

Renommer une colonne

AS

- `SELECT column1 AS myColumn1 ... FROM myTable;`

```
SELECT location AS place , rating FROM doughnut_ratings;
```

```
+-----+-----+
| place           | rating |
+-----+-----+
| Krispy King     |    10 |
| Duncan's Donuts |     6 |
| Starbuzz Coffee |     5 |
| Duncan's Donuts |     7 |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time   | date     | type           | rating | comments     |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed   | 10     | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL           | 6     | greasy         |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5     | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly          | 7     | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Ajouter des conditions

WHERE

- **SELECT ... FROM *myTable* WHERE *myCondition*;**
- On définit un sous ensemble des éléments de la table en compréhension.
- On effectue éventuellement ensuite une projection.

```
SELECT location ,type FROM doughnut_ratings  
WHERE location='Duncan\'s Donuts';
```

- Le caractère ' délimite une chaîne de caractères.
- Dans une requête, pour le représenter à l'intérieur d'une chaîne de caractères, on doit l'échapper avec \ '.

```
+-----+-----+  
| location          | type |  
+-----+-----+  
| Duncan's Donuts  | NULL |  
| Duncan's Donuts  | jelly|  
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+  
| location          | time    | date        | type           | rating | comments          |  
+-----+-----+-----+-----+-----+-----+  
| Krispy King       | 08:50:00 | 2007-09-27 | plain glazed   | 10     | almost perfect    |  
| Duncan's Donuts   | 08:59:00 | 2007-08-25 | NULL           | 6      | greasy             |  
| Starbuzz Coffee   | 07:35:00 | 2007-05-24 | cinnamon cake | 5      | stale, but tasty  |  
| Duncan's Donuts   | 07:03:00 | 2007-04-26 | jelly          | 7      | not enough jelly  |  
+-----+-----+-----+-----+-----+-----+
```

Opérateurs de comparaison

Opérateur	Test
=	égalité
<>	n'est pas égal
<	strictement inférieur
<=	inférieur ou égal
>	strictement supérieur
>=	supérieur ou égal

- Ces opérateurs sont utilisables avec la plupart des types de données SQL.
- Les chaînes de caractères :
 - sont ordonnées en utilisant l'ordre alphabétique.
 - Par défaut, MySQL ne tient pas compte de la casse (minuscule/majuscule).
 - On définit avec la collation, si on veut tenir compte de la casse dans le tri.

Exemples de comparaison (1)

```
SELECT location , rating FROM doughnut_ratings
WHERE rating > 6;
```

```
+-----+-----+
| location      | rating |
+-----+-----+
| Krispy King   |      10 |
| Duncan's Donuts |      7 |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time    | date    | type          | rating | comments      |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed  |      10 | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL          |      6 | greasy         |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake |      5 | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly         |      7 | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Exemples de comparaison (2)

```
SELECT location , date FROM doughnut_ratings
WHERE date < '2007-06-01' ;
```

```
+-----+-----+
| location           | date       |
+-----+-----+
| Starbuzz Coffee   | 2007-05-24 |
| Duncan's Donuts   | 2007-04-26 |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location     | time       | date       | type           | rating | comments           |
+-----+-----+-----+-----+-----+-----+
| Krispy King  | 08:50:00   | 2007-09-27 | plain glazed   | 10     | almost perfect    |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL           | 6      | greasy             |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5      | stale, but tasty  |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly          | 7      | not enough jelly  |
+-----+-----+-----+-----+-----+-----+
```

Exemples de comparaison (3)

```
SELECT location , type FROM doughnut_ratings
WHERE location <> 'Duncan\'s Donuts';
```

```
+-----+-----+
| location          | type          |
+-----+-----+
| Krispy King       | plain glazed  |
| Starbuzz Coffee   | cinnamon cake|
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location          | time         | date       | type          | rating | comments          |
+-----+-----+-----+-----+-----+-----+
| Krispy King       | 08:50:00    | 2007-09-27 | plain glazed  | 10     | almost perfect   |
| Duncan's Donuts   | 08:59:00    | 2007-08-25 | NULL          | 6      | greasy            |
| Starbuzz Coffee   | 07:35:00    | 2007-05-24 | cinnamon cake | 5      | stale, but tasty |
| Duncan's Donuts   | 07:03:00    | 2007-04-26 | jelly         | 7      | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```


Exemples de comparaison (4)

