	<u>T3 C</u>	<u>T4 C</u>
1	2	?	?
2	3	2	2
3	4		3

**Cobalah tentukan hasil dari query berikut:**

1. **SELECT T1.C, T2.C  
FROM T1 INNER JOIN T2 ON (T1.C = T2.C)**
2. **SELECT T1.C, T2.C  
FROM T1 LEFT JOIN T2 ON (T1.C = T2.C)**
3. **SELECT T1.C, T2.C  
FROM T1 RIGHT JOIN T2 ON (T1.C = T2.C)**
4. **SELECT T1.C, T3.C  
FROM T1 RIGHT JOIN T3 ON (T1.C = T3.C)**
5. **SELECT T1.C, T3.C  
FROM T1 LEFT JOIN T3 ON (T1.C = T3.C)**
6. **SELECT T3.C, T4.C  
FROM T3 LEFT JOIN T4 ON (T3.C = T4.C)**
7. **SELECT T3.C, T4.C  
FROM T3 RIGHT JOIN T4 ON (T3.C = T4.C)**