```
SELECT location ,type FROM doughnut_ratings
WHERE location >= 'L';
```

```
+-----+-----+
| location      | type          |
+-----+-----+
| Starbuzz Coffee | cinnamon cake |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

location	time	date	type	rating	comments
Krispy King	08:50:00	2007-09-27	plain glazed	10	almost perfect
Duncan's Donuts	08:59:00	2007-08-25	NULL	6	greasy
Starbuzz Coffee	07:35:00	2007-05-24	cinnamon cake	5	stale, but tasty
Duncan's Donuts	07:03:00	2007-04-26	jelly	7	not enough jelly

Tester si une valeur vaut NULL

```
SELECT location , date FROM doughnut_ratings
WHERE type IS NULL;
```

```
+-----+-----+
| location      | date      |
+-----+-----+
| Duncan's Donuts | 2007-08-25 |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time      | date      | type      | rating | comments |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed | 10 | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL      | 6 | greasy |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5 | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly     | 7 | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Chercher dans un intervalle

BETWEEN

- **SELECT ... FROM myTable WHERE myAttribute BETWEEN value1 AND value2 ;**
- Les bornes sont inclusives.
- Les bornes sont ordonnées, $value1 \leq value2$.

```
SELECT location ,date FROM doughnut_ratings
WHERE date BETWEEN '2007-05-24' AND '2007-09-27' ;
```

```
+-----+-----+
| location          | date          |
+-----+-----+
| Krispy King       | 2007-09-27   |
| Duncan's Donuts  | 2007-08-25   |
| Starbuzz Coffee  | 2007-05-24   |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location    | time         | date          | type          | rating | comments      |
+-----+-----+-----+-----+-----+-----+
| Krispy King | 08:50:00    | 2007-09-27   | plain glazed  | 10    | almost perfect |
| Duncan's Donuts | 08:59:00    | 2007-08-25   | NULL          | 6     | greasy         |
| Starbuzz Coffee | 07:35:00    | 2007-05-24   | cinnamon cake | 5     | stale, but tasty |
| Duncan's Donuts | 07:03:00    | 2007-04-26   | jelly         | 7     | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Chercher les valeurs dans un ensemble de valeurs

IN

- **SELECT ... FROM *myTable* WHERE *myAttribute* IN (*value1,value1,...,valueN*);**

```
SELECT location ,rating FROM doughnut_ratings
WHERE rating IN (2,4,6);
```

```
+-----+-----+
| location      | rating |
+-----+-----+
| Duncan's Donuts |      6 |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time      | date      | type          | rating | comments      |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed  | 10    | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL         | 6     | greasy         |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5     | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly        | 7     | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Rechercher un motif

LIKE

- **SELECT ... FROM myTable WHERE myAttribute LIKE myPattern;**
- Le symbole `_` représente un caractère.
- Le symbole `%` représente une chaîne de caractères éventuellement vide.

```
SELECT location , comments FROM doughnut_ratings
WHERE comments LIKE '%enough%'
```

```
+-----+-----+
| location          | comments          |
+-----+-----+
| Duncan's Donuts  | not enough jelly |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location    | time    | date    | type    | rating | comments    |
+-----+-----+-----+-----+-----+-----+
| Krispy King | 08:50:00 | 2007-09-27 | plain glazed | 10 | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL      | 6 | greasy        |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5 | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly     | 7 | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Exemples de recherche de motif (2)

```
SELECT location , comments FROM doughnut_ratings
WHERE comments LIKE 'not%';
```

```
+-----+-----+
| location          | comments          |
+-----+-----+
| Duncan's Donuts  | not enough jelly |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time      | date      | type          | rating | comments          |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed  | 10     | almost perfect   |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL          | 6      | greasy           |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5      | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly         | 7      | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Exemples de recherche de motif (3)

```
SELECT location ,comments FROM doughnut_ratings
WHERE comments LIKE ' _r%';
```

```
+-----+-----+
| location      | comments |
+-----+-----+
| Duncan's Donuts | greasy   |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time     | date     | type         | rating | comments |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed | 10     | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL         | 6      | greasy       |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5      | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly        | 7      | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Combiner des conditions avec les opérateurs logiques

Opérateur	Signification
AND	ET
OR	OU
XOR	OU exclusif (spécifique MySQL)
NOT	négation

- On note **F** pour False et **T** pour True.
- Les tables du calcul booléen :

AND	F	T
F	F	F
T	F	T

OR	F	T
F	F	T
T	T	T

XOR	F	T
F	F	T
T	T	F

NOT	F	T
	T	F

Les propriétés de l'algèbre de Boole (1)

Algèbre de Boole à deux éléments

({F, T}, AND, OR, NOT)

Propriétés

Soit x une variable booléenne à valeurs dans $\{F, T\}$.

- Involution :
 $\text{NOT}(\text{NOT}(x)) = x$
- Idempotence :
 $x \text{ OR } x = x$
 $x \text{ AND } x = x$
- Complémentarité :
 $x \text{ AND } \text{NOT}(x) = \mathbf{F}$
 $x \text{ OR } \text{NOT}(x) = \mathbf{T}$
- Éléments neutres :
 $x \text{ AND } \mathbf{T} = \mathbf{T} \text{ AND } x = x$
 $x \text{ OR } \mathbf{F} = \mathbf{F} \text{ OR } x = x$
- Éléments absorbants :
 $x \text{ OR } \mathbf{T} = \mathbf{T} \text{ OR } x = \mathbf{T}$
 $x \text{ AND } \mathbf{F} = \mathbf{F} \text{ AND } x = \mathbf{F}$

Les propriétés de l'algèbre de Boole (2)

Propriétés (suite)

Soient x , y et z des variables booléennes à valeurs dans $\{F, T\}$.

- Associativité :
 $(x \text{ AND } y) \text{ AND } z = x \text{ AND } (y \text{ AND } z)$
 $(x \text{ OR } y) \text{ OR } z = x \text{ OR } (y \text{ OR } z)$
- Distributivité :
 $x \text{ AND } (y \text{ OR } z) = (x \text{ AND } y) \text{ OR } (x \text{ AND } z)$
 $x \text{ OR } (y \text{ AND } z) = (x \text{ OR } y) \text{ AND } (x \text{ OR } z)$
- Lois de Morgan :
 $\text{NOT}(x \text{ AND } y) = \text{NOT}(x) \text{ OR } \text{NOT}(y)$
 $\text{NOT}(x \text{ OR } y) = \text{NOT}(x) \text{ AND } \text{NOT}(y)$

Exemple d'utilisation de l'opérateurs AND

```
SELECT location ,time ,rating FROM doughnut_ratings
WHERE time > '08:00:00' AND rating < 8;
```

```
+-----+-----+-----+
| location      | time      | rating |
+-----+-----+-----+
| Duncan's Donuts | 08:59:00 | 6      |
+-----+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time      | date      | type          | rating | comments |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed | 10     | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL         | 6      | greasy |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5      | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly        | 7      | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Exemple d'utilisation de l'opérateurs OR

```
SELECT location , time , rating FROM doughnut_ratings
WHERE time < '08:00:00' OR rating < 8;
```

```
+-----+-----+-----+
| location          | time          | rating |
+-----+-----+-----+
| Duncan's Donuts  | 08:59:00     | 6      |
| Starbuzz Coffee  | 07:35:00     | 5      |
| Duncan's Donuts  | 07:03:00     | 7      |
+-----+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location          | time          | date          | type          | rating | comments          |
+-----+-----+-----+-----+-----+-----+
| Krispy King       | 08:50:00     | 2007-09-27    | plain glazed  | 10     | almost perfect   |
| Duncan's Donuts  | 08:59:00     | 2007-08-25    | NULL          | 6      | greasy           |
| Starbuzz Coffee  | 07:35:00     | 2007-05-24    | cinnamon cake | 5      | stale, but tasty |
| Duncan's Donuts  | 07:03:00     | 2007-04-26    | jelly         | 7      | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Exemples d'utilisation des opérateurs logiques AND et OR à la fois

```
SELECT location , time , rating , type FROM doughnut_ratings
WHERE (time < '08:00:00' AND rating < 8)
OR type IS NULL;
```

location	time	rating	type
Duncan's Donuts	08:59:00	6	NULL
Starbuzz Coffee	07:35:00	5	cinnamon cake
Duncan's Donuts	07:03:00	7	jelly

```
mysql> SELECT * FROM doughnut_ratings;
```

location	time	date	type	rating	comments
Krispy King	08:50:00	2007-09-27	plain glazed	10	almost perfect
Duncan's Donuts	08:59:00	2007-08-25	NULL	6	greasy
Starbuzz Coffee	07:35:00	2007-05-24	cinnamon cake	5	stale, but tasty
Duncan's Donuts	07:03:00	2007-04-26	jelly	7	not enough jelly

Exemples de NOT (1)

```
SELECT location , rating FROM doughnut_ratings
WHERE NOT rating < 7;
```

```
+-----+-----+
| location      | rating |
+-----+-----+
| Krispy King   |      10 |
| Duncan's Donuts |      7 |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time    | date      | type          | rating | comments      |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed  |      10 | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL          |      6 | greasy         |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake |      5 | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly         |      7 | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Exemples de NOT (2)

```
SELECT location ,time FROM doughnut_ratings
WHERE NOT time BETWEEN '07:35:00' AND '08:00:00';
```

```
+-----+-----+
| location          | time          |
+-----+-----+
| Krispy King       | 08:50:00     |
| Duncan's Donuts   | 08:59:00     |
| Duncan's Donuts   | 07:03:00     |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location          | time          | date          | type          | rating | comments          |
+-----+-----+-----+-----+-----+-----+
| Krispy King       | 08:50:00     | 2007-09-27   | plain glazed  | 10    | almost perfect   |
| Duncan's Donuts   | 08:59:00     | 2007-08-25   | NULL          | 6     | greasy            |
| Starbuzz Coffee   | 07:35:00     | 2007-05-24   | cinnamon cake | 5     | stale, but tasty |
| Duncan's Donuts   | 07:03:00     | 2007-04-26   | jelly         | 7     | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Exemples de NOT (3)

```
SELECT location ,rating FROM doughnut_ratings
WHERE rating NOT IN (2,5,6);
```

```
+-----+-----+
| location      | rating |
+-----+-----+
| Krispy King   |      10 |
| Duncan's Donuts |      7 |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time    | date    | type          | rating | comments          |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed  |      10 | almost perfect   |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL          |      6 | greasy           |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake |      5 | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly         |      7 | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```


Exemples de NOT (4)

```
SELECT location FROM doughnut_ratings
WHERE location NOT LIKE 'D%';
```

```
+-----+
| location      |
+-----+
| Krispy King   |
| Starbuzz Coffee |
+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time      | date      | type      | rating | comments |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed | 10 | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL      | 6 | greasy |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5 | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly     | 7 | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Tester si une valeur n'est pas NULL

```
SELECT location ,date FROM doughnut_ratings
WHERE type IS NOT NULL;
```

```
+-----+-----+
| location      | date      |
+-----+-----+
| Krispy King   | 2007-09-27 |
| Starbuzz Coffee | 2007-05-24 |
| Duncan's Donuts | 2007-04-26 |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time      | date      | type      | rating | comments      |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed | 10 | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL      | 6 | greasy      |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5 | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly     | 7 | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```

Union de deux ensembles

 $A \cup B$

$$A \cup B = \{x \in A \text{ OU } x \in B\}$$

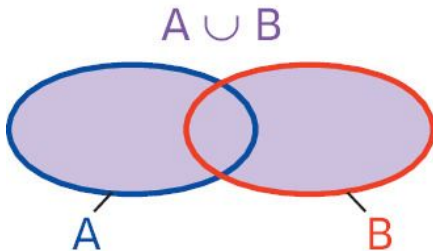


image provenant de <https://manuelnumeriquemax.belin.education/mathematiques-premiere/topics/simple/math1-logique-309-04>

[//manuelnumeriquemax.belin.education/mathematiques-premiere/topics/simple/math1-logique-309-04](https://manuelnumeriquemax.belin.education/mathematiques-premiere/topics/simple/math1-logique-309-04)

Intersection de deux ensembles

 $A \cap B$

$$A \cap B = \{x \in A \text{ ET } x \in B\}$$

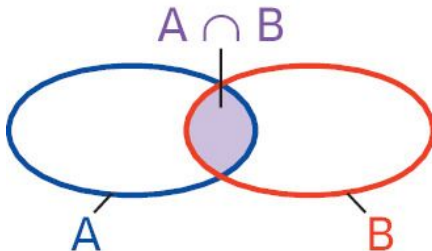


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Différence de deux ensembles

 $A - B$

$$A - B = \{x \in A \text{ ET } x \notin B\}$$

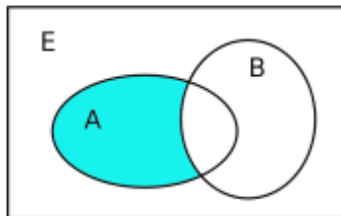


image provenant de

<http://xristal.mi.parisdescartes.fr/res/CoursWeb.eWeb/co/ensembles-differences.html>

Différence symétrique de deux ensembles

$$A \Delta B$$

$$A \Delta B = \{x \in A \cup B \text{ ET } x \notin A \cap B\}$$

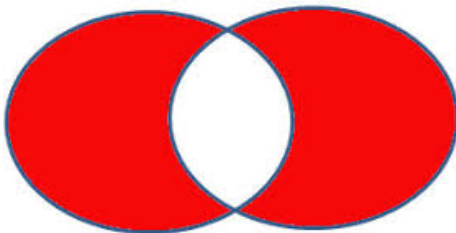


image provenant de

<http://www.math15minutes.fr/comprendre-la-difference-symetrique-de-deux-ensembles/>

Avec SQL, on peut effectuer des opérations ensemblistes sur le résultat des requêtes.

- Union : **UNION**
- Union en gardant les répétitions : **UNION ALL**
- Intersection : **INTERSECT** (n'existe pas sous MySQL)
- Différence : **EXCEPT** (n'existe pas sous MySQL)

Ces opérations imposent des contraintes :

- Les résultats des différents **SELECT**s doivent tous avoir le même nombre de colonnes.
- Les types des colonnes des **SELECT**s doivent être les mêmes pour tous les **SELECT**s.
- Les alias pour les colonnes sont définis dans le premier **SELECT**, le **ORDER BY** dans le dernier **SELECT**.

RÉUNION

UNION

- `SELECT ... UNION SELECT ...;`

```
SELECT location ,rating FROM doughnut_ratings WHERE rating=5
UNION
SELECT location ,rating FROM doughnut_ratings WHERE rating=6;
```

```
+-----+-----+
| location      | rating |
+-----+-----+
| Starbuzz Coffee |      5 |
| Duncan's Donuts |      6 |
+-----+-----+
```

```
mysql> SELECT * FROM doughnut_ratings;
```

```
+-----+-----+-----+-----+-----+-----+
| location      | time    | date      | type         | rating | comments      |
+-----+-----+-----+-----+-----+-----+
| Krispy King   | 08:50:00 | 2007-09-27 | plain glazed | 10     | almost perfect |
| Duncan's Donuts | 08:59:00 | 2007-08-25 | NULL         | 6      | greasy         |
| Starbuzz Coffee | 07:35:00 | 2007-05-24 | cinnamon cake | 5      | stale, but tasty |
| Duncan's Donuts | 07:03:00 | 2007-04-26 | jelly        | 7      | not enough jelly |
+-----+-----+-----+-----+-----+-----+
```